# Uttarakhand Open University, Haldwani

MS 109

## School of Management Studies and Commerce

**Financial Management**


Block I Introduction to Financial Management

Block II Financing Decisions

**MS 109**

# Financial Management

**Block – I**
**Block Title- Introduction to Financial Management**
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# Block I
# Introduction to Financial Management

# UNIT 1INTRODUCTION TO FINANCIAL MANAGEMENT



## 1.1 INTRODUCTION

Finance is the foundational layer on which businesses are setup and run. Access to finances can enable a firm to expand and grow. Similarly, lack of funding can lead to restrained operations and in extreme cases cause a financial collapse of the business altogether. Irrespective of the nature of business, finance is a critical resource which needs to be managed efficiently for a smooth and successful running of companies and markets. Financial management is the process by which a firm creates and implements a financial system which enables it to achieve its goals and drive shareholder value via optimum resource utilisation and deployment in various asset classes.

## 1.2 OBJECTIVES

The objective of this unit on financial management is to educate potential managers to the basic tenets of financial theory, various terminologies often used in the area such that they are able to make informed decisions relating to investments and finance. After reading this unit the learners will be able to;

- Appreciate concepts like risk-return trade off, liquidity and cash flow, time value of money, performance management etc.
- Comprehend the elements of financial management and their relative importance in varied scenarios.
- Understand the approaches to financial management.
- Differentiate between accounting and financial management.
- Know the finance function and the role of a finance manager.

## 1.3 WHAT IS FINANCIAL MANAGEMENT?

Financial management is a management function which encompasses the planning, sourcing, deploying and controlling of the financial resources of a firm. In many companies, financial management is nested inside the accounts and finance function and vice versa, due to which it is often confused with accounting. Financial management concerns itself with raising long term and short term capital, investing or deploying it efficiently, asset – liability management, strategic financial planning, performance management etc.

Funds are an important resource for conducting any business activity whether it is day to day operations, expansion projects, inorganic growth etc. Finance is tightly woven in all business decisions and plays a crucial role in the prioritisation of conflicting business goals. Situations of tight financial control warrant different strategies to survive and grow, whereas situations of abundant finance spur several new projects and programs within the company. Infact strategic planning is incomplete without incorporating a strategic financial management plan. Financial management can be seen operating at different levels in an organisation as depicted in the figure below.


**Fig 1.1 Levels of Financial Management**

**Operational Level –** Financial management at the operational level requires managing the firm's routine financial requirements like working capital, cash flow, repayments, costs etc. This level closely interacts within all the functions including accounts, production, sales etc to manage the financial flows with the company on a day-to-day level.

**Managerial Level –** This level provides a layer of planning, executing and control over the finance function and aligns it with the top management expectations. It provides a critical level of governance and supervision to the smooth functioning of the organisation.

**Strategic Level –** The strategic importance of financial management has only been recently acknowledged by businesses. The role of the CFO has got enhanced equivalent to the other business function heads participating in the strategic planning and management of an enterprise. Many CFO offices are supported by a strategic finance team which deals with strategic activities like mergers, acquisitions, large investments in expansion of markets, strategic investor relationships etc.

Not all organisations cover all the above levels of financial management. Nature of business, size of operations, its complexity, ambitions of the top management and the phase of the business are some of the parameters which determine the scope of financial management in firms. For example a small mature firm in manufacturing garments would mostly have the accounts and finance function rolled into one and working at the operational level whereas a similar size startup in the field of fintech may have even a strategic financial advisor to align the financing requirements with the growth ambitions of the new company. Therefore, it is

essential for a student aspiring to enter the world of finance to appreciate the entire gamut of financial management, its key functions, measurement areas etc.

## 1.4 OBJECTIVES OF FINANCIAL MANAGEMENT

Financial management refers to the application of finance and management principles to plan, organise and direct the financial aspects of an organisation. It typically has the following objectives:

- Maintain a healthy level of funding in the firm for both short-term and long-term requirements
- Achieve high shareholder returns
- Create sound investment opportunities
- Ensure optimum utilisation of funds at the lowest cost
- Manage the financial risk profile of the firm within acceptable levels

The main elements of financial management are

1. Planning – Financial planning requires estimation of a firms short-term and long-term requirements and ensuring availability of the funds at the appropriate time and in the right manner
2. Controlling – Financial control is a monitoring and optimising element of financial management with the objective of efficient resource utilisation in the company
3. Decision-Making – Financial decision-making is the most crucial and ultimate goal of financial management covering areas of investment, financing and shareholder returns. These will be covered in detail in the next couple of sections.

Examples of the kind of decisions which need to be made by finance managers are:

- Whether the company to invest into modernisation of its plant and machinery?
- Whether company should issue debentures or take a bank loan for funding a project?
- What are the working capital requirements of the company and how can they be optimised with respect to value and cost?
- Is the company generating sufficient return on capital?

# 1.5 APPROACHES TO FINANCIAL MANAGEMENT

We have seen above that financial management covers the entire gamut of an organisation from operational level to strategic level. This scenario has evolved over a period of time in business management theory and financial management has two main approaches:

1. Traditional Approach
2. Modern Approach

## 1.5.1 TRADITIONAL APPROACH

The traditional approach to financial management can also be referred in the context of corporate finance as used in many firms. As the name suggests it posits that financial management is primarily about procuring adequate finances for the firm to operate and grow in the form of capital, project finance etc. Traditional methods of financing are generally used in this approach led by bank financing in the form of loans, funded & non-funded limits, market financing in the form of debt and equity instruments, financial institution financing in the form of long-term project finance etc. The function of corporate finance in this approach is very event driven and is dependent on the financial requirements of the other business functions or the promoters with little say in the actual deployment, allocation and end-use of those funds. This approach is still practiced in many firms even today even though it suffers from some limitations as given below.

1. Outside-oriented approach – The activities of financial management in the traditional approach revolve primarily around raising capital from external sources such as banks and markets which makes this a very outside-oriented approach. Maintaining working relationships with these entities, managing the perception of the firm and aligning with the overall market scenario are key determinants in such an approach. The finance function is quite detached from the internal working of the firm.
2. Event-driven engagement – Traditional approach is largely event driven. It is required when the firm needs capital say for setting up a new facility or acquiring another business etc. This again isolates the financial management activity from the day-to-day activity and goals of the company.

Thus, the traditional approach is not very suitable in the current business climate which is characterised by lot of inter-dependencies, complexity and uncertainty of business operations. Innovative financial instruments, access to advanced analytics to manage and improve performance and decision-making are easily available to finance managers today. Simply disengaging finance with day-to-day working or with strategic planning is not the ideal way to run a business. Having said that this approach is still followed by companies especially the smaller well-established promoter-driven businesses. However, majority of the organisations today follow the modern approach as explained below.

## 1.5.2MODERN APPROACH

As stated earlier, the current business climate is quite complex with an interplay of internal and external factors impacting the organisational performance. Students will cover these in detail in the unit on environmental management (part of strategic management). Suffice to mention here that the firms today are operating in a very tightly integrated environment, facing competition from traditional and non-traditional sources and are constantly under threat of technological disruption. A Yale University study has found that, the average lifespan of an organisation in USA has decreased from 67 years in the 1920's to about 15 years in the 2000's.

Thus, in the current context optimum level of efficiencies and resource optimisation including financial resources are a necessary element of survival. Financial performance management has risen from corporate financing to a managerial and strategic level in organisations. This is the modern approach to financial management. It is a broader approach signifying an inter-relationship of finance as a critical resource driving and impacting other business functions whether marketing, production, technology or human resources. It also sees a place in the strategic planning process in determining the right capital structure, risk management, asset allocation, maximising profitability etc. Financial management in many firms has become a profit-centre with its own goals and targets. This modern approach heavily leverages data and analytics as its core driving engines. Multiple scenario analysis, forecasting, balance scorecard are some of the tools used in financial management today. Thus, the role of the finance manager or director requires not only an astute knowledge of finance, but also other skills such as administrative and management skills, strategic thinking, critical thinking and decision-making.

## 1.5.3 LONG-TERM AND SHORT-TERM APPROACH

Another approach to financial management is to bucket the activities into long-term and short-term. The decisions, tools and techniques of long-term vary with those of short-term. For example, capital investment or budgeting is typically a long-term activity requiring tools like project finance, net present value (NPV) of investment options, uncertainty assessment etc. The decisions to be taken in such an activity would be asset allocation and prioritisation of projects, capital structuring choices like issuing new debt or equity. Cash flow management, working capital are examples of short-term activities. These activities require techniques of working capital assessment, debtor days, debt-equity ratios, cash flow statements etc. The decisions made for the short term activities would be how much funded or non-funded limits are required and from where, supplier finance policies, treasury activities for deployment of surplus cash etc.

# 1.6 THREE PILLARS OF FINANCE FUNCTION

Considering the modern more holistic approach to financial management, the finance function rests on 3 key pillars:

1. Investment
2. Funding or financing
3. Shareholder returns such as dividends etc.

Take an example of a capital investment decision to be made by an organisation to maximise shareholder value. A corporate may evaluate multiple project options on the basis of net present value and incorporate an appropriate discount rate to factor the risk element. Subsequently financing of these projects need to be worked out and the cost of financing incorporated in the net expected returns for each project being evaluated. Projects must yield the expected returns for the shareholder else the company may reject all projects and return the cash to shareholders in the form of dividends.


**Fig 1.2 Pillars of Financial Management**

Thus, we can see that each pillar has to be considered in the context of the strategic objectives and goals of an organisation. They are inter-related and hence cannot be evaluated in isolation without impacting the other pillars. Let us understand each of these in detail.

## 1.6.1 INVESTMENT

This is by far the most important pillar on which decisions need to be made by the finance function. Investment entails deciding the asset allocation and the funding priorities of the firm. It also includes liquidity management in the form of long-term, medium-term and short-term cashflow requirements of a company. This is often a complex and tedious task as several conflicting demands are made on the funds of a firm and the finance function has to decide

how much to allocate where. Finance managers need to arrive at an objective set of parameters to evaluate various asset classes and avenues to arrive at the optimum mix which will maximise the expected returns while containing the risk within acceptable levels and ensuring smooth cash flow for running of the firm's operations and key events.

Long term assets typically require capital budgeting to be done. Capital budgeting requires the finance function to choose investment proposals by evaluating their risk-return trade-offs. Since these are long-term in nature there is an inherent risk of uncertainty in every investment proposal arising from external and internal factors and of the forecasting process itself. This has to be factored in while assessing the expected benefits stated in the proposal. Due diligence exercise is typically carried out to ascertain the risk and uncertainty and to estimate the cost of risk avoidance and mitigation. Some of the commonly uses metrics for comparing options are internal rate of return (IRR), hurdle rate, cut-off rate etc[1]. Many companies incorporate the cost of capital in arriving at the benchmarks for rates of return. Base value of cost of capital can be the return the promoters derive from deploying the capital in a low-risk instrument or the cost of borrowing of the company etc.

Historically many firms even though showing a healthy capital situation are brought down simply due to the lack of free cash flow. Cash flow or liquidity is one of the most understated and trickiest parameter of financial management. Daily working of a firm is dependent on achieving the right balance between short term assets and liabilities which translates into an optimum level of cash in the company. We say optimum level because if a firm has too much cash it is missing out on growth opportunities and wasting capital in unproductive avenues. Similarly, if the firm has less cash it impacts the smooth running of the firm and could potentially impact the image of the company if it starts defaulting on timely payments to suppliers, employees etc. Liquidity trade-off with profitability is incorporated in this part of decision-making.

*ACTIVITY: RBI on October 2019, placed restrictions on PMC Bank depositors to withdraw their money from the bank. Explore the reasons why RBI would have resorted to such an extreme measure in light of liquidity management. (Hint: you may use online resources to understand the situation at PMC Bank at that time to do this activity)*

## 1.6.2 FINANCING

While the investment decision-making activity described above determines the asset mix of the firm, the financing activity determines the funding mix viz. the sources of finance which the firm requires in its operations and investments. In larger organisations this could mean determining the optimum capital structure of the firm by choosing among multiple

[1] Students are advised to refer to the recommend book of Financial Management for further understanding these concepts

instruments of financing like equity, bank finance, market borrowings etc. The right debt – equity structuring is critical to maximising shareholder value with manageable risk. There are several theories of capital structuring e.g. capital structure theory, which will be detailed in the subsequent parts of the course. Knowledge of these theories is essential for students who want to specialise in finance and financial management.

### 1.6.3 SHAREHOLDER RETURNS

One of the important objectives of a company is to maximise shareholder wealth. Afterall it is the shareholders who have invested in the company with the expectation that the company will do well and provide a healthy return on their investment. Depending on the nature of the company whether public or privately held the form of returns could vary. Form of returns could also be dictated by majority shareholder like in case of government controlled undertakings; dividends are the more desired form of shareholder returns. In all cases big or small, dividends and profit distribution forms the crux of decision-making. This mostly vests in the form of a dividend policy, share buybacks or preferential allotments. Dividend distribution for example could impact the cashflow of a company while a preferential allotment is in a non-cash form. Alongwith cash flow, tax treatment, requirement of reserves etc. are also important parameters in determining the shareholder return policy of the firm.

## 1.7 BALANCING RISK *VS*. RETURN

One of the most important concepts in financial management is the concept of a trade-off between risk and return. Many would have heard the tagline 'high risk with high returns and vice versa'. This is true in majority of the cases and many have been fooled into believing zero-risk on certain investment categories offering high returns. Put in simple terms:

**Risk-weighted return = Risk-free return + risk premium**

Risk-free return is often the return which can be expected in a zero-risk asset. Though there is no truly zero-risk asset; sovereign risk can be taken as the closest to being zero risk (though in multi-national operations this assumption will also not hold true, but we will ignore it here). Based on a firm's appetite for risk, the risk premium will vary across companies and hence the target risk weighted return can be calculated. It is therefore a core function of the finance manager to carefully maintain this balance of risk-return. Too much risk-averseness will yield sub-optimal returns to the company while over exposure to high risk will make the firm susceptible to financial ruin.

# 1.8 BUSINESS LIFE CYCLE IMPACT ON FINANCIAL MANAGEMENT

We have seen above that financial management is not a 'one size fit all' for all types of organisations. Financial management is one of the prime responsibilities of the management of a firm as it has far-reaching consequences on the overall health, direction and survival of the organisation. It varies with multiple parameters, phase of business being one of them. Financial management strategies and tools vary with the business lifecyle phases viz. startup phase, growth phase, maturity phase and decline phase as explained below.

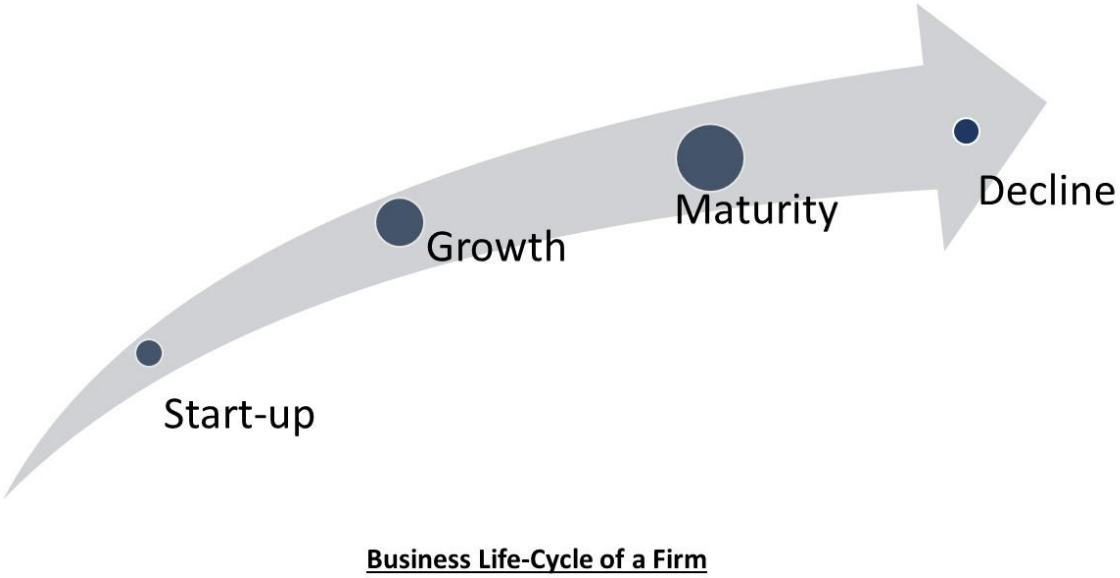



**Fig 1.3 Business Life Cycle of a Firm**

## 1.8.1 START-UP PHASE

Starting up a business is always the most stressful time in the life cycle of any business. It is characterised by limited resource availability in all forms. Many companies experience negative cash flows and losses during this period when they are seeking to establishing themselves in the market. Financial management in such a scenario is required to be hands-on, conservative and creative. The finance function itself may not be very well established in the company and may not have access to adequate tools and resources. Cash flow management and funding are the prime concerns to be addressed at this stage. Tough negotiations with buyers and suppliers, accurate cash projections, managing bank relationships and strong financial control are required at this stage till the business grows and becomes profitable.

### 1.8.2 GROWTH STAGE

Growth stage is also called a cash-guzzling stage of a business. The firm may or may not be profitable as it enters the growth stage but does require enormous quantities of cash to finance the growth. The finance manager here needs to be an ardent planner in forecasting the future financing requirements and a creative thinker in tapping sources of finance while containing finance costs. Managing demand while keeping a control on the financial ratios such as leverage, cost of capital, economic value etc. characterise financial management at this stage of the business.

### 1.8.3 MATURITY

Mature phase of business lifecycle is a steady state of normal operations. The firm is making profits, generating internal cash flows and has a stable operating cycle. Most of the expansion spurts are completed and the business is consolidating its position in the market. Key relationships with buyers, suppliers, banks have been established on mutually beneficial terms. The financial management function while ensuring a steady state of funds flow may also decide to undertake investment activity with surplus funds. The shareholder may also expect returns from their investments in the form of dividends. Optimisation of financial parameters and resource utilisation can be undertaken by management during this phase.

### 1.8.4 DECLINE

Though no business expects or plans for a decline in economic activity, it is part of the larger economy and industry life cycle. Declines in business can be temporary or permanent. Temporary declines could be a result of a recession in the economy (like financial crisis of 2008) while a permanent decline could be due to the demise of the product or service (like Kodak camera) or a result of a scandal (like Enron). Financial management for a business in decline phase needs to focus on liquidity management and ensuring financial viability of the firm at all times by adopting cost-cutting measures, putting on hold growth plans etc.

## 1.9 OBJECTIVES OF AN ORGANISATION – PROFIT VS WEALTH

We have seen above that the more common modern approach involves a holistic and analytical approach to financial management in the context of the strategic objectives of an organization. We have also discussed above that maximization of shareholder wealth is one of the common objectives of any organization. This could manifest itself in 2 forms in any company:

1. Profit maximization
2. Wealth maximization

Profit maximization as the name suggests involves increasing a firm's profits. In the traditional profit equation,

Revenue – Cost = Profit

This will translate into increasing revenue and/or decreasing cost. Profit maximisation is firmly grounded in modern economic theory which postulates that under conditions of perfect competition, profit maximization actually leads to the firm allocating its resources most efficiently and with maximum social welfare. Capital is a scarce resource and yet the driver of a firm's activities, thus it makes sense for the finance manager to focus on efficiently utilizing this resource to maximise the profit of the firm. Critics of profit maximization say that it is a single-minded pursuit of a figure at the end of the day be it profit after tax, profit before tax, gross profit etc. It often ignores fundamental tenets of financial management like time value of money, risk-return trade-off, liquidity-return trade-off etc. It also ignores the raison d'etre of the firm's existence such as producing quality output for its customer or technological excellence etc.

Profits define the firm's objective in a very narrow manner and in general does not agree with the holistic approach to financial management. This brings us to the second, more holistic concept of wealth maximization. It overcomes the limitations of profit maximization by introducing a broader concept of wealth. The Cambridge Oxford dictionary defines wealth as 'the abundance of something good'[2]. It can be associated with material possessions such as money as well as other items of value which are non-material in nature such as goodwill. Thus, wealth maximization can more closely align with both the material and non-material value objectives of a firm. More specifically this concept incorporates the following aspects:

1. Wealth maximization seeks to maximize the present value of the expected returns. Present value is an important concept to understand and comprehend for a finance manager as it is used in multiple scenarios where inflows and outflows are distributed over time and varying rates. For example, current returns are more valued as compared to the same quantity of future returns.
2. It incorporates a quality as well as a quantity dimension which serves a firm well both in the short and long term in creating shareholder value. For example, the goal of a company could be to provide cutting edge technology for its customers thus maximizing it's brand wealth.

It can be seen above that wealth maximization is a broader concept as compared to profit maximization. It incorporates the fundamentals of finance to look at parameters like net present value or internal rate of return to determine whether an activity is enhancing the

[2] https://dictionary.cambridge.org/dictionary/english/wealth

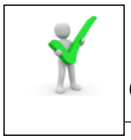
firm's value or diminishing it. It further looks at qualitative aspects of long-term shareholder value creation as part of its objective.

## 1.9.1 CONFLICTING OBJECTIVES

We have seen the twin objectives of profit and wealth maximisation earlier as being of importance to financial management. This may work well in some situations like in owner-promoter organizations or small-scale firms where the objectives of the management and owners are aligned. More often than not, in practice however things are not as simple and uni-directional as they seem. Demarcation between owners and management is seen as a sign of good governance and a professionally run organization. However, this demarcation creates potential conflict between the priorities of the owners and management. Throw into this mix other stakeholders such as government, employers, customers, suppliers and we have a mix of priorities which can be sometimes at conflict with each other and with the original objective of wealth maximization. Thus, we circle back to the strategic level of financial management which aligns with the strategic objectives of the organization

*Activity: Many Indian companies put-up their strategic goals and objectives in their annual reports or their website. List down the strategic objectives of any one Indian company and classify the objectives into financial and non-financial. For the non-financial objectives, derive a related financial objective. For example, if the company's objective is 'expansion into overseas markets', this will mean arranging funding, cross-border risk management as some of the financial objectives due to this non-financial strategic objective. (hint : you can look at https://investors.tatamotors.com/financials/73-ar-html/strategic-priorities.html as one such example)*

With the completion of the above activity students will now be able to comprehend that the goals and objectives of the firm may or may not contain financial goals at the first level. The vision/mission of the firm could centre around market leadership or customer delight or operational excellence. Does this mean that financial goals are not important for the firm or that there is no need for financial management? Obviously, the answer to that is NO. Every stated strategic goal of the organization will have a financial aspect manifest in the goal at the next level. Therefore, it is for the CFO or Finance Director to derive that from the goals and steer the finance function and financial management of the organization in accordance with the same. One of the mechanisms which can be used to do the same and also measure the performance of the firm is 'Balanced Score Card'.



## *Check Your Progress-A*

**Q1. What is Financial Management?**

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**Q2. What are the two approaches to financial management?**

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**Q3. What is involved in financial management at strategic level?**

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**Q4. Give some tools and techniques used in making investment decisions.**

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**Q5. Fill in the Blanks with appropriate word or words.**

a) The 4 stages of a business cycle are ……., ……., ……. and ……..

b) …….. is the head of the finance function in a typical organisation

c) Financial management operates at all levels of the organization namely ……., …… and ……..

d) The full form of IRR and NPV are ……. and …….

e) In the risk-return trade-off, it is normally said …… risk and ……returns go together.

f) The closest to a zero-risk instrument can be taken as ……

**Q6. State whether True or False.**

a) Accounting and financial management are one and the same.

b) Traditional approach to financial management is an outside-looking approach

c) In the decline phase of business, financial management will focus on liquidity management for survival

d) All other things being equal, 2 projects yielding the same profits but at different periods of time will have the same NPV

e) Financial management need not be concerned with cash flows in a company

## 1.10 TYPICAL ORGANISATION OF FINANCE FUNCTION

Finance function is a core element in the functioning of every organization. It's form, structure and size will vary between organisations based on various parameters such as nature of business, size and complexity of operations, industry-type, type of company etc. Given below is a typical organization structure of a fairly comprehensive finance function in an organization. Needless to say, terminologies of various roles will also vary between companies. Moreover, multi-national or multi-divisional organisations would have this function replicated across countries and divisions with an overarching group finance function.

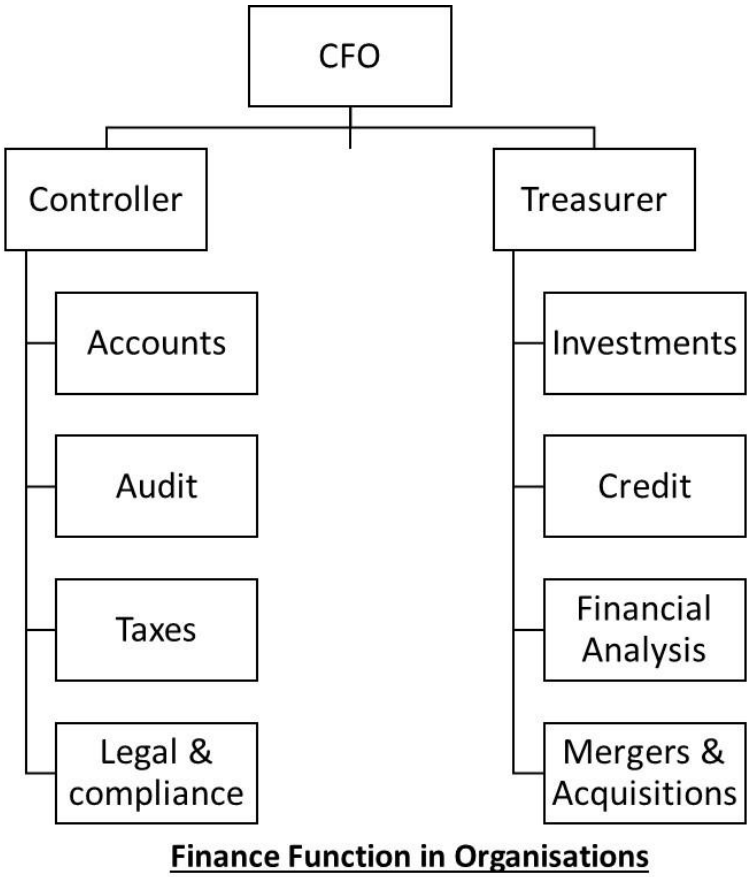



**Fig 1.4 Finance Function in Organizations**

Chief financial Officer (CFO) or Finance Director is the person who owns the finance function of the organization and reports to the Chief Executive Officer and to the Board of Directors. CFO is responsible for aligning the finance function with the strategic plan of the organization and vice versa to provide inputs to the strategic plan of the organization by highlighting the financial aspects and realities. Financial management policies laid out under the CFO direct the financial direction and health of the organization.

The CFO will have a team comprising of controllers, treasurers, credit managers, financial analysts, risk managers etc. A treasurer function will be responsible for cash management, investments, investor relations and addressing the financing requirements of the firm. While a controller function typically covers the accounting function. It will have a team of accountants, taxation managers, auditors, budgeting and planning managers etc. Financial statements, forecasts, regulatory reporting, audit and compliance comes in the ambit of the controller's function, while strategies for funding, investment strategies, mergers & acquisitions are functions of a treasurer function.

## 1.11 FINANCE AND ACCOUNTING

Finance and accounting are often used interchangeably and misunderstood as meaning the same. It is possible that in small enterprises both these functions are discharged by the same person or team. However, as finance professionals it is important to understand the inter-dependence and the differences between the 2 functions. Accounting in its purest form is the reporting of facts and figures of a company's financial aspects in the form of profit and loss accounts, expense statements, balance sheets etc. It forms an essential input to the finance function and hence has to be rendered under utmost control and compliance. Finance utilizes this data provided by accounts alongwith other sources of data to perform analytical operations on them. Assessing the firm's performance, predicting future growth, identifying areas of inefficiencies, spotting opportunities and weaknesses are all outputs of these analytical operations. Output of finance provides an input for decision-making across many levels and many functions including its own.

While accounting is very rule-driven and often governed tightly by treatment and accounting guidelines, creative accounting is a term which has garnered a bad image in the face of mega scandals such as Enron, Lehman Brothers etc. Though they are accounting failures, the finance function takes an equal blame for the same. A good and effective finance function could have spotted trouble or areas of inconsistencies much earlier than when it was discovered (by which time it was too late).

Accounting is typically seen as a reporting of past financial transactions while financial management is seen as planning for the future.

Another point of difference between accounting and financial management stems from their outlook to figures. While those in accounting function focus on the technique whether figures have been attributed to the right categories, whether the relevant principles of accounting (e.g. GAAP) have been followed etc. While financial management is focused on analysis and

assessment of the figures in the context of targets, benchmarks, goals and objectives. They may evaluate the overall health of the financial situation in the organization to spot red flags, they may perform benchmarking with a bid to optimize cash flows or reduce supplier finance.

Thus, we can see above the differences between finance and accounting and yet the inter-relationship between the two in managing the finance and compliance of an organization.

## 1.12 ROLE OF FINANCE MANAGER

We have seen above that financial management is the function which engages in planning, executing and controlling the finance-related activities of a firm. Thus, finance managers of a firm are responsible for the financial health of their organization by engaging in various investment and financing related activities. In general, a finance manager's role comprises the following functions:

- Perform analysis of financial and non-financial data
- Create financial management reporting, forecasts, performance reports etc. for senior management
- Advise the management on ways to improve the financial performance of the organization or warn them of possible trouble areas in future
- Monitor and provide governance on compliance and other legal and regulatory aspects
- Participate in development of strategies and plans for achievement of goals and objectives of the firm
- Execute investment and financing decisions
- Benchmark competitors, analyse trends, spot opportunities and threats to the financial health of the company
- Interact with analysts and other external entities in case of publicly held companies

Some of critical skills required by a finance manager are

- Analytical skills – the need to be able to analyse data, spot trends, areas of optimization, perform scenario analysis
- Communication skills – communicating analysis effectively by using visualization, written and oral forms
- Core knowledge of finance areas – knowledge of sound financial theory, ratios, benchmarks, hidden issues in financial figures

- Organisation and relationship skills – ability to manage inter-departmental relationships and external relationships to achieve role objectives. Self-organisation to handle diverse activities in a time-bound effective manner.

The role of finance manager has evolved from static reporting and monitoring to that of an astute business advisor to the senior management. Hence, a finance manager in the current times requires a blend of finance knowledge, industry understanding and technological foundation to be able to perform this role. Technology has become an important element in the area of analysis and reporting and hence an essential skill to have.

## 1.13 SUMMARY

- Financial management is a system of planning, executing, controlling and optimizing the financial resources of a firm
- Sound financial management is essential in realizing the strategic goals and objectives of a firm and enhancing its value. It helps in implementing the business strategies and growth ambitions of top management
- Financial management has 2 approaches viz. traditional approach and modern approach. Its scope varies across organizations based on their size, complexity, stage of business etc.
- Financial management has 3 elements of planning, controlling and decision-making. Decision-making itself rests on 3 pillars of investment decisions, funding or financing decisions and decisions related to shareholder returns.
- Time-value of money, risk-return trade-offs, liquidity management are foundational concepts of financial management theory
- Tools like balance scorecard are useful in a holistic approach to performance management.
- Finance function varies from organization to organization but is broadly comprising of a controlling and a treasurer function
- The role of Chief Financial Officer has evolved to a strategic level as a critical participant in the strategy formulation, planning and execution process
- Financial management and accounting are both distinct and yet inter-related concepts
- A finance manager is a complex role requiring expertise in multiple skills and knowledge areas.

## 1.14 GLOSSARY

**Financial management**– The continuous assessment, organization, management and control of the economic activity of a firm

**Dividends –** Payments usually paid out of profits of a company to its shareholders periodically

**Net present value –** The present value of future cash inflows and outflows of a project or investment arrived at by incorporating a time value of money using a discount rate

**Corporate finance –** Area of finance which primarily deals with the accounting and controlling function of financial management using appropriate tools, techniques and guidelines.

## 1.15 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

5. Answer

a) startup, growth, maturity, decline

b) Chief Financial Officer or Finance Director

c) Operational, Managerial and Strategic

d) High/High Or Low/Low

e) Internal Rate of Return, Net Present Value

f) sovereign risk

6. Answer

a) False, Financial management and accounting are distinct from each other

b) True

c) True

d) False, NPV of both projects will be different due to the discounting of the returns over varying periods of time.

e) False, Liquidity management and cash flows are an important element in financial management

## 1.16 REFERENCES

**Books**

- Prasanna Chandra, Financial Management - Theory and Practice, McGraw-Hill; 10th edition (2019)
- Eugene F. Brigham and Michael C. Ehrhardt., Financial Management: Theory & Practice Cengage Publications; 14th edition (2015)
- M.Y. Khan and P.K. Jain, Basic Financial Management, Tata McGraw-Hill Education India; (2000)
- I.M. Pandey, Financial Management; Vikas Publishing House Pvt. Ltd.; 11th edition

**e-resources**

- Webinar : The CFO Agenda: Transforming the Finance Function available at https://hbr.org/webinar/2018/12/the-cfo-agenda-transforming-the-finance-function
- Yuhao Li (October 2010). The Case Analysis of the Scandal of Enron. International Journal of Business and Management, Vol. 5, No. 10 available at www.ccsenet.org/ijbm
- Rober S Kaplan and David P. Norton (1992). The Balanced Scorecard—Measures that Drive Performance available at https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2

## 1.17 SUGGESTED READINGS

1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.

3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.
8. Additional Reading : https://www.bizmanualz.com/be-a-better-boss/what-are-the-top-ten-cfo-responsibilities.html

## 1.18 TERMINAL QUESTIONS

Q1. Differentiate between the traditional and modern approach to financial management. In your view which approach will suit a small mature company? Why?

Q2. What are the 3 pillars of financial management decision-making? Explain each pillar in detail

Q3. Is financial management same for all organisations? Discuss your answer with examples supporting it.

Q4. Profit maximisation vs wealth maximisation – which is a better metric for a firm? Support your argument with examples

Q5. Discuss the differences and inter-relationship between financial management and accounting

Q6. Draw an organisation structure of a finance function in an organisation. Discuss the various roles in the same

Q7. How has the role of the CFO evolved over years?

**Practical Question**

Q8. Looking at the role of a finance manager, create a balance scorecard for evaluating the performance of a finance manager in a typical firm. You may use online resources (https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2) to understand more about the quadrants of a balance scorecard for filling it up.

# UNIT 2 THE MATHEMATICS OF FINANCE



## 2.1 INTRODUCTION

In this unit, you will get familiar with the basics of simple and compound interest, the concept of time , value and money and various compounding and discounting techniques. Time value of money is the core of all the financial calculations involving values. To understand the meaning of Annuity and Perpetuity and to get idea about certain important terms like loan amortization.

## 2.2 OBJECTIVES

After studying this unit, you will be able to understand the following:

- Basis for time preference for money.
- Concept of simple and compound interest.
- Understand what gives money its time value.
- Get familiar with methodology of calculating present and future value.
- Learn the concept of doubling period, annuity and perpetuity.

# 2.3 CONCEPT

The task of the present unit is to explore the basic factors that affect all investment values. The Basic Valuation Model are based on the idea that money has a "time value". This is the most basic concept of financial management and is the stepping stone for further study. By this concept , it simply means that a 100 rupee note received at present (now) worth more than that a 100 rupee note received in future (or let's say two years later) and ,this summarize the principle that value of money is dependent on time and "a money received today is worth more than the money received tomorrow".

## 2.3.1 BASIS OF TIME PREFERENCE FOR MONEY

There is an individual's time preference for money . Individuals prefer to receive the money now rather than say after two or more years . Therefore , if you have a choice of Rs100 today or Rs100 a year from now , first option is always better , since Rs100 can be reinvested today lets say @ 6% interest which will fetch you Rs106 in a year's time . So , even if the future payment is same ( Rs100) , but the difference in their timing in which they are received can create a great difference in the value of the money. Time value of theory states that " A rupee tomorrow is worth less than A rupee today".

**Reasons / Justification for Time Preference of Money by Individual's :**

- Monetary Inflation: Under inflationary conditions, the purchasing power of money declines over the period of time. Greater the inflation greater will be the decline in the future value of money as compared to its value today.
- Preference of present consumption over future consumption: Individual prefer for immediate consumption over future consumption because of its importance at present or due to uncertainty to enjoy future consumption. Example: A glass of water holds greater significance today to a thirsty man , but counts little to him, if given the next day.
- Cash Flow Uncertainty : the amount which is to be received today is certain , but the amount likely to be received in future holds uncertainty or risk associated to it.
- Opportunities for Re-investment : It is preferable to take the amount today rather than a year latter (if given the choice), as reinvestment opportunity is always there and the interest can be earned in it, which will provide additional cash.

Before moving further , let's understand the basic concept of simple and compound interest :

## 2.3.2 SIMPLE INTEREST

Simple interest is the interest which is computed only on the principal amount, which is borrowed or deposited. Simple interest is a function of principal amount (borrowed or deposited),rate of interest annually and the number of year for which the principal is borrowed or lent.

***Mathematical Formula :***

***Simple Interest = P x R x N***

where 'P' = principal .

'R'= rate of interest per annum.

'N'= number of years.

(If 'X' wants to calculate his total future value at the end of nth year, then F.V is the sum total of principal amount + interest and ascertained as :

Amount at the end of nth year = principal + interest

$= P (1+ r n).$

**Illustration 1 :**

Calculate the simple interest and amount of Rs 5000 for a period of 5 years at 12% p.a.

***Solution*** : Interest = 5000 x 0.12 x 5 = 3000.

Amount = $P(1+ r n )$

$= 5000(1+ 0.12x 5) = 8000.$

**Illustration 2 :**

Mr 'X' has deposited 50,000 in the bank which pays 5 % simple interest. Mr 'X' wants to know what is going to be the future value of his money at the end of 7 years period.

***Solution*** : Future Value = $P(1 + r n )$

$= 50,000 ( 1+ 0.05 x 7)$

$= 67,500.$

**Illustration 3 :**

Calculate the rate of interest which will Rs 25,000 amount to Rs 31,000 in a period of 5 years ?

***Solution*** : Amount = $P(1+ r n )$

31000 = 25000(1+ 5r)

Rate 'r' = 4.8%.

## 2.3.3 COMPOUND INTEREST

Compound interest is the interest which is received on the principal amount and on the interest as well . The Interest for one period gets added back to the original principal to get the principal for the next year. Compound interest is also regarded as 'interest on interest' . Simple interest is the interest calculated on the original principal and no compounding of interest takes place unlike compound interest.

Compound interest can be compounded 'annually' ( the interest is given only once i.e at the end of the year), 'semi-annually'(interest paid twice per year), 'quarterly' (interest paid in 4 equal installment), 'monthly'(interest paid in 12 installments), or 'daily'(interest is paid daily i.e all 365 days).

***Symbolically ,***

**$CA = P (1+ r/n)^{n \times t}$**

where, CA = amount at the end of 't' period.

P = principal amount at the beginning of the 't' period.

r = rate of interest

t = time period in years

n = number of compounding in a year.

- If interest is compounded half yearly : $CA = P ( 1+ r/2)^{2 \times t}$
- If interest is compounded quarterly: t $CA = P ( 1+ r/4)^{4 \times t}$
- If interest is compounded monthly : $CA = P ( 1 + r/12)^{12 \times t}$
- If interest is compounded daily : $CA = P ( 1+ r/365)^{365 \times t}$

**Illustration 4 :**

Calculate the compound interest for Rs 2000 for 15 month @ 5% compounded quarterly .

***Solution :*** $CA = P ( 1+r/n)^{4n}$

Where, P = 2000 , rate 'r' = 5%, no of compounding in a year 'n' = 4( i.e quarterly), time period 't'= 15/12 (in years)

$$CA = 2000(1 + 0.05/4)^{4 X (15/12)}$$

CA = 2000x 1.064 = 2128.

CI = Amount – Principal = 2128 – 2000 = Rs 128.

***Note*** : Here the interest is given in four installments, therefore we divide 5% into four equal parts of 1.25% each .

**Illustration 5:**

Find the present value of Rs 1000 due in 6 years @ 5 % if the money is compounded semiannually.

***Solution*** : $CA = P(1 + r/2)^{2 x t}$

where , CA or Amount = 1000, r = 5%, n = 2 (compounded semi-annually), t= 6 yrs, we have to calculate the present value i.e principal 'P' .

$$1000 = P ( 1+ 0.05/2)^{2 x 6}$$

$$1000 = P x 1.34488$$

$$P = 1000/1.34488 = RS\ 743.56$$

Therefore, the present value of Rs 1000 due in 6 years is Rs 743.5.

**Illustration 6 :**

Your mother gave you Rs 1000 as a reward for your good performance in examination. You deposited it in a saving bank a/c @ 6% rate of return for 2 years. How much is the future value , you will receive after 2 years from now.

***Solution :*** Future value = Principal + interest

FV = 1000+ (0.06x1000) = 1060.

At the end of 1st year, you get Rs 60 as interest along with 1st year principal amount of Rs 1000, but we will not withdraw this amount at the end of 1st year and reinvest this amount (1060) which act as the principal for the next period. Since there occur compounding of interest ( that is, interest is earning interest) , now we reinvest our principal (1060) and calculate interest on it :

FV = Principal + Interest

= 1060 + (0.06 x 1060)

= Rs 1123.6

Therefore , Rs 1123.6 is the future value we will receive after 2 years from now.

Time value of money is the core of most of the financial decisions . Suppose, if you had been given a choice of Rs 1000 today or Rs 1130 two years from now . What will you do ?

You have two options , the second option will pay you more ( Rs 130) which is good, but after two years in future which is bad. So, overall , is the second option better or worse ? This is what we are going to understand further in this unit and how big corporate and business make these types of comparison .

## 2.4 DISCOUNTED CASH FLOW ANALYSIS

It involves calculations and financial decision making by considering at the cash flow from a business activity, where the principal behind the concept is that "the money received in future is less valuable than the money received today".

Here, we will concentrate on the mathematics behind the time value of money and the discounted cash flow problems solving techniques. Various examples which involves discounted cash flow analysis (where, we need to calculated present value 'today's value' of a cash or a series of cash flow which is to be received in future ) from our day to day experience are :

- ✓ Suppose, we deposit Rs100 in a savings bank account . How much we will have in after 10 years?
- ✓ We need to take loan of Rs100000 and will have to repay it in 5year's time. How much do I need to pay as EMI per month?
- ✓ What if , we have Rs2500000 as savings for retirement and we need to survive by it for the next 25 years , so how much amount can we withdraw each month out of it ?

All the above examples are discounted cash flow problems .

### 2.4.1 PRESENT VALUE (PV)

The method of calculating the present value (PV) of a series of Future cash flow is called 'discounting' techniques.

*Calculation of PV of a Single Amount*: The formula to calculate the P.V of a certain amount to be received after some future periods is :

$$\textbf{Present Value} = [\ \textbf{Future Value}\ (\ 1 / (1+r))^{n}\ ]$$

- The present value 'PV' of a future value 'F.V' due at the due at the end of 'n' conversion period at the rate 'r' , is given by the above formula, where 'r' is referred to as the rate of return, discount rate or the cost of capital or opportunity cost.
- The term $(1/1+r)^{n}$ is referred to as discount factor or PVF (present value factor) and is always less than 1, indicating that a future amount has a smaller P.V.

P.V can also be represented by this formula for calculations :

$$\mathbf{PV = FV_{n}\ X\ (\ PVIF_{r,n}\ )}$$

where, $FV_{n}$ = Future value receivable at the end of 'n' years, $(PVIF_{r,n})$ is the present value interest factor for 'n' periods at 'r' rate of interest . We can use a PVIF table which can provide you with the pre- calculated value of PVIF for 'n' years at 'r' rate of interest and we can multiply that value with the FV to arrive at PV.

**Illustration 7**

Let's say we need 15,00000 in 6 years. If the interest rate is 6%, how much do we need to deposit in the bank now?

***Solution :*** This kind of problem is called the PV problem, as we need to find out the today's value of a certain amount that we are going to receive in future. It is called discounting problems. The problem can be solved in a timeline as follows :

$\mathbf{PV = FV\ X\ (\ PVIF_{r,n}\ )}$

PV = 1,50,0000 x PVIF (6%,6)

= 1500000 x 0.705 = 10,57,500.

So, the present value of Rs1500000 paid 6 years from now at an interest rate of 6% is Rs10,57,500

Note : Use PVIF table and find the value for (6%,6 years)

Another formula can also be used as :

$$\textbf{Present Value} = [\ \textbf{Future Value}\ (\ 1 / (1+r))^{n}\ ]$$

PV = $1500000\ (\ 1/(1+0.06))^{6}$

= 1500000 X 0.70496 = 1,057,440 .

Therefore the present value of Rs15,000,00 paid 6 years from now at an interest rate of 6% is Rs10,57,440.

## 2.4.2 PRESENT VALUE OF A SERIES OF CASH FLOW

Most of the times we need to calculate the present value of a series of cash flow. Example , in financial analysis and in capital budgeting problems for decision making we need to convert the future value of a series of cash inflow (which can be even or uneven cash flow stream) into its present value. The cash flow can be even and uneven .

A) **Present value of uneven cash flow :**

Investment made my firms sometimes receive an uneven cash flow streams like the cash inflow from the capital investment made to a project or the dividend distribution of equity shares is uneven and growing. The present value of cash flow over a period can be calculated with following formula:

$$\mathbf{PV_n} = \frac{CIF1}{(1+r)^1} + \frac{CIF2}{(1+r)^2} + \frac{CIF3}{(1+r)^3} + \ldots + \frac{CIFn}{(1+r)^n} = \Sigma \frac{CIFt}{(1+r)^t}$$

where , *CIFn* = Cash Inflow occurring at the end of Nth year.

'r' = Discount rate

'n'= duration of the cash flow streams

't'= year in which cash flows are receivable

$PV_n$ = Present value of a cash flow stream

Present value of uneven cash flow can also be resolved using the formula :

$$\mathbf{PV = CIF1x\ PVIF_{(1,r)} + CIF2\ x\ PVIF_{(2,r)} + CIF3\ x\ PVIF_{(3,r)} + \ldots\ldots + CIF_n\ x\ PVIF_{(n,r)}}$$

**Illustration 8 :**

Calculate the present value @ 10% interest rate from the following information:

Year Cash Inflow (Rs)

| | |
|---|---|
| 0 | 2000 |
| 1 | 3000 |
| 2 | 4000 |
| 3 | 4500 |
| 4 | 5000 |
| 5 | 3500 |

***Solution :***

The Present value calculation is shown below :

$$PV_n = \frac{CIF1}{(1+r)^1} + \frac{CIF2}{(1+r)^2} + \frac{CIF3}{(1+r)^3} + \ldots + \frac{CIFn}{(1+r)^n} = \Sigma \frac{CIFt}{(1+r)^t}$$

$PV = (2000/(1+.10)^0) + (3000/(1+0.10)^1) + (4000/(1+0.10)^2) + (4500/(1+0.10)^3) + (5000/(1+0.10)^4) +$

$(3500/(1+0.10)^5)$

$= 2000 + 2727 + 3305 + 3380 + 3415 + 2173 = 17000$

**Illustration 9**

An investor has an opportunity of receiving a cash flow of 1000, 2000, 500, 1500, 800 respectively at the end of one through five years at 8% rate of interest. Find out the PV of this stream of uneven cash flow.

***Solution :*** The Present Value Calculation is shown below :

$PV = CIF1x\ PVIF_{(1,r)} + CIF2\ x\ PVIF_{(2,r)} + CIF3\ x\ PVIF_{(3,r)} + \ldots\ldots + CIF_n\ x\ PVIF_{(n,r)}$

The problem can be calculated from the above formula as well :

$PV = 1000x\ PVIF_{(1,\ 0.08)} + 2000\ x\ PVIF_{(2\ ,0.08)} + 500\ x\ PVIF_{(3,0.08)} + 1500\ x\ PVIF_{(4,0.08)} + 800\ x\ PVIF_{(5,\ 0.08)}$

$= 1000x\ 0.926 + 2000x\ 0.857 + 500x\ 0.794 + 1500x\ 0.735 + 800\ x\ 0.689$

$= 926 + 1714 + 397 + 1102.5 + 551.2 = 4690.7$

B) **Present value of a series of even cash flow:**

The Present value of series of even cash flow is also referred to as annuity, which is discussed latter in this section .

# 2.5 FUTURE VALUE

- If we put Rs100 in a bank account today, how much will we get after two years ?
- Suppose we invest Rs5000 for five years in a savings account that pays 10%interest per year. If we reinvest the interest income, then how much our investment will grow after five years?

Above problem is called the future value problem. We want to know the value in the future of an amount today. It is also called the compounding problem. Compounding is the process of finding the future value of cash inflow or outflow by using the concept of compound interest.

## 2.5.1 FUTURE VALUE OF A SINGLE CASH FLOW :

The process of investing money and also re-investing the interest earned is called compounding. The future value of an investment after 'n' years when the interest rate is 'r' percentage is :

$$FV_n = PV\,(1+r)^n$$

**OR**

$$FV_n = PV \times FVIF_{(r,n)}$$

where,

FV= future value

PV= present value

'r'= annual rate of interest

'n'= number of periods

$(1+r)^n$ = is future value interest factor(FVIF) or future value factor. The value of FVIF can be calculated by using a FVIF table or by using calculator as well .

**Illustration 10 :**

Suppose , you deposit Rs 1000 today in a bank that pays 10 percent interest compounded annually, how much will the deposit grow to after 6 years and 12 years.

***Solution :*** the above problem can be solved using the following formula :

$$FV_n = PV\,(1+r)^n$$

a) Deposit after 6 years :

FV=1000x $FVIF_{(6\ ,0\ .10)}$ , now look for the value of FVIF for 6 years and 10% from the FVIF table

FV = 1000x 1.772 = 1772 .

b) Deposit after 12 years :

FV = 1000x $FVIF_{(12\ ,\ 0.10)}$

FV = 1000x 3.138 = 3138.

## 2.5.2 FUTURE VALUE OF A SERIES OF UNEVEN CASH FLOW

Some financial instrument generates cash flow which are not constant and vary from period to period. Example : dividend on stock , cash flow generated from business activity are irregular flows .

Compound value of a series of uneven cash inflow or outflow can be calculated by the following

***formula :*** $\mathbf{FV = CF_0\ (1+r)^n + CF_1\ (1+r)^{n-1} + CF_2\ (1+r)^{n-2} + \ ...+\ CF_n\ .}$

**OR**

$$\mathbf{FV= CF_0\ X\ FVIF_{(r,n)}+CF_1\ X\ FVIF_{(r,\ n-1)}+\ .....+CF_n\ .}$$

Where, $CF_n$ = Cash flow Compounded for 0 periods .

$CF_0$ = Cash flow Compounded for the whole 'n' period.

'n' = number of periods from time 0 to the reference date given .

We first have to calculate the future value of each individual cash flow and then sum up all the cash flow to arrive at the total future value of an uneven cash flow stream.

**Illustration 11 :**

Mr. X deposit Rs1000 today into a bank account that pays a 10% interest rate per year , and follow it up with 4 more deposits to the bank at the end of each year for the next four years, which are given as below:

| Year | Cash flow |
|---|---|
| 1st | 1500 |

| | |
|---|---|
| 2nd | 2000 |
| 3rd | 500 |
| 4th | 1500 |

How much money will Mr. X accumulate in his bank account at the end of fourth year.

***Solution:*** First step : We have to calculate the future value of each individual cash flow

Second step : Sum up all the cash flow to arrive at the total future value.

Formula : $FV = CF_0 (1+r)^n + CF_1 (1+r)^{n-1} + CF_2 (1+r)^{n-2} + ...+ CF_n$ .

| Year | Cashflow |
|---|---|
| 0 | 1000 |
| 1 | 1500 |
| 2 | 2000 |
| 3 | 500 |
| 4 | 1500 |

$FV = 1000 (1+ .10)^4 + 1500(1+.10)^{4-1=3} + 2000(1+.10)^{4-2=2} +500(1+.10)^{4-3=1} +1500(1+.10)^{4-4=0}$

FV = 1000x1.4641 + 1500x 1.331 + 2000 x 1.21 + 500x1.1 +1500x1 = 7930.6 The total future value at the end of fourth year is Rs 7930.6

### 2.5.3 FUTURE VALUE OF A SERIES OF EVEN CASH FLOW

The future value of series of even cash flow is also referred to as annuity, which is discussed latter in this section .

## 2.6 DOUBLING PERIOD

Whenever we make an investment, we have questions in mind like, how long would it take to double the amount at a given rate of interest? This is doubling period. Doubling period is that time which is required to double our invested amount at a particular interest rate.

It is calculated by two rules :

*a) Rule of 72 :* According to this rule of thumb, the doubling period is obtain by dividing 72 by the interest rate.

**Formula : DP = 72 / I**

Where, DP = Doubling period , I = interest rate.

**Illustration 12**: If you have deposited Rs1000 at 10% interest rate in the bank , how many years will it take to double the amount?

Solution : DP = 72 / I

DP = 72 / 10 = 7.2 years (Approx.) , therefore , the doubling period is 7.2 years.

*b) Rule of 69:* This method is considered to be more accurate doubling period method. The formula is given by : **DP = 0.35 + 69/ Interest rate**

Lets take the same Illustration as above and using the rule of 69 :

DP = 0.35+69/10 = 7.25 .

***c) Effective Rate of interest (ERI) in case of doubling period :***

a) ERI in case of Rule of 72 : It is given by the following formula : ERI = 72 / Doubling Period

b) ERI in case of Rule 69 : It is given by the following formula : ERI = ( 69/DP) +0.35

# 2.7 ANNUITIES AND PERPETUITIES

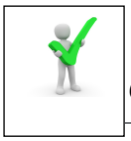
An annuity is a fixed stream of cash inflow and cash outflow occurring at a regular interval of time. Some of the examples of annuities are : a) you rent a flat and promise to make a series of payment over an agreed period , is an annuity . b) payment made to LIC premium c) depositing in a recurring deposit account .

## 2.7.1 WHAT IS AN ANNUITY?

Annuity is a series of regular cash flow for a specific duration. Example: If you have taken a loan for 30 years, you have to make 12 installment each year for 30 years , i.e, it makes for 360 payments. Now, if we need to find the present value of the payments, we have to calculate the P.V of each of the 360 payment individually, which is time consuming and rigorous as well .

There is an easy way to do it, since each of the payment is of equal amount , we take this advantage for the calculation .

***Types of annuity :*** Cash flow may occur at the end of the year or at the beginning of the year. If the cash flow occurs at the end of the year or a period it is called regular or ordinary or 'deferred annuity' whereas, if the cash flow occurs at the beginning of the year or period, it is called 'Annuity due'.



***Check Your Progress-A***

**Fill in the Blanks**

1. Time value of money explains the concept that a unit of money obtained today is _____than a unit of money obtained in future.
2. If the nominal rate of interest is 10% per annum and it is compounded annually , then the ERI will be ____ % per annum .
3. The longer the time period, the smaller the present value, when given Rs100 as future value and having a constant interest rate True/ False.
4. In _____ the first payment is delayed beyond one year .
5. In _____ there is an equal cash flow per period forever.
6. An annuity is a stream of_____ annual flow.
7. _____is repayment of loan over a period of time.
8. Earning interest on interest is called _____

## 2.7.2 FUTURE VALUE OF A DEFERRED ANNUITY

Suppose, we deposited Rs1000 in a savings bank account at the end of each of the next three years ( ie at the end of each year 1, 2 and 3) . Calculate how much amount we will have at the end of year 3, if the rate of interest is compounded at 5% annually.

This is the example of Regular or Deferred Annuity ,where the regular payment are made at the end of successive years. In the above example, we need to find the total value of the payment at a point in future.

**Formula :** $CV_n = P_1 (1+r)^{n-1} + P_2 (1+r)^{n-2} + \ldots + P_{n-1} (1+r) + P_n$

**or**

$$CV_{n\,1} = P [((1+r)^n - 1)/ r]$$

Where,

P = Fixed Periodic Cash flow

r = Interest Rate

n = duration of the amount

Note : The term in the bracket $[((1+r)^n - 1)/ r]$ is called the **compound value factor for an annuity** of Re1 , which we shall refer it as CVFA. The above equation can also be written as :

Future value = Annuity cash flow x compound value factor for annuity of Re 1 .

$$FV = A \text{ X } CVFA_{n,r}$$

**Illustration 13 :** Mr. Shyam has deposited Rs 500 at the end of every year for 6 years at 6% interest . Determine Shyam's money value at the end of 6 years.

***Solution :*** By using the formula

$$CV_n = P_1 (1+r)^{n-1} + P_2 (1+r)^{n-2} + \ldots + P_{n-1} (1+r) + P_n$$

where, r= 6% , n= 6 , P = 600

$CV_n = 600( 1.338) + 600(1.262) + 600 (1.191) + 600 (1.124) + 600 (1.060) + 600 (1.00)$

$CV_n = 802.8 + 757.2 + 714.6 + 674.4 + 636 + 600 = 4185$

Alternatively , we can use the other formula also :

Future value = Annuity cash flow x compound value factor for annuity of Re 1

Future value = 600 x CVFA(6,6%)

using the CVFA table for 6 years at 6% rate

Future value = 600 x 6.975 = 4185

## 2.7.3 FUTURE VALUE OF ANNUITY DUE

The basic difference between the regular annuity and the annuity due is that the payments that need to be made for annuity due start right from the first month itself whereas in regular annuity its starts at the end of each month.

- Suppose Mr X deposited Rs100 in a saving account at the beginning of each year for 4 years to earn 6% interest ? How much will be the future value at the end of 4 years *? Or*
- Suppose you are saving Rs500 per month for next four years at an annual interest rate of 5% compounded monthly, whereas each deposit is made at the start of each month. How much will you have at the end of three years. *Or*
- Suppose you bought a TV on instalment basis, and the dealer ask you to make the first payment immediately (at the beginning of the first month) and the remaining instalment in the beginning of the subsequent month.

Such examples involves the calculation of annuity due . The Future value of Annuity due can be calculated with the help of following formula :

Formula : $$\mathbf{CV_n = P [(1+I)^n - 1 / I] X (1+ I)}$$

Or , Future value of an annuity due = Future value of an annuity x (1+i)

$$\mathbf{FV = A \ X \ CVFA_{(n\,,\,I)} X (1+i)}$$

where, I = interest rate

p = fixed periodic cash flow

CVFA = compound value annuity factor

Note : the compound value annuity factor (CVFA) value can be calculated from the CVFA table, and should be multiplied by (1+i) to obtain the relevant factor for an annuity due.

**Illustration 14 :** Mr. Ramesh has deposited Rs 2000 at the beginning of every year for 5 years in a saving bank account at 6% compound interest. What is the value of the money at the end of 5 years .

***Solution :*** By using the above formula to calculate the annuity due :

$$CV_n = P [(1+I)^n - 1 / I] X (1+ I)$$

$$CV_5 = 2000[ (1+ 0.06)^{5-} 1 / 0.06)] X ( 1+ 0.06)$$

$$CV_5 = 2000 \times 5.637 \times 1.06 = 11950.44$$

Alternatively , it can be calculated using CVFA value from the table :

Future value of an annuity due = Future value of an annuity x (1+i)

$$= A \ x \ CVFA_{(n\,,\,I)} \ x \ (1+i)$$

$$= 2000 \times CVFA_{(5\ yrs,\ 6\%)} \ x \ (1+ 0.06)$$

$$= 2000 \times 5.637 \times 1.06 = 11950.44$$

## 2.7.4 PRESENT VALUE OF EVEN CASH FLOW (ANNUITY)

Suppose an investor gets the opportunity of receiving a fixed payment for a certain fixed number of years ( called 'Annuity'). The present value of an annuity can be found by calculating the present value of the annual amount every year and will have to aggregate all the present value to get the total present value of the annuity.

Formula : $\mathbf{PVA_n = CIF\ [\ ((1+I)^n - 1)/\ I(1+I)^n\ )]}$

where, PVA = Present Value of Annuity

I = Interest rate

n = duration of annuity

CIF = cash inflow

OR , Alternatively can be calculated by :

**Present value =** $\frac{A}{1+i} + \frac{A}{1+i^2} + \frac{A}{+i^3} + \ldots + \frac{A}{1+i^n}$

where , A = Annuity, I = interest rate

OR ,

Present value = Annuity x Present value of an annuity factor

= A x $PVFA_{n, I}$

**Illustration 15 :** Suppose I wish to determine the PV of the annuity of the cash flow of Rs50,000 per annum for 6 years. The rate of interest I can earn from my investment is 10% .

**Solution :** $PVA_n = CIF\ [\ ((1+I)^n - 1)/\ I(1+I)^n\ )]$

$PVA_n = 50{,}000[((1+0.10)^6-1)/\ 0.10(1+\ 0.10)^6\ )]$

= 50,000 x (0.7715/0.1771)

= 50,000 x 4.3562 = 217814.

## 2.7.5 PRESENT VALUE OF ANNUITY DUE

Let us consider a 2 year annuity of Rs 100 every year, at the rate of 5% per year. If the payment is made at the beginning of the year, what is the present value of this annuity ? To calculate such problem following formula can be used :

Formula : $\mathbf{PVA_n = CIF\ [\ (1- (1+I)^N)\ /I]\ (1+I)}$

OR Present value of an Annuity due = Present value of an Annuity x (1+i)

$$\mathbf{PV = A \times PVFA_{n,i} \times (1+ i)}$$

**Illustration 16:** Mr Shyam received Rs 1000 at the start of every year for 4 years. Calculate the present value of annuity due assuming 10% rate of interest .

**Solution :** By using the formula :

Present value of an Annuity due = Present value of an Annuity x (1+i)

$= A \times PVFA_{n,i} \times (1+ i) = 1000 \times PVFA_{(4, 10\%)} \times (1+0.10) = 3487.$

## 2.7.6 PERPETUITY

Perpetuity are a lot similar to annuity , but the major difference is that it occurs indefinitely , that is , the financial payment go on forever . Since the financial payments made under this worth less the farther they are in the future , and this put a limit to the value of a perpetuity. The distant payment of perpetuity becomes worth lesser and lesser until they worth almost nothing . Some examples of perpetuity are 'preference share without maturity' (irredeemable preference share) where the company is expected to make dividend payment as long as the company survives , this can be treated as infinite .

Formula : Present value of perpetuity = **Perpetuity / Interest rate .**

**Illustration 17**

Mr A , is an investor and expects a perpetual sum of Rs 400 annually from the investments made by him at an interest rate of 8%. Calculate the present value of perpetuity.

**Solution :** Present value of perpetuity = Perpetuity / Interest rate .

PV of perpetuity = 400 / 0.08 = 5000. Therefore, the present value of his perpetuity is Rs 5000.

## 2.8 LOAN AMORTIZATION

Loan is an amount raised at an interest and repayable at a specified period. Payment of loan is known as amortization . The gradual writing off of an asset or an account over a period is called 'Amortization'. The borrower of loan is usually interested to know the amount of equal installment to be paid every year to pay back the complete loan along with interest. The installment can be calculated with the following formula :

**Principal Amount = Loan Installment x $PVIFA_{N,I}$**

where, N= Loan repayment period at specified interest rate , I = Interest.

**Illustration 18 :** Suppose I have borrowed a 4 year loan of Rs10,000 at 9% . The lender of the loan requires three equal end of year repayments, calculate the annual Installment .

**Solution :** By using the formula : Principal Amount = Loan Installment x $PVIFA_{N,I}$

we can calculate the Loan Installment = $P.A/PVIFA_{N,I}$

= $10,000/PVIFA_{4, 9\%}$ = 10,000/3.240 = 3,086.

## 2.9 SINKING FUND

Sinking fund is a fund which is created out of fixed payments which are made in each period to accumulate a future sum after a specified period. Example : generally companies make sinking fund to retire debentures on maturity . The factors used to calculate the annuity for a given amount of future sum is called Sinking fund factor .

The formula for calculation of Sinking fund factor is as follows:

Sinking Fund (Annuity) = Future value x ( 1 / Compound value factor of annuity of Re 1 )

= Future value x Sinking fund factor (SFF)

= FV X 1/ $CVFA_{n,i}$

= FV ( $I/(1+i)^n$ -1)

## 2.10 SUMMARY

In this unit, we have discussed about the time preference for money, which signifies that money has a time value. A detailed understanding of what gives money its time value has been discussed later on . We also learnt about the method of calculating present and future value and discounting techniques in making financial decisions. Lastly, we get familiarity with the concept of simple interest, compound interest, doubling period, annuities and perpetuity, loan amortization and sinking fund .

## 2.11 GLOSSARY

**Discounting-**The process of ascertainment of present value is called 'Discounting'

**Nominal interest rate -** Actual rate of interest paid.

**Annuity-** It is a fixed amount of cash inflow and outflow for a specified period of time.

**Amortization-** It is a gradual writing off of assets or liability over a certain time period.

## 2.12 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

Fill in the Blanks

1. More
2. 10.38 percent
3. true
4. deferred annuity
5. Perpetuity
6. Equal
7. Amortization
8. Compound interest.

## 2.13 REFERENCES


- Kishore, Ravi. (2009). *Financial Management*, New Delhi: Taxmann Publication.
- Pandey, I.M.(2008). *Financial Management.* New Delhi: Vikas publication

- Chandra, Prasanna.(2006). *Financial Management*. New Delhi: Tata McGrawHill.
- Jordan & Corrado.(2005).*Fundamentals of Investments*(3rd edition). New York: McGraw-Hill Irwin.
- Chandra, Prasanna.(2017).*Investment Analysis and Portfolio Management.*New Delhi: Tata McGrawHill.
- Bierman and Smidt.(2007).*The Capital Budgeting Decisions.* London. p.147 and p.152

***Article :***

- Sharpe, W.F. (1964), "Capital asset prices: a theory of market equilibrium under conditions of risk", Journal of Finance, Vol.19, No. 3, pp 425-42
- Fama, E. F. and French, K. R. (2004). The capital asset pricing model: Theory and evidence. Journal of Economic Perspectives, Vol. 18 (3): 25–46.


## 2.14 SUGGESTED READINGS


1. https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-rationing/
2. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=440920
3. https://www.nseindia.com/products/content/equities/indices/beta.htm
4. Joshi, M. S. (2003). *The concepts and Practice of Mathematical Finance,* UK: Cambridge University Press.
5. Karatzas, I. and Shreve, S. (1998). *Methods of Mathematical Finance,* Verlag New York: Springer Inc.
6. Davis, M, H, A (2019). *Mathematical Finance: A Very Short Introduction,* UK: Oxford University Press


## 2.15 TERMINAL QUESTIONS

Q1. Why is the consideration of time important in financial decision making? How can time value be adjusted? Illustrate your answer .

Q2. How long will it take to double your money if it grows at 12% annually?

Q3. Calculate the Present value of Rs 600 when it is to be a) received one year from now b) received at the end of 5 years c)received at the end of 15 years , given that the time preference rate is 5%.

Q4 Define Annuity? What is the difference between an Ordinary Annuity and an Annuity due?

Q5 Fifteen Annual payments of Rs 5000 are made into deposit account that pays 14% interest per year. What is the Future Value of this annuity at the end of 15 years.

Q6 If the interest rate is 12%, what are the doubling periods as per the rule of 72 and the rule of 69 respectively.

Q7 What is the difference between simple interest and compound interest . Explain with example .

Q8 Define Perpetuity ? What is the formula for the present value of perpetuity?

# UNIT 3 RISK AND RETURN



## 3.1 INTRODUCTION

Return expresses the amount which an investor actually earned on an investment during a certain period. Return includes the interest, dividend and capital gains; while risk represents the uncertainty associated with a particular task. In financial terms, risk is the chance or probability that a certain investment may or may not deliver the actual/expected returns. Investors make investment with the objective of earning some tangible benefit. This benefit in financial terminology is termed as return and is a reward for taking a specified amount of risk.

Risk is defined as the possibility of the actual return being different from the expected return on an investment over the period of investment. Low risk leads to low returns. For instance, in case of government securities, while the rate of return is low, the risk of defaulting is also low. High risks lead to higher potential returns, but may also lead to higher losses. Long-term returns on stocks are much higher than the returns on Government securities, but the risk of losing money is also higher.

The risk and return trade off says that the potential return rises with an increase in risk. It is important for an investor to decide on a balance between the desire for the lowest possible risk and highest possible return.

Rate of return on an investment can be calculated using the following formula-

**Return = (Amount received - Amount invested) / Amount invested**

The functions of Financial Management involves acquiring funds for meeting short term and long term requirements of the firm, deployment of funds, control over the use of funds and to trade-off between risk and return.

## 3.2 LEARNING OBJECTIVES

After reading this unit, you should be able to;

- Measure the risk and return of a single asset.
- Measure the risk and return of a portfolio.
- Distinguish between systematic and unsystematic risk.
- Estimate the beta of a security.

## 3.3 RISK AND RETURN: CONCEPT AND MEANING

**Return -** Return is nothing but the reward for undertaking investment. Assessment of historical returns is must to know the performance of the fund manager. This also helps as an important input to estimate future returns.

It has two components.

Current return – It is the periodic cash flow in the form of interest or dividend

Capital return --- It represents change in the price of asset.

Thus Total Return = Current Return + Capital Return

The current return can be zero or positive, whereas capital return can be zero, positive or negative.

**Risk - What is this?**

Consider the two cases.

Mr Ramesh has put his money in RBI bond where he is going to get 12% p.a.. He is really happy with the rate of return. Will he have sleepless nights, if the economy goes into recession? Of course no.

Mr. Ramesh is very bullish with the stock market and invests money into equity diversified fund with the expectation that he will get 12% return. Will he have sleepless nights if economy goes into deep recession, and now he feels that he may get negative returns of say 5-7%? Of course yes

**What is the reason behind this?**

In the second situation, he has a fear, which is the result of huge difference in his expected return and the actual return, which he may get. This difference itself is the risk that he bears. Does he face this kind of difference in the first situation? No. So there is no risk.

Thus risk is nothing but the possibility that actual outcome of investment will differ from expected outcome of investment.

**Risk in Investment**

Risk can be broadly classified in to two types.

- Systematic Risk
- Non Systematic Risk

**1) Systematic risk -** The risk inherent to the entire market or entire market segments is known as systematic risk. This is also known as "un-diversifiable risk" or "market risk". Interest rates, inflation, economic policies, recession, wars etc all represent sources of systematic risk because they affect the entire market and cannot be avoided through diversification. This risk can be mitigated through hedging. Systematic risk is measured by Beta coefficient. Systematic risk covers:

- Market risk
- Interest rate risk
- Purchasing Power risk
- Political risk

**Market Risk -** Market risk is referred to variation in securities prices due to changes in investor's attitudes and expectations. Investors reaction on the occurring of tangible and intangible events in the main cause of affecting "market risk". The tangible events have a 'real' basis but the intangible events are based on 'psychological' basis or these are there reactions on some expectations or realities. Market risk triggers because of the real events such as political, social and economic reasons. The initial decline or rise in the share prices create an emotional instability among the investors and cause a fear of loss or create an undue confidence, relating to the possibility of profit. The fear of loss results in the excessive selling of securities and bringing down the prices of shares whereas possibility of gain results in active buying of securities. However, investors are more reactive towards decline in share prices rather than increase in prices. Market risk cannot be eliminated while financial risk can be reduced. Through diversification though market risk can be reduced but it cannot be full eliminated because prices of all securities move together and every equity stock holder will faced the risk of a downwards market.

Investors can try to eliminate the market risk by being conservative in framing their portfolios. They can time their stock purchases and can also choose growth stock as a part of

their portfolio. These methods can to some extent will reduce the risk to some degree but as mentioned earlier, market risk will not be completely eliminated. Market risk includes such factors as business recessions, depressions and long run changes in consumption in the economy.

**Interest Rate Risk –** Interest rate in the economy generally fluctuates because of the regulatory framework or due to the market forces. If the interest rate rises then it increases the investors' expected rate of return from investment, due to which prevailing share price become unattractive. Another effect of increased expected rate of return is that, low yield debentures or bonds become unattractive at the prevailing price due to which prices of these also come down. So we can say that the interest rate also accounts for a major part of the systematic risk. Recently frequent changes in CRR, Bank rate, repo rate, reverse repo rate by RBI resulted in the change in the expectation of return by investors followed by a frequent change in the share prices on the stock market.

**Purchasing Power Risk –** Purchasing power risk is also known as inflation risk. The risk arises due to the change in prices of goods and services and technically it covers both inflation and deflation periods. In India purchasing power risk is associated with inflation and rising prices in the economy. Inflation in India has been either "demand pull" or "cost push". In demand pull inflation there is increase in demand for goods but there is no smooth supply and consequently price rises. In cost push inflation the rise in prices of raw material increases the cost of production. The increase in cost of production has shown a rising trend in 'wholesale price index' and 'consumer price index'. A rising trend in price index reflects a price spiral in the economy.

**Political Risk –** Performance of stock market also depends on a political scenario. Political uncertainty adversely affects the share prices.

So from the above discussion it comes to our knowledge the market interest rates and purchasing power risk are two principal sources of systematic risk in securities. The unsystematic risk will affects the internal environment of a firm or industry. The two kinds of unsystematic risk in business organization are 'business risk' and 'financial risk'. The characteristics of these risks are broadly described.

**2) Unsystematic Risk –** The risk which is specific to a company or industry is known as unsystematic risk. This risk can be reduced through appropriate diversification. This is also known as "specific risk", "diversifiable risk" or "residual risk". Unsystematic risk covers:

- Business Risk
- Financial Risk

**Business Risk –** Business risk is associated with risks directly affecting the internal environment of the firm and those of circumstances beyond its control. The former is classified as internal business risk and the latter as external business risk. Within these two broad categories of risk, the firm operates.

Internal business risk can be because of rise and decline of total revenues as indicated in the firm's earnings before interest and taxes. A firm with high fixed cost has large internal risk because the firm find it difficult to reduce its expenses during a sluggish market. Even during the improved market conditions, a firm with high fixed cost would be unable to respond to changes in the economy because it would already be burdened with certain fixed cost factor. As far as external risk are concerned which are beyond the control of the firm are depend upon the external factors such as political policies, monetary policies, demographics factors and economic environment.

**Financial Risk -** Financial risk is associated with the capital structure of the company. Company can raises funds through equity and through the debt. A company with a high degree of debt in its financial structure has high financial leverage, which has an adverse effect on the earnings of the company. Hence companies with high financial leverage are considered as high risky and vice versa.

So the total risk of an investment consists of two components: diversifiable and non diversifiable risk. Diversifiable or unsystematic risk is that portion of an investment risk that can be eliminated by holding enough securities. Unsystematic risk is a unique to a firm or industry and is caused by factors like labour strike, irregular disorganized management policies and consumer preferences. Non diversifiable or systematic risk is external to an industry and business and is attributed to the factors, such as war, inflation and political events etc. The effect of these factors is to put pressure on all securities in such a way that the prices of the securities will move in the same direction. The relationship between total risk, diversifiable risk and nondiversifiable risk is given by the equation:

Total risk = Non systematic risk + Systematic risk

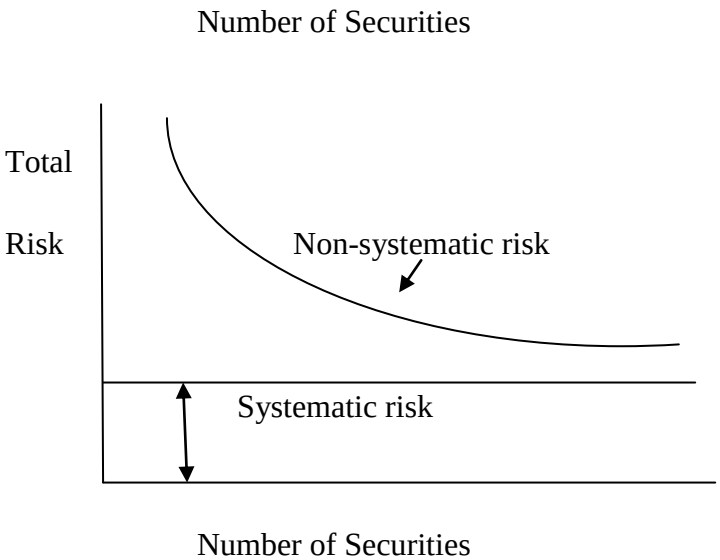
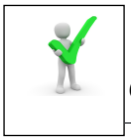



**Fig – 3.1 Graph showing effect of diversification on risk**



## *Check Your Progress-A*

**Q1. What is risk?**

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**Q2. Distinguish between systematic and unsystematic risk?**

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**Q3. What is financial risk?**

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**Q4. In what way can the relationship of risk and return be established?**

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# 3.4 QUANTIFICATION OF RETURNS AND RISK

## 3.4.1 CALCULATION OF HISTORICAL RETURNS

Single period return : Let's say Shyam invests Rs100 (P0) in Chennai Petro and one year later, he sells it for Rs110 (P1).

**A) What is the rate of return on investment?**

**B) If company pays 2 Rs. dividend (D1) during this period, what is the return on investment**?

We calculate it by using the following formula:

Rate of Return = ((P1- P0) / P0) × 100

Therefore,

((110 - 100) / 100) × 100 = 10%

A) The rate of return is 10%.

B) The rate of return = ((P1+D1- P0) / P0) × 100 = ((110+2 - 100) / 100) × 100 = 12%

There are two ways to measure multiple period returns

- Average annual arithmetic return
- Average annual geometric return

A simple example below will show what these two yardsticks measure.

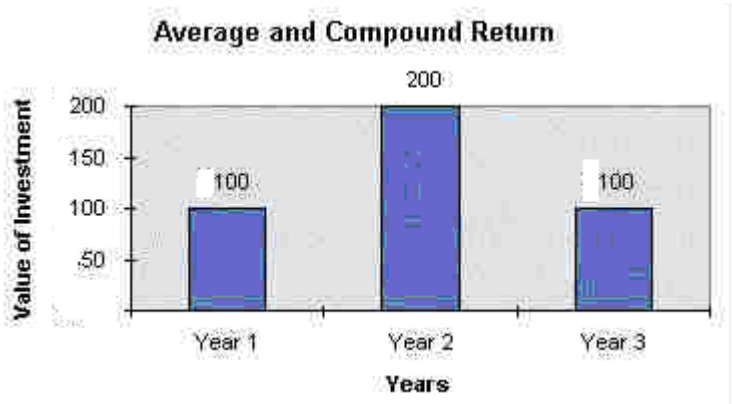



**Fig 3.2 Average and Compound Returns**

Year1 indicates investment on 31st Dec, 2015, year 2 indicates 31st Dec 16 and so on.

Just consider that you have initially invested Rs100 in the Chennai Petro. One year later, your investment grows to Rs 200 in value. The year after that, the investment drops back to Rs.100.

The Average annual arithmetic return:

((The value of investment on 31st Dec.16- Capital) / Capital) × 100% = Rate of Return

((200 - 100) / 100) × 100 = 100%

The rate of return after the second year is

((100 - 200) / 200) × 100% = -50%

So, the Average annual arithmetic return = (Rate of Return for Year 2015-16 + Rate of Return for Year 2016-17) / 2 = (100% + (-50%)) / 2 = 25%

Average annual geometric return:

Compound return (geometric mean) = The value of investment /Capital) ^ (1 / n) - 1

Where n = number of years.

So (100 / 100) ^ .5 - 1 = 0%.

Or Simply Square root of 100 /100 - 1 = 0 %

See the difference, the first method gives a return of 25% whereas second one gives the return of 0%. Just think of the investor who has been with the fund house for two years. What has he earned if he sells his investment today, it is 0%.

**Innocent investors are trapped by the fund houses through average annual arithmetic return. So investors need to watch out for Geometric return which is mentioned in the form of CAGR.**

For example. . Take the following series of returns of last four years for SBI Magnum Tax Gain Scheme: 100%, 50%, 33.33%, -75% The arithmetic mean of this series is simply (100 + 50 + 33.33 -75) / 4 = 27.08%. So far so good, right? Everybody is familiar with the arithmetic mean: it's just the sum of all values in a series divided by the number of values in the series. Problem is, taking a simple average of mutual fund returns will yield incorrect (and artificially high) results.

Say you have invested Rs10,000 in SBI tax gain scheme , which has proceeded to gain 100% It means it will become 20000Rs. Again 50% return means 30000Rs. Again 33.33% return means 40000Rs. And loss of 75% over this means again 10000Rs. It means no returns for last four years.

## 3.4.2 CALCULATION OF EXPECTED RETURN

When we talk about expectations, we talk about probability. The future or expected return of a security is uncertain, however it is possible to describe the future returns statistically as a probability distribution. The mean of this distribution is the expected return.

Take a very simple example. Suppose we know that a particular security will, over the next year, either:

rise 25%, with a 50% probability that this will happen, or

fall 20% with a 50% probability

Then:

Expected return = (25% ×50%) - (20% ×50%) = 2.5%

## 3.4.3 COMPUTATION OF HISTORICAL RISK

As it has already been mentioned, risk is nothing but possibility that actual outcome of investment will differ from expected outcome of investment. To estimate this deviation, statistical tools like Variance and standard deviations are used. Variance is the square of standard deviation. So let's see the basic behind usage of standard deviation to measure the risk and also the way to calculate it.

To understand this concept, it is necessary to know about normal distribution of data.

A normal distribution of data means that most of the examples in a set of data are close to the "average," while relatively few examples tend to one extreme or the other.

Let's say you are writing a story about nutrition. You need to look at people's typical daily calorie consumption. Like most data, the numbers for people's typical consumption probably will turn out to be normally distributed. That is, for most people, their consumption will be close to the mean, while fewer people eat a lot more or a lot less than the mean.

If you looked at normally distributed data on a graph, it would look something like this:

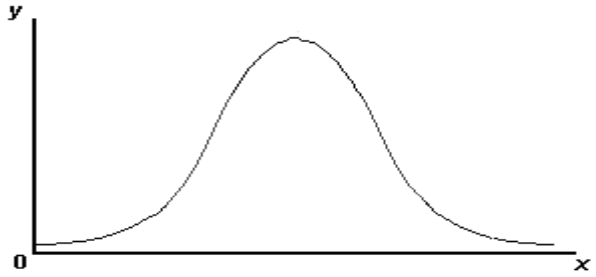



**Fig3.3 Normal Distribution**

The x-axis (the horizontal one) is the value in question... calories consumed, dollars earned or crimes committed, for example. And the y-axis (the vertical one) is the number of datapoints for each value on the x-axis... in other words, the number of people who eat x calories, the number of households that earn x dollars, or the number of cities with x crimes committed.

Now, not all sets of data will have graphs that look this perfect. Some will have relatively flat curves, others will be pretty steep. Sometimes the mean will lean a little bit to one side or the other. But all normally distributed data will have something like this same "bell curve" shape.

The standard deviation is a statistical tool that tells you how tightly all the various examples are clustered around the mean in a set of data. When the examples are pretty tightly bunched together and the bell-shaped curve is steep, the standard deviation is small. When the

examples are spread apart and the bell curve is relatively flat, that tells you have a relatively large standard deviation.

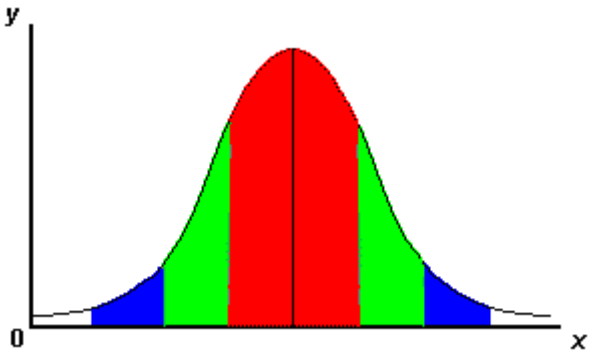



**Fig 3.4 Graphical representation of standard deviation.**

One standard deviation away from the mean in either direction on the horizontal axis (the red area on the above graph) accounts for somewhere around 68 percent of the people in this group. Two standard deviations away from the mean (the red and green areas) account for roughly 95 percent of the people. And three standard deviations (the red, green and blue areas) account for about 99 percent of the people.

If this curve were flatter and more spread out, the standard deviation would have to be larger in order to account for those 68 percent or so of the people. So that's why the standard deviation can tell you how spread out the examples in a set are from the mean.

**Why is this useful?** Here's an example: If you are comparing the returns for different periods, the standard deviation will tell you how diverse the returns are. If the rates of returns are very close to the mean the S.D. will be very less and vice versa.

**Mr.Kiran wants to invest either in Arvind Mills or SPL Industeries, Arvind Mills has mean returns of 9.5% and S.D. is 1% whereas SPL Industries has mean returns of 9.75% and S.D. is 18%. This information can help the kiran to invest into Arvind Mills even if the reurns are less by 25 basis points.**

It is a measure of the dispersion of a set of data from its mean. It simply quantifies how much a series of security's returns varies around their mean, or average returns.

To illustrate this concept, let's review the following examples.

A security that gained 1% each and every month over the past 36 months would have a standard deviation of zero, because its monthly returns didn't change from one month to the next.

A security that lost 1% each and every month would also have a standard deviation of zero, because, again, its returns didn't vary.

A security that gained 5% one month, 25% the next, and -7% the next would have a much higher standard deviation; its returns have been more varied.

Investors like using standard deviation because it provides a precise measure of how varied a security's returns have been over a particular time period in the past. Using the past standard deviation, you can predict the range of returns your security is likely to generate in the future. A large dispersion tells us how much the returns of the fund may deviate from the expected normal returns. Standard deviation is probably used more often than any other measure to gauge a fund's risk.

**Quantification of Historical Risk**

**Step by Step computation of Variance and Standard Deviation for SPL Industries**

Step 1 – Calculation of Returns

| Date | Price | Returns |
|---|---|---|
| Sep-85 | 5.9375 | |
| Sep-86 | 10.0625 | 0.694737 |
| Sep-87 | 20.8125 | 1.068323 |
| Sep-88 | 21.785 | 0.046727 |
| Sep-89 | 22.45 | 0.030526 |
| Sep-90 | 15.025 | -0.33073 |
| Sep-91 | 24.865 | 0.654908 |
| Sep-92 | 23.365 | -0.06033 |
| Sep-93 | 12.615 | -0.46009 |
| Sep-94 | 17.49 | 0.386445 |
| Sep-95 | 18.615 | 0.064322 |
| Sep-96 | 11.56 | -0.379 |
| Sep-97 | 11.0625 | -0.04304 |
| Sep-98 | 15.3125 | 0.384181 |

| | | |
|---|---|---|
| Sep-99 | 30.85938 | 1.015306 |
| Sep-00 | 59.9375 | 0.942278 |
| Sep-01 | 55.51 | -0.07387 |
| | Sumof Returns | 3.9407 |
| | Average Return | 0.246294 |

Average Return = Sum of Returns/16

Step 2 – Calculation of deviation of actual return from average return and sum of squared deviations of actual returns from expected (arithmetic mean) return,

| t | Rt | Rt - E(Rt) | $(Rt - E(Rt))^2$ |
|---|---|---|---|
| 1 | 0.694737 | 0.448443 | 0.201101 |
| 2 | 1.068323 | 0.822029 | 0.675732 |
| 3 | 0.046727 | -0.19957 | 0.039827 |
| 4 | 0.030526 | -0.21577 | 0.046556 |
| 5 | -0.33073 | -0.57703 | 0.332962 |
| 6 | 0.654908 | 0.408614 | 0.166966 |
| 7 | -0.06033 | -0.30662 | 0.094016 |
| 8 | -0.46009 | -0.70638 | 0.498978 |
| 9 | 0.386445 | 0.140151 | 0.019642 |

| | | | |
|---|---|---|---|
| 10 | 0.064322 | -0.18197 | 0.033114 |
| 11 | -0.379 | -0.62529 | 0.390987 |
| 12 | -0.04304 | -0.28933 | 0.083712 |
| 13 | 0.384181 | 0.137887 | 0.019013 |
| 14 | 1.015306 | 0.769012 | 0.59138 |
| 15 | 0.942278 | 0.695984 | 0.484394 |
| 16 | -0.07387 | -0.32016 | 0.102504 |
| Sum of $(Rt - E(Rt))^2$= | | | 3.780884 |

**Measuring Risk:**

Risk = Variance (or standard deviation) of historical returns

Variance = Sum of squared deviations of actual returns from expected

(arithmetic mean) return, divided by number of observations -1

So Variance = The sum of squared deviations shown in the last column, divided by the number of observations -1

= 3.780884/15 = .2520

Standard Deviation = Square Root of the Variance

= (0.2520)1/2 = 0.50 means 50%

2) The returns of Varun Shipping for last 6 years have been mentioned below. Calculate Variance and Standard Deviation (Standard format and formulae)

**MEASURING HISTORICAL RISK**

$$\sigma = \left[ \frac{\sum_{t=1}^{n} (R_i - \overline{R})^2}{n-1} \right]^{1/2}$$

| PERIOD | RETURN $R_i$ | DEVIATAION $(R_i - \overline{R})$ | SQUARE OF DEVIATION $(R_i - \overline{R})^2$ |
|---|---|---|---|
| 1 | 15 | 5 | 25 |
| 2 | 12 | 2 | 4 |
| 3 | 20 | 10 | 100 |
| 4 | -10 | -20 | 400 |
| 5 | 14 | 4 | 16 |
| 6 | 9 | -1 | 1 |
| | $\Sigma R_i = 60$ | | $\Sigma (R_i - \overline{R})^2 = 536$ |
| | $\overline{R} = 10$ | | |

$$\sigma^2 = \left[ \frac{\Sigma (R_i - \overline{R})^2}{n-1} \right] = 107.2 \qquad \sigma = [107.2]^{1/2} = 10.4$$

## Quantification of Ex-ante (expected ) risk

### Step by Step computation of Variance and Standard Deviation for HDIL

Probability distribution of HDIL's Expected Returns

| Market Scenario | Probability | Return on Investment |
|---|---|---|
| Very Bullish | 20% | 25% |
| Bullish | 40% | 15% |
| Bearish | 30% | 5% |
| Very Bearish | 10% | 0% |

| Market Scenario | Return on Investment | minus | Return — Expected Rate of Return | equals | answer | squared | times | Probability of the Economic Outcome | equals | Answer |
|---|---|---|---|---|---|---|---|---|---|---|
| Very | 25% | - | 12.5% | = | 12.5 | 156. | X | 20% | = | 31.25 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Bullish | | | | | | 25 | | | | |
| Bullish | 15% | - | 12.5% | = | 2.5 | 6.25 | X | 40% | = | 2.5 |
| Bearish | 5% | - | 12.5% | = | -7.5 | 56.25 | X | 30% | = | 16.875 |
| Very Bearish | 0% | - | 12.5% | = | -12.5 | 156.25 | X | 10% | = | 15.625 |
| | | | | | | | | Total | = | 66.25 |

So the total is 66.25. This is called the Variance.

The square root of 66.25 = 8.139

So the Standard Deviation is 8.139

2. Calculation of Variance and Standard Deviation (Standard format and formulae) of Bharat Foods Ltd.

## MEASURING EXPECTED (EX ANTE) RETURN AND RISK

**EXPECTED RATE OF RETURN**

$$E(R) = \sum_{i=1}^{n} p_i R_i$$

**STANDARD DEVIATION OF RETURN**

$$\sigma = [\Sigma p_i (R_i - E(R))^2]$$

***Bharat Foods Stock***

| *i.* State of the Economy | $p_i$ | $R_i$ | $p_iR_i$ | $R_i$-$E(R)$ | $(R_i-E(R))^2$ | $p_i(R_i-E(R))^2$ |
|---|---|---|---|---|---|---|
| 1. Boom | 0.30 | 16 | 4.8 | 4.5 | 20.25 | 6.075 |
| 2. Normal | 0.50 | 11 | 5.5 | -0.5 | 0.25 | 0.125 |
| 3. Recession | 0.20 | 6 | 1.2 | -5.5 | 30.25 | 6.050 |
| | $E(R) = \Sigma p_iR_i =$ | | 11.5 | | $\Sigma p_i(R_i - E(R))^2 =$ | 12.25 |

$$\sigma = [\Sigma p_i(R_i-E(R))^2]^{1/2} = (12.25)^{1/2} = 3.5\%$$

# 3.5 COMPUTATION OF PORTFOLIO RETURNS AND RISK

## 3.5.1 CALCULATING THE EXPECTED RETURN OF A PORTFOLIO

The expected return on a portfolio is the weighted average of the expected returns on the securities included in that portfolio;

What is the weight of a security in a portfolio? It is the percentage of wealth invested in that security

The formula to compute the expected return on a portfolio of N securities is

$$\bar{r}_p = \sum_{i=1}^{N} X_i \bar{r}_i ,$$

Where

$X_i$ = is the weight of security i; and

$\bar{r}_i$ = is the expected return on security i.

Example

On January 25, 1999, Mr. Ramesh bought the following stocks:

| Quantity | Price | Stock |
|---|---|---|
| 200 | 171 | RCOM |
| 500 | 185.6 | DLF |
| 1,000 | 62.5 | Hindalco |

Mr. Ramesh expects to earn the following (annual) returns on the stocks: 20% on RCOM, 12% on DLF, and 15% on Hindalco. What is the expected return on your portfolio?

First, we need to compute the weight of each security.

The total wealth invested is equal to

TI =(171*200) + (185.60*500)+(62.50*1,000)

=34,200+92,800+62,500

Hence Weights of these securities will be

X1=18.05%[=34,200/189,500]

X2=48.97%[= 92,800 /189,500];

X3=32.98%[= 62,500 /189,500].

Using the formula

$$\bar{r}_p = \sum_{i=1}^{3} X_i \bar{r}_i ,$$

**The expected return on your portfolio is 14.43%**

**[=0.1805*20%+0.4897*12%+0.3298*15%].**

## 3.5.2 CALCULATION OF RISK OF THE PORTFOLIO

Before we discuss the risk of a portfolio it is must to know the Covariance and correlation coefficient

**The Covariance between Two Rates of Return**

The covariance is a (statistical) measure of how two random variables (in this case, the returns of two securities) "move together;"

A positive covariance between the returns of two securities indicates that the returns of the two securities tend to move in the same direction, that is, better-than-expected returns for one security are likely to occur when better-than-expected returns occur for the other security;

A negative covariance between the returns of two securities indicates that the returns of the two securities tend to move in opposite directions, that is, better-than-expected returns for one security are likely to occur when worse-than-expected returns occur for the other security;

A relatively small or zero covariance between the returns of two securities indicates that there is little or no relationship between the returns of the two securities;

We denote the covariance between the return of security i and the return of security j by (the Greek letter sigma);

Note that ;You may use the Excel function "COVAR" to compute the covariance between the returns of two securities.

**The Correlation Coefficient**

The correlation coefficient is a statistical measure closely related with the covariance; The interpretation of the correlation coefficient is that of a "normalized covariance;"

We denote the correlation coefficient between the return of security i and the return of security j by (the Greek letter pho);

The relation between covariance and correlation is given by the following equation:

$$\sigma_{ij}=\rho_{ij}\sigma_i\sigma_j$$

The correlation coefficient between the return of security i and the return of security j lies between -1 and 1;

If the correlation coefficient between the returns of two securities is positive, then the returns of the two securities tend to move in the same direction, that is, better-than-expected returns for one security are likely to occur when better-than-expected returns occur for the other security;

If it is negative, then the returns of the two securities tend to move in opposite directions, that is, better-than-expected returns for one security are likely to occur when worse-than-expected returns occur for the other security;

If it is close to 0, then there is little or no relationship between the returns of the two securities;

You may use the Excel function "CORREL" to compute the correlation coefficient between the returns of two securities

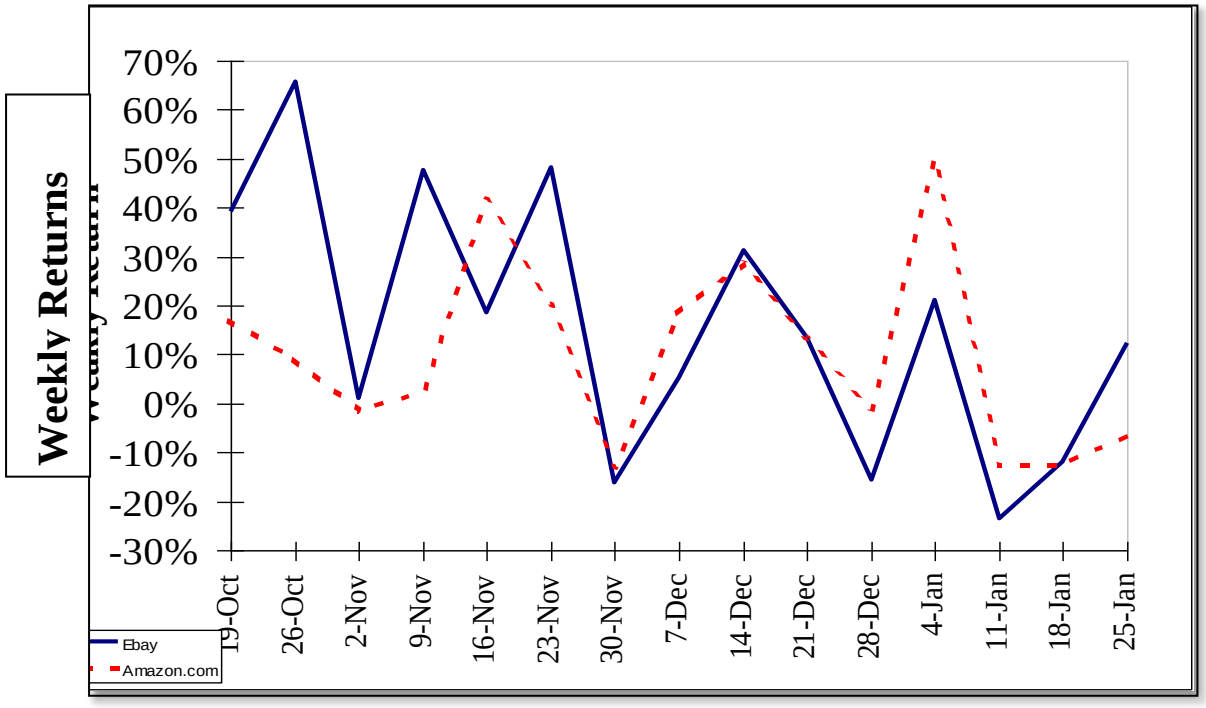



**Fig 3.5 (a) Weekly Returns**

**Weekly returns on National Fertilisers and Chambal Fertilisers in the period October 98-January 99. The Correlation Coefficient between the weekly returns of these securities turned out to be 0.48;**

The formula for CAPM is Ks = Krf + B ( Km - Krf).

Weekly returns of National Fertilisers and Chambal Fertilisers in the period October 98-January 99. The Correlation Coefficient between the weekly returns of these securities turned out to be 0.48;

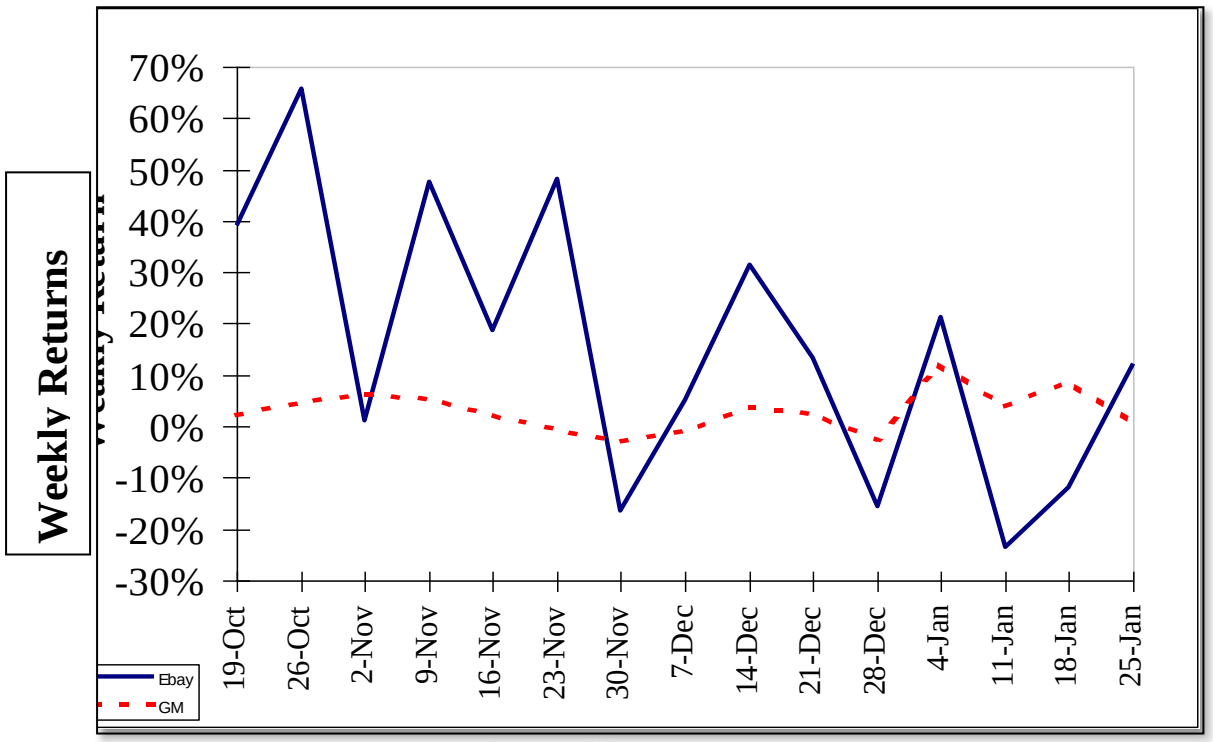



**Fig 3.5 (b) Weekly Returns**

Weekly returns of National Fertilisers and Uco Bank in the period October 98-January 99. The Correlation Coefficient between the weekly returns of these securities turned out to be .16

## Calculation of Standard Deviation of a Portfolio (Risk of Portfolio):

**The formula to compute the standard deviation of a portfolio of N securities is**

$$\sigma p = [ \sum \sum wi\ wj\ \rho ij\ \sigma i\ \sigma j\ ]\ ½$$

**Ex. – Risk of a portfolio consisting of 2 securities**

$\sigma p = [w12\ \sigma 12 + w22\ \sigma 22 + 2w1w2\ \rho 12\ \sigma 1\ \sigma 2]½$

Example : $w1 = 0.6$ , $w2 = 0.4$,

$\sigma 1 = 10\%$, $\sigma 2 = 16\%$

$\rho 12 = 0.5$

$\sigma p = [0.62 \text{ x } 102 + 0.42 \text{ x } 162 + 2 \text{ x } 0.6 \text{ x } 0.4 \text{ x } 0.5 \text{ x } 10 \text{ x } 16]½$

$= 10.7\%$

The average standard deviation of two securities is 13, which is less than standard deviation of the portfolio, which is 10. Thus diversification reduces risk.

**Ex. -- Risk of a portfolio consisting of n securities**

$\sigma p = [\ \sum \sum wi\ wj\ \rho ij\ \sigma i\ \sigma j\ ]\ ½$

$w1 = 0.5$ , $w2 = 0.3$, and $w3 = 0.2$

$\sigma 1 = 10\%$, $\sigma 2 = 15\%$, $\sigma 3 = 20\%$

$\rho 12 = 0.3$, $\rho 13 = 0.5$, $\rho 23 = 0.6$

$\sigma p = [w12\ \sigma 12 + w22\ \sigma 22 + w32\ \sigma 32 + 2\ w1\ w2\ \ \rho 12\ \sigma 1\ \sigma 2$

$+ 2w2\ w3\ \rho 13\ \sigma 1\ \sigma 3 + 2w2\ w3\ \rho 23 \sigma 2\ \sigma 3]\ ½$

$= [0.52 \text{ x } 102 + 0.32 \text{ x } 152 + 0.22 \text{ x } 202$

$+ 2 \text{ x } 0.5 \text{ x } 0.3 \text{ x } 0.3 \text{ x } 10 \text{ x } 15$

$+ 2 \text{ x } 0.5 \text{ x } 0.2 \text{ x } 05 \text{ x } 10 \text{ x } 20$

$+ 2 \text{ x } 0.3 \text{ x } 0.2 \text{ x } 0.6 \text{ x } 15 \text{ x } 20]\ ½$

$= 10.79\%$

# 3.6 MEASUREMENT OF SYSTEMATIC RISK - BETA

## CALCULATION OF BETA

Beta– Beta is a measure of any individual stock's risk (or movement) relative to the overall stock market risk (or movement). It's sometimes referred to as financial elasticity. It's just one of several values that stock analysts use to get a better feel for a stock's risk profile. Beta values are fairly easy to interpret. If the stock's price experiences movements that are greater or more volatile than the stock market, then the beta value will be greater than 1. If a stock's price movements, or swings, are less than those of the market then the beta value will be less than 1. Since increased volatility of stock price means more risk to the investor, we'd also expect greater returns from stocks with betas over 1. The reverse is true of a stock's beta is less than 1 - we'd expect less volatility, lower risk, and therefore lower overall returns. Although beta allows you to understand if the price of that security has been more or less volatile than the market itself - and that's certainly a good thing to understand about a stock one is planning to buy.

**Calculation of Beta value of a Security**

| Period | Return on stock $A$, $R_A$ | Return on market portfolio, $R_M$ | Deviation of return on stock $A$ from its mean $(R_A - \overline{R_A})$ | Deviation of return on market portfolio from its mean $(R_M - \overline{R_M})$ | Product of the deviation, $(R_A - \overline{R_A})^*$ $(R_M - \overline{R_M})$ | Square of the deviation of return on market portfolio from its mean $(R_M - \overline{R_M})^2$ |
|---|---|---|---|---|---|---|
| 1 | 10 | 12 | 0 | 3 | 0 | 9 |
| 2 | 15 | 14 | 5 | 5 | 25 | 25 |
| 3 | 18 | 13 | 8 | 4 | 32 | 16 |
| 4 | 14 | 10 | 4 | 1 | 4 | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | **16** | **9** | **6** | **0** | **0** | **0** |
| **6** | **16** | **13** | **6** | **4** | **24** | **16** |
| **7** | **18** | **14** | **8** | **5** | **40** | **25** |
| **8** | **4** | **7** | **-6** | **-2** | **12** | **4** |
| **9** | **- 9** | **1** | **-19** | **-8** | **152** | **64** |
| **10** | **14** | **12** | **4** | **3** | **12** | **9** |
| **11** | **15** | **-11** | **5** | **-20** | **-100** | **400** |
| **12** | **14** | **16** | **4** | **7** | **28** | **49** |
| **13** | **6** | **8** | **-4** | **-1** | **4** | **1** |
| **14** | **7** | **7** | **-3** | **-2** | **6** | **4** |
| **15** | **- 8** | **10** | **-18** | **1** | **-18** | **1** |

**$\sum R_A = 150$ $\sum R_M = 135$ $\sum (R_A - \overline{R_A}) * (R_M - \overline{R_M}) = 221$ $(R_M - \overline{R_M})^2 = 624$**

**$\overline{R_A} = 10$ $\overline{R_M} = 9$**

**So Beta = 221/624 =.3541**

Zero beta: This is another rarity, where the price of stock stays same over time irrespective of market movement. This can sometimes happen in sideways moving markets, where no major economic /industry/ company news is coming up.

Beta less than one: This happens when the stock price moves less in comparison of market. Many blue-chip and large-cap company stocks have beta value less than one, which make them qualify for low-risk investments. But these stocks tend to offer low-returns; and are not so suitable for short-term trading.

Beta of one: This happens when the stock price movement is same as that of market. This is true for many index-linked stocks and funds.

Beta greater than one: Beta exceeds one when the stock price movement surpass market movement. Many fast growing, mid and small-cap company stocks have beta higher than one. These stocks tend to offer better return for high-risk taken, but many of them are less suitable for long-term investing. Remember, very high beta levels may indicate low liquidity causing increase in volatility.

Negative beta: This is an interesting but rare condition where the price of the stock moves in reverse direction to the market movement. Usually no stock has prolonged negative beta value as most (all) them move with the market.

Staple stocks are thought to be less affected by cycles. Such stocks are not severally affected by major economic trends say inflation or recession and usually have lower beta.Globally, companies in the consumer goods sector, especially FMCG, pharma and Healthcare products, are considered to be non-cyclical and are thus, low-beta in nature. For ex. Nestle, HUL, Godrej Consumer Products, ITC, Aventis, GSK Pharma etc.

## 3.7 SECURITY MARKET LINE

The Security Market Line represents the average or normal, trade-off between risk and return for a group of securities – where risk is measured typically, in terms of Beta value of the securities.

$$E(R_i) = R_f + [E(R_M) - R_f]\,\beta_i$$

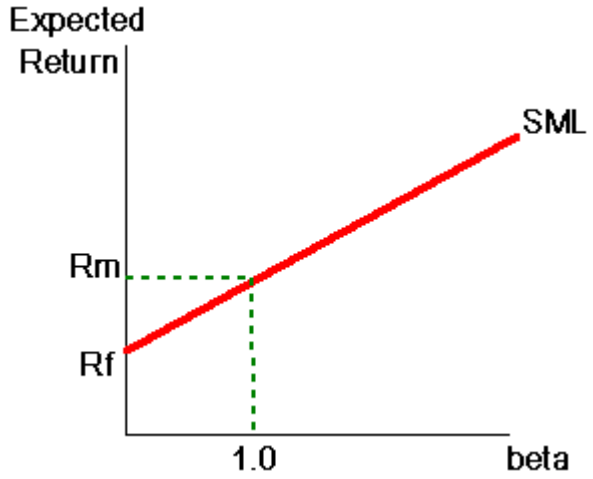



**Fig 3.6 (a) Security Market Line**

The red line is the Security Market Line in the above diagram. Assets which are fairly priced plot exactly on SML. Underpriced securities plot above SML, whereas overpriced plot below the SML. The difference between the actual expected return and fair return as per SMLis called the security's alpha.

How to develop a security market line:

Let's assume that the risk free rate is 5%, and the overall stock market will produce a rate of return of 12.5% next year. Now put few sample betas into equation and you get the SML

I f you make a graph of this situation, it would look like this:

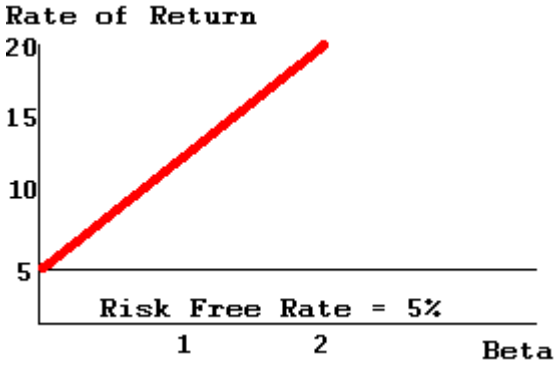



**Fig 3.6 (b) Security Market Line**

On the horizontal axis are the betas of all companies in the market

On the vertical axis are the required rates of return, as a percentage

The red line is the Security Market Line.

Consider GSK Ltd which has a beta say 1.33333 So the fair return as per SML is

5%+1.33(12.5-5)= 15%. But if investors do expect 20% return from this stock then

Alpha = 20-15=5%

## 3.8 SUMMARY

Return is nothing but the reward for undertaking investment. Assessment of historical returns is must to know the performance of the fund manager. This also helps as an important input to estimate future returns.Risk is defined as the possibility of the actual return being different from the expected return on an investment over the period of investment. Low risk leads to low returns. For instance, in case of government securities, while the rate of return is low, the risk of defaulting is also low. High risks lead to higher potential returns, but may also lead to higher losses. Long-term returns on stocks are much higher than the returns on Government securities, but the risk of losing money is also higher.

The risk and return trade off says that the potential return rises with an increase in risk. It is important for an investor to decide on a balance between the desire for the lowest possible risk and highest possible return.

This unit examined ways to quantify historical return and risk to help analyze alternative investment opportunities. We considered two measures of mean return (arithmetic and geometric) and applied these to a historical series for an individual investment and to a portfolio of investments during a period of time. We considered the concept of uncertainty and alternative measures of risk (the variance, standard deviation, and a relative measure of risk—the coefficient of variation).

## 3.9 GLOSSARY

**Risk Free Rate:** It is a compensation for time and risk premium for risk.

**Risk – Return Trade Off:** Levelling of risk and return is known as risk – return trade off.

**Beta:** The β is a sensitivity measurement, indicating the relationship between prices of a share and market in general. It is the way to represent the association of the share price with the index of the market. It is used to indicate the level of systematic risk of a share.

## 3.10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

5. Answer

a) startup, growth, maturity, decline

b) Chief Financial Officer or Finance Director

c) Operational, Managerial and Strategic

d) High/High Or Low/Low

e) Internal Rate of Return, Net Present Value

f) sovereign risk

6. Answer

a) False, Financial management and accounting are distinct from each other

b) True

c) True

d) False, NPV of both projects will be different due to the discounting of the returns over varying periods of time.

e) False, Liquidity management and cash flows are an important element in financial management

## 3.11 REFERENCES


- S Kevin (2015). Security Analysis and Portfolio Management. PHI Learning private.
- Edwin J.Elton Martin J.Gruber (2010) . Modern Portfolio Theory and Investment Analysis. Wiley publications
- Preeti Singh (2003). Investment Management, Security Analysis and Portfolio Management.Himalaya Publishing House.
- Fischer and Jordon (2009). Security Analysis and Portfolio Management. Pearson Education.
- VA Avdhani (1997)Security Analysis and Portfolio Management, Himalaya Publishing , Mumbai.
- Dhanesh Kumar Khatri (2011) Security analysis and portfolio management. Macmillan Publishers India Ltd.
- V.K Bhalla (2011).Investment Management, Security Analysis and Portfolio Management: S.Chand & Company Ltd.


## 3.12 SUGGESTED READINGS


1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.

5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.

## 3.13 TERMINAL QUESTIONS

Q1. What is the meaning of risk?

Q2. How is the rate of return on an asset defined?

Q3. Explain risk-return trade off.

Q4. What is Beta? How is it interpreted?

# UNIT 4 INDIAN FINANCIAL SYSTEM



## 4.1 INTRODUCTION

The economic development of any country depends upon the existence of a well organized financial system. It is the financial system which supplies the necessary financial inputs for the production of goods and services which in turn promotes the well being and standard of living of the people of a country. Thus, the 'financial system' is a broader term which brings under its fold the (i) financial markets made up of capital/ securities market, money market and foreign exchange market, (ii) the financial institutions/intermediaries like banks, mutual funds, insurance companies and so on which support the system by collecting funds from the savers/investors and distribute them to the entrepreneurs for the productive ventures, and (iii) financial assets such as shares, debentures, derivative and so on. An efficient financial system facilitates the free flow of funds to more productive activities and thus promotes investment. Thus, the financial system provides the intermediation between savers and investors which in turn stimulate the capital formation and ultimately promotes faster economic growth.

## 4.2 LEARNING OBJECTIVES

After reading this unit, you should be able to

- Discuss the functions of Indian financial system.
- Know the structure of Indian financial system.
- Classify financial among various dimensions.
- Understand how Capital Market plays an important role in resource allocation.
- Discuss the growth and weakness of Indian financial system.

## 4.3 FINANCIAL SYSTEM: MEANING AND DEFINITIONS

A financial system functions as an intermediary between savers and investors. It facilitates the flow of funds from the areas of surplus to the areas of deficit. It is concerned about the money, credit and finance. These three parts are very closely interrelated with each other and depend on each other. A financial system may be defined as a set of institutions, instruments and markets which promotes savings and channels them to their most efficient use. It consists of individuals (savers), intermediaries, markets and users of savings (investors). In the worlds of Van Horne, "financial system allocates savings efficiently in an economy to ultimate users either for investment in real assets or for consumption".

According to Prasanna Chandra, "financial system consists of a variety of institutions, markets and instruments related in a systematic manner and provide the principal means by which savings are transformed into investments". Thus financial system is a set of complex and closely interlinked financial institutions, financial markets, financial instruments and services which facilitate the transfer of funds. Financial institutions mobilise funds from suppliers and provide these funds to those who demand them. Similarly, the financial markets are also required for movement of funds from savers to intermediaries and from intermediaries to investors. In short, financial system is a mechanism by which savings are transformed into investments.

## 4.4 FUNCTIONS OF FINANCIAL SYSTEM

The main functions of a financial system which contributed for the economic growth may be briefly discussed as below:

**1. Saving function:** Most important function of a financial system is to link savers and investors and, thereby, help in mobilising funds and channelize them to productive activities efficiently and effectively. It is through financial system that savings are transformed into investments.

**2. Liquidity function**: The important function of a financial system is to provide money and monetary assets for the production of goods and services. Monetary assets are those which can be converted into cash easily without loss of value. All activities in a financial system are related to liquidity-either provision of liquidity or trading in liquidity.

**3. Payment function:** The financial system offers a very convenient mode of payment for goods and services. The cheque system and credit/debit card system are the easiest methods of payment in the economy. The cost and time of transactions are considerably reduced.

**4. Risk function:** The financial markets provide protection against life, health and income risks. These guarantees are accomplished through the sale of life, health insurance and property insurance policies.

**5. Information function:** A financial system makes available price-related information. This is a valuable help to those who need to take economic and financial decisions. Financial markets disseminate information for enabling participants to develop an informed opinion about investment, disinvestment, reinvestment or holding a particular asset.

**6. Transfer function:** A financial system provides a mechanism for the transfer of the resources across geographic boundaries.

**7. Reformatory functions:** A financial system undertaking the functions of developing, introducing innovative financial assets/instruments services and practices and restructuring the existing assts, services etc, to cater the emerging needs of borrowers and investors (financial engineering and re engineering).

**8. Other functions**: It assists in the selection of projects to be financed and also reviews performance of such projects periodically. It also promotes the process of capital formation by bringing together the supply of savings and the demand for investible funds.

## 4.5 STRUCTURE OF INDIAN FINANCIAL SYSTEM

The financial structure/ organisation of financial system consist of (1). Financial instruments (2). Financial Institutions (3). Financial markets (4). Financial Services

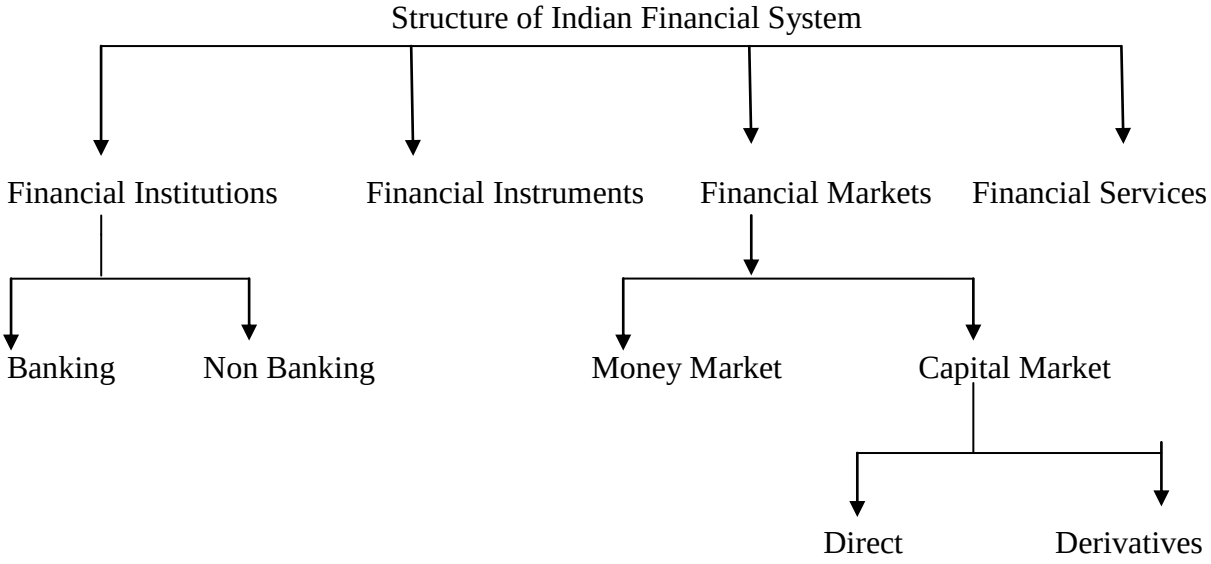



**Fig 4.1 Structure of Indian Financial System**

Source: D.K Murthy, Venugopal

Let us discuss each component of Financial System to understand its importance in the Indian economy.

## 4.6 FINANCIAL INSTRUMENTS/ ASSETS (SECURITIES)

Financial instruments are the financial assets, securities and claims. Financial assets represent claims for the payment of a sum of money sometime in the future and/or a periodic payment in the form of interest or dividend. Financial liabilities are the counterparts of financial assets. They represent promise to pay some portion of prospective income and wealth to others.

Financial assets and liabilities arise from the basic process of financing. Some of the financial instruments are tradable/ transferable. Others are non tradable/non-transferable. Financial assets like bank deposits, insurance policies, NSCs, provident funds and pension funds are not tradable. Securities (included in financial assets) like equity shares, preference shares, debentures, bonds and government securities are tradable and hence they are transferable. In short, financial instruments are instruments through which a company raises finance.

The financial instruments may be capital market instruments, money market instruments or hybrid instruments. The financial instruments that are used for raising funds through the capital market are known as capital market instruments. These include equity shares, preference shares, warrants, debentures /bonds including innovative debt instruments. These securities have a maturity period of more than one year.

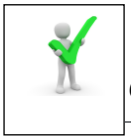
The financial instruments that are used for raising and supplying money in a short duration normally up to one year through money market are called money market instruments. Money market is basically the source of working capital to the industry. Examples of money market instruments are treasury bills, commercial paper, call money, short notice money, certificates of deposits, commercial bills, money market mutual funds.

Hybrid instruments are those instruments which have the features of both equity and debenture. Examples are convertible debentures, warrants etc. Financial instruments may also be classified as cash instruments and derivative instruments. Cash instruments are financial instruments whose value is determined directly by markets. Derivative instruments are financial instruments which derive their value from some other financial instrument or variable.

Financial instruments can also be classified into primary instruments and secondary instruments. Primary instruments are instruments that are directly issued by the ultimate investors to the ultimate savers. For example, shares and debentures directly issued to the public. Secondary instruments are issued by the financial intermediaries to the ultimate savers. For example, UTI and mutual funds issue securities in the form of units to the public.

**Characteristics of Financial Instruments:** The important characteristics of financial instruments may be outlined as below:

1. Liquidity: Financial instruments are highly liquid. These can be easily and quickly converted into cash.
2. Marketing: Financial instruments facilitate easy trading in the market. They have a ready market.
3. Collateral value: Financial instruments can be pledged for getting loans.
4. Transferability: The ownership of financial instruments can be easily transferred from one person to another.
5. Maturity period: The maturity duration of financial instruments may be short term; medium term or long term depends upon the nature of instruments.
6. Transaction cost: Financial instruments involve buying and selling cost. The buying and selling costs are called transaction costs.
7. Risk: Financial instruments carry risk of loss. This is because there is uncertainty with regard to payment of principal or interest or dividend as the case may be.
8. Future trading: Financial instruments facilitate future trading so as to cover risks due to price fluctuations, interest rate fluctuations etc.



***Check Your Progress-A***

**Q1. Discuss the role of financial system in the economic development of a country.**

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**Q2. What are the functions of financial system?**

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**Q3. Explain the structure of Indian Financial System.**

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**Q4. Discuss capital market instruments.**

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**Q5. What are the hybrid instruments?**

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**Q6. Discuss the characteristics of financial instruments.**

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# 4.7 FINANCIAL INSTITUTIONS

Financial institutions are the participants in a financial market. They are business organizations dealing in financial resources of the economy. They collect funds from individuals and institutions by accepting deposits and lend further to industries, entrepreneurs and others for the economic growth. They also deal in the buying and selling of financial instruments. They generate financial instruments as well. Financial institutions are the business organizations that act as mobilisers of savings and providers of finance. They also provide various financial services to the community. They deal in financial assets such as deposits, loans, securities and so on.

On the basis of the nature of activities, financial institutions may be classified as: (a) Regulatory and promotional institutions, (b) Banking institutions, and (c) Non-banking institutions.

1**. Regulatory and Promotional Institutions**: Financial institutions, financial markets, financial instruments and financial services are all regulated by regulators like Ministry of Finance, the Company Law Board, RBI, SEBI, IRDA, Dept. of Economic Affairs, Department of Company Affairs etc. The two major Regulatory and Promotional Institutions in India are Reserve Bank of India (RBI) and Securities Exchange Board of India (SEBI). Both RBI and SEBI administer, legislate, supervise, monitor, control and discipline the entire financial system. RBI is the supreme financial institution in India. All financial institutions are under the control of RBI. The financial markets are under the control of SEBI. Both RBI and SEBI have laid down several policies, procedures and guidelines. These policies, procedures and guidelines are changed from time to time so as to set the financial system in the right direction.

2**. Banking Institutions**: Banking institutions mobilise the savings of the people. They provide a mechanism for the smooth exchange of goods and services. They extend credit while lending money. They not only supply credit but also create credit. There are three basic categories of banking institutions. They are commercial banks, co-operative banks and developmental banks.

3. **Non-banking Institutions:** The non-banking financial institutions also mobilize financial resources directly or indirectly from the people. They lend the financial resources mobilized.

They lend funds but do not create credit. Companies like LIC, GIC, UTI, Development Financial Institutions, Organisation of Pension and Provident Funds etc. fall in this category. Non-banking financial institutions can be categorized as investment companies, housing companies, leasing companies, hire purchase companies, specialized financial institutions (EXIM Bank etc.) investment institutions, state level institutions etc.

Financial institutions are financial intermediaries. They intermediate between savers and investors. They lend money and also mobilise savings. They may be further classified into two types:

**(i) Capital Market Intermediaries:** These intermediaries mainly provide long term funds to individuals and corporate customers. They consist of term lending institutions like financial corporations and investment institutions like Life Insurance Corporation of India (LIC).

**(ii) Money Market Intermediaries:** Money market intermediaries supply only short term funds to individuals and corporate customers. They consist of commercial banks, cooperative bank.

## 4.8 FINANCIAL MARKETS

Financial markets are another part or component of financial system. Efficient financial markets are essential for speedy economic development. Financial markets are not in itself sources of finance but they are a link between the savers and investors. In a broader term, financial market may be described as any marketplace where buyers and sellers participate in the trade of assets such as equities, bonds, currencies and derivatives. The main organized financial markets in India are the money market and the capital market. The first is the market for short term securities while the second is a market for long-term securities, i.e. securities having a maturity period of one year and more. Financial markets can also be classified as primary and secondary markets. While the primary market deals with new issues, the secondary market is meant for trading in outstanding or existing securities.

The participants in the financial markets are corporations, financial institutions, individuals and the government. These participants trade in financial products in these markets. They trade either directly or through brokers and dealers. In short, financial markets are markets that deal in financial assets and credit instruments.

**Functions of Financial Markets:** The main functions of financial markets are outlined as below:

1. **Borrowing & Lending**: Financial market transfers fund from one economic agent (saver/lender) to another (borrower) for the purpose of either consumption or investment.

2. **Price Determination**: Prices of the new assets as well as the existing stocks of financial assets are set in financial markets. Determination of prices is a major function of financial market.
3. **Assimilation and Co-ordination of Information:** It gathers and co-ordinates information regarding the value of financial assets and flow of funds in the economy.
4. **Liquidity:** Investors can readily sell their financial assets through the mechanism of financial markets. In the absence of financial markets which provide such liquidity, the motivation of investors to hold financial assets will be considerably diminished.
5. **Risk Sharing**: It distributes the risk associated in any transaction among several participants in an enterprise.
6. **Efficiency:** It reduces the cost of transaction and acquiring information. It helps to increase efficiency in financial market.

**Classification of Financial Market:**

The financial market can be classified as follows:

(a) **Unorganized Markets:** Unorganized markets consists of money lenders, indigenous bankers, traders, etc. who lend money to the general public. Indigenous bankers also collect deposits from the public. There are also private finance companies, chit funds, Nidhis etc whose activities are not controlled by the RBI. The RBI has already taken some steps to bring unorganized sector under the organized fold.

(b) **Organized Markets:** Organized markets have standardized rules and regulations governing their financial dealings. There is also a high degree of institutionalization and instrumentalization. These markets are under the strict supervision and control by the RBI or other regulatory bodies. These organized markets can be further classified into two;

(i) Capital Market and

(ii) Money Market.

## 4.9 CAPITAL MARKET: MEANING AND CONCEPT

Capital Market is one of the significant aspects of financial market. Hence it is necessary to study its correct meaning. Broadly speaking the capital market is a market for long term funds having long term or indefinite maturity period. It is an institutional arrangement to borrow and lend money for a longer period of time. It consists of participants like mutual funds, insurance organization, foreign institutional investors, business units, corporate and individuals. Capital market can be classified into primary/ new issue market and secondary markets/stock exchanges. Primary market deals with the new securities, that is, securities which are not previously available and offered to the investors first time. These securities are

first time offered to the investors or funds are mobilized through the public issues of prospectus, private placement, right issues and preferential issues. Whereas secondary market is a market in which, existing securities are resold and bought among investors or traders usually on a stock exchange, over the counter or elsewhere. From the peripheral /marginal role in the early eighties, capital market now occupies the centre stage in the Indian financial system.

**Capital market instruments**

The main capital market instruments in India are given below;

**Equity Shares:** Equity shares are the source of long term capital of the company and it represent the real ownership of a company. The holders of the equity shares have voting rights and they participate in the important decision of the company. Features of equity shares are given below:

- Voting right for the shareholders.
- No maturity period
- Residual claim on income as well as on assets
- No fixed dividends
- Chances of getting bonus shares
- Pre-emptive rights

**Preference Shares:** Preference shares are shares on which the dividend is paid by the company, subject to the availability of the sufficient profits. Preference share holders are given preference over and above equity shareholders. Such preference is given at the time of income distribution and at the time of liquidation of company when assets are distributed. These have the following features;

- Fixed dividend percentage on the face value
- Preference over equity shareholders
- A fixed maturity period or provision of conversion in to the equity shares
- No voting rights
- No privilege for right and bonus shares

Generally these shares do not command the high market value because of the fixed dividend and no privilege for right and bonus shares.

**Debentures:** Debentures are the loan taken by the company from the general public-they carry a coupon rate called rate of interest. Interest on these is generally paid half yearly and payments of these are the legal obligation of the company. Company has to pay interest whether it earned profit or not. Debentures have the following features:

- Like preference shareholders debenture holders also don't have the voting rights.
- Payment of interest is at the fixed rate.
- Debentures can be secured or unsecured

- Debenture holders have priority over the preference shares holders and equity shareholders.
- Interest is tax deductible expense for the company.

**Forward contracts:** A forward contract is a customized contract/ agreement between two parties, where settlement takes place on a specific date in future at a price agreed today. Forward contracts are bilateral contracts and hence exposed to counter party risk. Each contract is custom designed and hence is unique in terms of contract size, expiration date and the asset type and quality. Forward contracts are normally traded outside the stock exchange. The contract has to be settled by delivery of the asset on expiration date. A major drawback of the forward contract is the risk of default. To minimize the risk of default, another financial instrument is introduced, the futures.

**Futures:** Like a forward contract, a futures contract is an agreement between two parties to buy and sell an asset at a certain time in future at a certain price. Unlike forward contracts, future contracts are normally traded on an exchange. This means that the contract is traded just like a normal stock, where the supply and demand of similar futures determine the trading price of the contract.

To make trading possible, the exchange specifies certain standardized features of the contract. As the two parties of the contract do not necessarily know each other, the exchange also provides the mechanism that gives the two parties a guarantee that the contract will be honoured.

**Options**: Options are contract where the holder of the instrument has the right to buy or sell the underlying asset at a predetermined price. A person who has an Option Contract need to execute the trade only if he wants to execute it. In other words he has the Option. An option can be a **call option** or **put option**. A call option gives the buyer a right to purchase an assets at a specified price on or before some specified expiration date. The specified price is called the Strike Price.

## 4.10 MONEY MARKET

Money market is a very important segment of a financial system. It is the market for dealing in monetary assets of short-term nature. Short-term funds up to one year and financial assets that are close substitutes for money are dealt in the money market. Money market instruments have the characteristics of liquidity (quick conversion into money), minimum transaction cost and no loss in value. Excess funds are deployed in the money market, which in turn is availed of to meet temporary shortages of cash and other obligations. Money market provides access to providers and users of short-term funds to fulfil their investments and borrowings requirements respectively at an efficient market clearing price. The money market is one of the primary mechanism through which the Central Bank influences liquidity and the general

level of interest rates in an economy. The Bank's interventions to influence liquidity serve as a signalling-device for other segments of the financial system.

The money market functions as a wholesale debt market for low-risk, highly liquid, short term instruments. Funds are available in this market for periods ranging from a single day up to a year. Mostly government, banks and financial institutions dominate this market. It is a formal financial market that deals with short-term fund management.

**Features of Money Market:**

The money market has certain distinct operational features as compared to the capital market. First, while in the money market the operations (raising and deployment of funds) are for short duration (normally up to one year), in the capital market they are for long duration. Further money market is the institutional source of working capital to the industry, the focus of the capital market being on financing fixed investments. There are large numbers of participants in the money market: commercial banks, mutual funds, investment institutions, financial institutions and finally the Reserve bank of India. The Central bank occupies a strategic position in the money market. The money market can obtain funds from the central bank either by borrowing or through sale of securities. In addition, the money market is a wholesale market. The volumes are very large and generally transactions are settled on a daily basis. Trading in the money market is conducted over the telephone followed by written confirmation from both the borrowers and lenders.

**Functions of Money Market**

Money market performs the following functions:

1. Facilitating adjustment of liquidity position of commercial banks, business undertakings and other non-banking financial institutions.
2. Enabling the central bank to influence and regulate liquidity in the economy through its intervention in the market.
3. Providing a reasonable access to users of short term funds to meet their requirements quickly at reasonable costs.
4. Providing short term funds to government institutions.
5. Enabling businessmen to invest their temporary surplus funds for short period.
6. Facilitating flow of funds to the most important uses.
7. Serving as a coordinator between borrowers and lender of short term funds.
8. Helping in promoting liquidity and safety of financial assets.

**Money Market Instruments**

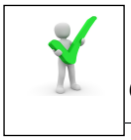
Money market is involved in buying and selling of short term instruments. It is through these instruments, the players or participants borrow and lend money in the money market. There are various instruments available in the money market. The important money market instruments are:-

1. Call and short notice money
2. Commercial bills
3. Treasury bills
4. Certificate of deposits
5. Commercial papers
6. Repurchase agreements
7. Money market mutual funds.
8. ADR/GDR

## 4.11 FINANCIAL SERVICES

The development of a sophisticated and matured financial system in the country, especially after the early nineties, led to the emergence of a new sector. This new sector is known as financial services sector. Its objective is to intermediate and facilitate financial transactions of individuals and institutional investors. The creators of financial services are the financial intermediaries such as banks, mutual funds, insurance companies, stock exchanges. Financial intermediaries provide the services such as merchant banking, underwriting, leasing, hire purchasing and credit rating. Financial services are very important for creation of firms, industrial expansion and economic growth.

The investors who lend money wanted assurance that it is safe to exchange securities for funds. The financial regulators who regulate the financial market and intermediaries provides this assurance. Such kind of control increases the confidence of investors, which, in turn, help in the growth and development of financial system. Regulation is not necessary to develop a system but a system once developed needs to be regulated. The RBI regulates the money market and SEBI regulates the capital market.



***Check Your Progress-B***

**Q1. What are the financial institutions?**

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**Q2. Describe briefly various financial intermediaries in India.**

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**Q3.What is financial market? Briefly discuss about various types of Financial Market.**

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**Q4. Discuss money market instruments.**

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**Q5. What are the main financial services?**

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# 4.12 GROWTH AND DEVELOPMENT OF INDIAN FINANCIAL SYSTEM

At the time of independence in 1947, the Indian Financial System was semi-organised and there was no strong financial institutional mechanism in the country. The industrial sector

was not so developed as it had no access to the savings of the community. The capital market was primitive and shy. The development of Indian Financial System started with the inception of planning in the country. After independence, the government of India adopted mixed economic system. A scheme of planned economic development was evolved in 1951 with a view to achieve the broad economic and social objective. The government started creating new financial institutions in the public sector to supply finance both for agricultural and industrial development. It also nationalise some of the existing financial institutions so that the flow of finance might be in the right direction. The following developments took place in the Indian financial system:

1**. Nationalisation of financial institutions**: RBI, the leader of the financial system, was established as a private institution in 1935 and it was brought under government control in 1948. Next was the Imperial bank of India and its name was changed and was re-named State Bank of India. All this process was in 1956. In the same year, 245 life insurance companies were consolidated and merged and come under government control. As a result, Life Insurance Corporation of India came into existence on 1st September, 1956. Another important development has taken place in 1969 when 14 major commercial banks were nationalised. In 1980, 6 more banks were nationalized. Another landmark was the nationalisation of general insurance business and setting up of General Insurance Corporation in 1972.

2**. Establishment of Development Banks:** Another significant development of Indian financial system is the establishment of new development banks to supply institutional credit to industries. In 1949, RBI undertook a detailed study to find out the need for specialized institutions. The development bank era started in India in 1948 with the establishment of Industrial Finance Corporation of India (IFCI). In 1951, Parliament passed State Financial Corporation Act. Under this Act, State Governments could establish financial corporation's for their respective regions. The Industrial Credit and Investment Corporation of India (ICICI) were set up in 1955 and it was the pioneer for its participation in the private corporate sector. It was supported by Government of India, World Bank etc. The UTI was established in 1964 as a public sector institution to channelize the savings of the people to the productive ventures. In July 1964 The Industrial Development Bank of India (IDBI) was established as a wholly owned subsidiary of the RBI. Later the IDBI was delinked from RBI and It became an apex financial institution to provide finance and to co-ordinates the activities of all other financial institutions. In 1971, the IDBI and LIC jointly set up the Industrial Reconstruction Corporation of India (IRCI) with the objective of rehabilitation of sick industrial undertakings. In 1982, the Export-Import Bank of India (EXIM Bank) was set up to provide financial assistance to exporters and importers. On April 2, 1990 the Small Industries Development Bank of India (SIDBI) was set up as a wholly owned subsidiary of IDBI. The SIDBI has taken over the responsibility of administrating the Small Industries Development Fund and the National Equity Fund.

3**. Establishment of Institution for Agricultural Development:** The development of institutional credit for boosting rural economy was the priority for government of India from

the early years of planning. So at the insistence of the government of India RBI constituted a committee to review the arrangements for the institutional credit for the agriculture and rural development. The committee was formed on 30th March 1979 and it submitted its report in 28th November 1979. The report recommended the need of new organisational institution which provide undivided attention, forceful direction and completely focused on the credit related issues linked to the rural development. On the basis of its recommendations National Bank for Agriculture and Rural Development (NABARD) was set up in 1982. The main objective of the establishment of NABARD is to extend short term, medium term and long term finance to agriculture and allied activities.

4. **Establishment of institution for housing finance:** The National Housing Bank (NHB) has been set up in July 1988 as an apex financial institution to mobilise resources for the housing sector and to promote housing finance institutions both at local and regional levels.

5. **Establishment of Stock Holding Corporation of India (SHCIL):** In 1987, India's largest custodian and depository participant institution, Stock Holding Corporation of India Ltd. was set up to strengthen the stock and capital markets. It is known for to provide quick share transfer facilities, clearing services, support services etc. to investors.

6. **Establishment of mutual funds and venture capital institutions**: Mutual funds refer to the funds raised by asset management companies by pooling the savings of the public and investing them in a diversified portfolio. They provide wide range of investment avenues for small investors who cannot participate in the equities of large cap companies. Venture capital is a long term risk capital to finance high technology projects. The IDBI venture capital fund was set up in 1986.

## 4.13 WEAKNESSES OF INDIAN FINANCIAL SYSTEM

Even though Indian financial system is more developed today, it suffers from certain weaknesses. These may be briefly stated below:

1. **Lack of co-ordination among financial institutions:** There are a large number of financial intermediaries. Most of the financial institutions are owned by the government. At the same time, the government is also the controlling authority of these institutions. As there is multiplicity of institutions in the Indian financial system, there is lack of co-ordination in the working of these institutions.

2. **Dominance of development banks in industrial finance:** The industrial financing in India today is largely through the financial institutions set up by the government. They get most of their funds from their sponsors. They act as distributive agencies only. Hence, they fail to mobilise the savings of the public. This stands in the way of growth of an efficient financial system in the country.

3. **Inactive and erratic capital market**: In India, the corporate customers are able to raise finance through development banks. So, they need not go to capital market. Moreover, they

do not resort to capital market because it is erratic and inactive. Investors too prefer investments in physical assets to investments in financial assets.

4. **Unhealthy financial practices:** The dominance of development banks has developed unhealthy financial practices among corporate customers. The development banks provide most of the funds in the form of term loans. So there is a predominance of debt in the financial structure of corporate enterprises. This predominance of debt capital has made the capital structure of the borrowing enterprises uneven and lopsided. When these enterprises face financial crisis, the financial institutions permit a greater use of debt than is warranted. This will make matters worse.

5. **Monopolistic market structures**: In India some financial institutions are so large that they have created a monopolistic market structures in the financial system. For instance, the entire life insurance business is in the hands of LIC. The weakness of this large structure is that it could lead to inefficiency in their working or mismanagement. Ultimately, it would retard the development of the financial system of the country itself.

6. **Other factors:** Apart from the above, there are some other factors which put obstacles to the growth of Indian financial system. Examples are:

a. Banks and Financial Institutions have high level of NPA.

b. Government burdened with high level of domestic debt.

c. Cooperative banks are labelled with scams.

d. Investors confidence reduced in the public sector undertaking etc.,

e. Financial illiteracy.

## 4.14 SUMMARY

In this unit we have read so far that financial system plays a very important role in the economic development of a country. It intermediates between the savers of funds and investors of funds. Thus, it mobilizes and usefully allocates the scarce sources of country. Financial system is a complex, well integrated set of sub- systems of financial instruments, financial institutions, financial market and financial services which allocate and transfer the funds efficiently and effectively. Financial institutions are the intermediaries. Their role is to channelize the savings into investments in an efficient manner. Financial markets are a mechanism enabling participants to deal in financial claims. Financial markets are further categorises in capital market and money market. SEBI regulates the capital market and RBI regulates money market. Financial services are those that help with borrowing and funding, lending and investing, buying and selling securities, making and enabling payments and settlements and managing risk exposure in financial markets. Whereas financial instruments are comes into existence to enable transfer of savings for investments. Financial instruments

are classified as equity, debt, deposits, units, insurance policies etc. Before independence Indian financial system was semi-organised but after independence the development of Indian financial system started with the inception of planning in the country.

## 4.15 GLOSSARY

**Financial system**: It is defined as a set of institutions, instruments and markets which promotes savings and channels them to their most efficient use.

**Financial markets**: Financial markets are the centres or arrangements that provide facilities for buying and selling of financial claims and services.

**Intermediary:** A person or firm who acts to bring together supply and demand from two other firms or persons.

**Financial assets**: Financial assets such as fixed deposits with banks, small saving instruments with post offices, insurance/provident/pension fund etc. or securities market related instruments like shares, bonds, debentures etc.

## 4.16 REFERENCES


- Bharti Pathak.(2017). Indian Financial System: Pearson India Education Services Pvt. Ltd.
- Donald E. Fischer, Ronald J. Jordan (2009). Security analysis and Portfolio management: Pearson Education ,Inc.
- D.K Murthy, Venugopal (2006) . Indian Financial System: I K International Publishing house ltd.
- Edwin J.Elton, Martin J.Gruber (2002). Modern Portfolio Theory and Investment Analysis: John Wiley and Sons
- Francis Cherunilam (2006). Business Environment : Himalaya Publishing House Pvt. House Ltd
- HR Machiraju(2006) Indian Financial System :Vikas Publishing House Pvt Ltd
- MY Khan.(2016). Indian Financial System: McGraw Hill Education (India) Private Ltd.
- Preeti Singh (2003).Investment Management: Himalaya Publishing House Pvt. House Ltd

- R.M.Srivastava, Divya Nigam (2013). Management of Indian Financial Institutions: Himalaya Publishing Pvt. House Ltd.
- Vasant Desai (2010). Fundamental of the Indian Financial System New Challenges, New Initiatives : Himalaya Publishing House Pvt. House Ltd
- V.K Bhalla (2011).Investment Management , Security analysis and portfolio management :S.Chand & Company Ltd.
- https://www.google.com/search?q=structure+of+indian+financial+system&client=firefox-b-d&sxsrf


## 4.17 SUGGESTED READINGS


1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.


## 4.18 TERMINAL QUESTIONS

Q1. Explain the financial structure of India. What legislative measures have strengthened its financial system?

Q2. Discuss the developments that have been taken place in the Indian financial system.

Q3. What are the characteristics and functions of Financial Market?

# UNIT 5 SOURCES OF LONG TERM AND SHORT TERM FINANCE



## 5.1 INTRODUCTION

Finance is the lifeblood of an enterprise, because it is interlinked with all activities performed by the business enterprises. In a human body, if blood circulation is not proper, body function will stop. Similarly, if the finance is not being properly arranged, no enterprises can definitely accomplish its objectives. Every business organisation whether big, medium and small needs finance to carry on its operations and also to meet its day to day expenses. Capital required for business can be classified under two main categories i.e.

1) Fixed Capital
2) Working Capital

Every business needs funds for two purposes- for its establishment and to carry out its day-to-day operations. Long-term funds are required to create production facilities through the purchase of plants, machinery, furniture, land, building etc. The investment required for these fixed assets is called fixed capital. Funds are also required for short term purposes such as for

the purchase of raw material, payment of wages and other day to day expenses etc. these funds are known as working capital.

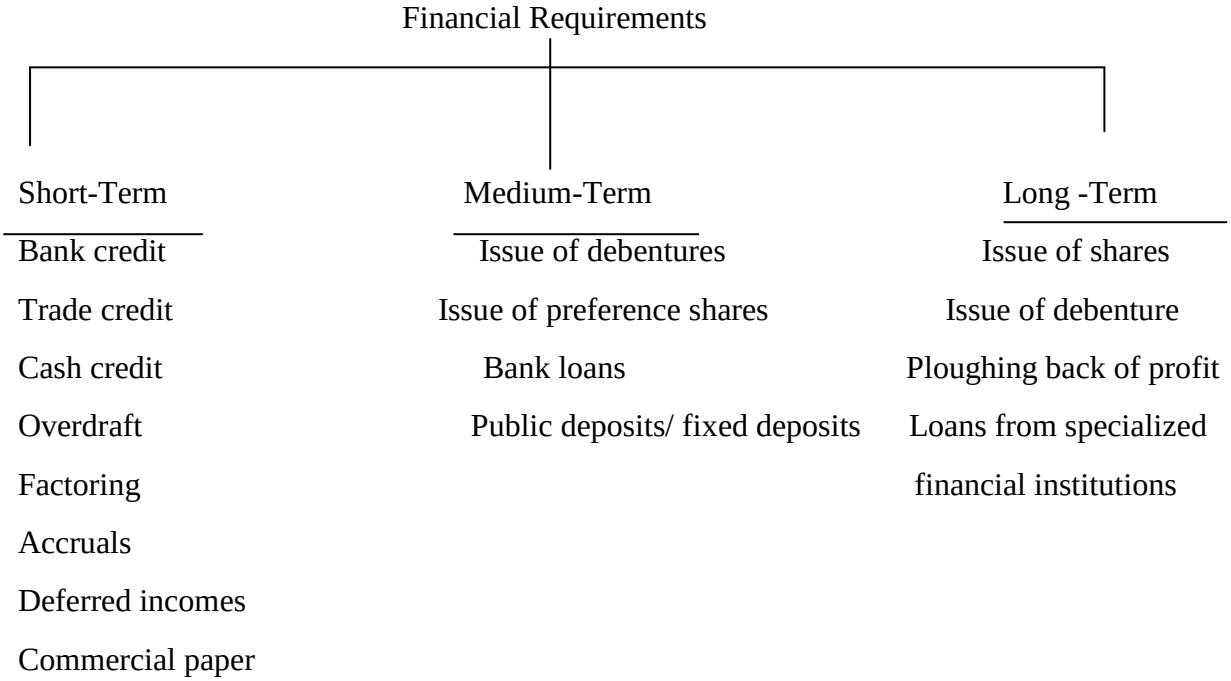



**Fig 5.1 Financial Requirements**

The various sources of raising long term funds are equity share capital, preference share capital, debentures, long term loans from banks etc. The short term sources of funds are banks, trade credit, cash credit, overdraft, factoring or receivable credit, accruals, deferred incomes, commercial paper etc.

In present unit you will study about the various short term sources of finance and long term sources of finance.

## 5.2 LEARNING OBJECTIVES

After reading this unit, you should be able to

- Explain the meaning and purpose of long term finance and short-term finance.
- Identify the various sources of long term finance and short-term finance
- Define equity shares and preference shares.

## 5.3 LONG TERM FINANCE – ITS MEANING AND PURPOSE

Every business organisation requires funds to buy fixed assets like land, building, plant, machinery, furniture etc. These assets may be regarded as the foundation of a business. The capital required for fixed assets is called **fixed capital**. A part of the working capital is also of

a permanent nature. Funds required for this part of the working capital and for fixed capital are called long term finance.

A financial requirement of every business concern is differ from other firm. The funds may be required for the long period or the short period. Long-term financial requirement means the finance needed to acquire land and building for business concern, purchase of plant and machinery and other fixed expenditure. Hence, it is also called a capital expenditure.

**Purpose of long term finance:**

Long term finance is required for the following purposes:

**1. To Finance fixed assets:**

Business requires fixed assets for its operations. Funds required to buy these assets is for a long term period, because such assets can be used for a long period and are not for resale.

**2. To finance the permanent part of working capital:**

Business is an ongoing activity. It must have a certain amount of working capital which would be needed again and again. This part of working capital is of a fixed or permanent nature. This requirement is also met from long term funds.

**3. To finance growth and expansion of business:**

Expansion of business requires investment of a huge amount of capital permanently or for a long period.

## 5.4 SOURCES OF LONG TERM FINANCE

The main sources of long term finance are as follows:

- **Equity Shares**
- **Preference Shares**
- **Debentures**
- **Retained Earnings or Ploughing back of Profits**

Let's study one by one in detail.

## 5.5 EQUITY SHARES

Issue of shares is the main source of long term finance. Shares are issued by joint stock companies to the public. A company divides its capital into units of a definite face value, say of Rs. 10 each or Rs. 100each. Each unit is called a share. A person holding shares is called a shareholder. **Equity Shares** also known as ordinary shares. The holders of these shares are the real owners of the company. They have a control over the working of the company. Equity shareholders are eligible to get dividend and dividend is paid to them after the payment to preference shareholders. The rate of dividend on equity shares is not fixed as its depend upon the profits of the company. The equity shareholders take more risk than

preference shareholders. In case of bankruptcy equity capital is paid to equity shareholders after meeting all other claims including that of preference shareholders. They take risk of both dividend and share capital

**Characteristics of Equity Shares**

**1. Maturity:** Equity shares provide permanent nature of capital to the company, which has no maturity period. It cannot be redeemed during the life time of the company.

**2. Claim on Income:** Equity shareholders have a residual claim on the income of a company. They have a right to get income left after paying fixed rate of dividend to preference shareholders. The earnings or the income available to the shareholders is equal to the profit after tax minus preference dividend. In many cases, they may not get anything if profits are insufficient, or may get even a higher rate of dividend.

**3. Claims on Assets:** If the company wound up, the ordinary or equity shareholders have the right to get the claims on assets. These rights are only available to the equity shareholders.

**4. Right to Control or Voting Rights:** Equity shareholders are the real owners of the company. They have voting rights in the meeting of the company. With the help of voting right power; they can change or remove any decision of the business concern. Equity share holders only have voting rights in the company meeting and also they can nominate proxy to participate and vote in the meeting instead of the shareholder.

**6. Pre -emptive Right:** Equity shareholder pre-emptive rights. The pre-emptive right is the legal right of the existing shareholders. It is attested by the company in the first opportunity to purchase additional equity shares in proportion to their current holding capacity.

**7. Limited liability:** Equity shareholders are having only limited liability to the value of shares they have purchased. If the shareholders are having fully paid up shares, they have no liability.

**Advantages of Equity Shares**

**1. Permanent sources of finance:** Equity share capital is belonging to long term permanent nature of sources of finance; hence, it can be used for long-term or fixed capital requirement of the business concern.

**2. Voting rights:** Equity shareholders are the real owners of the company who have voting rights. This type of advantage is available only to the equity shareholders.

**3. No fixed dividend:** Equity shares do not create any obligation to pay a fixed rate of dividend.

**4. Less cost of capital:** Cost of capital is the major factor, which affects the value of the company. If the company wants to increase the value of the company, they have to use more share capital because, it consists of less cost of capital (Ke) while compared to other sources of finance.

**5. Retained earnings:** When the company have more share capital, it will be suitable for retained earnings which are the less cost sources of finance while compared to other sources of finance.

**Disadvantages of Equity Shares**

**1. Irredeemable:** Equity shares cannot be redeemed during the life time of the business concern. It is the most dangerous thing of over capitalization.

**2. Obstacles in management:** Equity shareholder can put obstacles in management by manipulation and organizing themselves. Because, they have power to contrast any decision which are against the wealth of the shareholders.

**3. Leads to speculation:** Equity shares dealings in share market lead to secularism during prosperous periods.

**4. Limited income to investor:** The Investors who desire to invest in safe securities with a fixed income have no attraction for equity shares.

**5. No trading on equity:** When the company raises capital only with the help of equity, the company cannot take the advantage of trading on equity.

## 5.6 PREFERENCE SHARES

Preference Shares are the shares which carry preferential rights over the equity shares. These rights are (a) receiving dividends at a fixed rate, (b) getting back the capital in case the company is wound-up. Investment in these shares is safe, and a preference shareholder also gets dividend regularly.

Preference shares may be classified into the following major types:

**1. Cumulative preference shares**

Cumulative preference shares have right to claim dividends for those years which have no profits. If the company is unable to earn profit in any one or more years, C.P. Shares are unable to get any dividend but they have right to get the comparative dividend for the previous years if the company earned profit.

**2. Non-cumulative preference shares**

Non-cumulative preference shares have no right to enjoy the above benefits. They are eligible to get only dividend if the company earns profit during the years. Otherwise, they cannot claim any dividend.

**3. Redeemable preference shares**

When, the preference shares have a fixed maturity period it becomes redeemable preference shares. It can be redeemable during the lifetime of the company. The Company Act has provided certain restrictions on the return of the redeemable preference shares.

**4. Irredeemable Preference Shares**

Irredeemable preference shares can be redeemed only when the company goes for liquidator.

There is no fixed maturity period for such kind of preference shares.

**5. Participating Preference Shares**

Participating preference shareholders have right to participate in extra profits after distributing the equity shareholders.

**6. Non-Participating Preference Shares**

Non-participating preference shareholders are not having any right to participate extra profits after distributing to the equity shareholders. Fixed rate of dividend is payable to the type of shareholders.

**7. Convertible Preference Shares**

Convertible preference shares holders have right to convert their holding into equity shares after a specific period. The articles of association must authorize the right of conversion.

**8. Non-convertible Preference Shares**

There shares, cannot be converted into equity shares from preference shares.

**Features of Preference Shares**

The common features of preference shares are given below:

**1. Maturity:** Generally, preference shares resemblance equity shares in respect of maturity. So they have no fixed maturity period except in the case of redeemable preference shares. At the time of liquidation of company preference shareholder are paid after paying the creditors but before paying the equity shareholders.

**2. Claims on income:** Preference shareholders have prior claims on income over the equity shareholders. A fixed rate of dividend is payable on preference shares.

**3. Claims on assets:** Preference shares have a preference in repayment of capital at the time of liquidation of a company. At the time of winding up of the company their claim settled first before making payment to the equity shareholders.

**4. Control:** Preference shareholders do not have any voting rights, so they do not have any say in the management of the company.

**5. Hybrid form of security:** Preference shares, in real sense are the hybrid form of security as it includes some features of equity and other of debt financing. It resembles the equity in the sense 1) payment of dividend is not compulsory 2) dividend is payable out of the profits only.3) it is not deductible as an expense while determining tax liability of the company. On the other hand it has some features of debt financing also 1) it carries fixed rate of dividend. 2) It entitles to a right to its holder prior to equity shareholders 3) it does not carry voting right.

**Advantages or Merits of Preference Shares**

Preference shares provide number of advantages which are given below.

**1. Fixed Dividend:** Preference shareholders earn fixed rate of dividend. It is also called as fixed income security because it provides a constant income to the investors.

**2. Cumulative Dividends:** Preference shares provide cumulative dividends which means that if in any year company does not have profits the company does not earn any profit in any previous years; it can be cumulative with future period dividend.

**3. Redemption:** Preference Shares can be redeemable after a specific period except in the case of irredeemable preference shares. There is a fixed maturity period for repayment of the initial investment.

**4. Participation:** Participative preference shares holders can participate in the surplus profit after distribution to the equity shareholders.

**5. Convertibility:** Convertible preference shares can be converted into equity shares when the articles of association provide such conversion.

**Disadvantages of Preference Shares**

**1. Expensive sources of finance:** Preference shares are expensive source of finance compared to equity shares.

**2. No voting right:** Generally preference shareholders do not carry voting rights. Hence they have no say in the management of the company.

**3. Fixed dividend only:** Preference shareholders get only fixed rate of dividend. They may not enjoy more profits of the company.

**4. Permanent burden:** Cumulative preference shares become a permanent burden so far as the payment of dividend is concerned. Because the companies have to pay dividend for the un profitable years also.

**5. Taxation:** In the taxation point of view, preference shares dividend is not a deductible expense while calculating tax. But, interest is a deductible expense. Hence, it has disadvantage on the tax deduction point of view.

## 5.7 DEBENTURES OR BONDS

Whenever a company wants to raise long term finance, it can borrow from the general public by issuing loan certificates called Debentures. Debentures are the acknowledgement of debt. According to Thomas Evelyn, "A debenture is a document under the company's seal which provides for the payment of a principal sum and interest thereon at regular intervals, which is usually secured by a fixed or floating charge on the company's property or a loan to the

company". A debenture holder is termed as the creditor of the company. A fixed rate of interest is paid on the debentures.

**Characteristics of Debenture**

Following are the characteristics of Debentures:

i) Debenture holders are the creditors of the company. They are entitled to periodic payment of interest at a fixed rate.

ii) Debentures are repayable after a fixed period of time, say five years or seven years as per agreed terms.

iii) Debenture holders do not carry voting rights.

iv) Ordinarily, debentures are secured. In case the company fails to pay interest on debentures or repay the principal amount, the debenture holders can recover it from the sale of the assets of the company.

**Types of Debentures**

Debentures may be divided into the following major types:

**1. Unsecured debentures:** Unsecured debentures are not given any security on assets of the company. It is also called simple or naked debentures. This type of debentures is treated as unsecured creditors at the time of winding up of the company.

**2. Secured debentures:** Secured debentures are given security on assets of the company. It is also called as mortgaged debentures because these debentures are given against any mortgage of the assets of the company.

**3. Redeemable debentures:** These debentures are to be redeemed on the expiry of a certain period. The interest is paid periodically and the initial investment is returned after the fixed maturity period.

**4. Irredeemable debentures:** These kinds of debentures cannot be redeemable during the life time of the business concern

**5. Convertible debentures:** Convertible debentures are the debentures whose holders have the option to get them converted wholly or partly into shares. These debentures are usually converted into equity shares.

**Conversion of the debentures may be:**

- Non-convertible Debentures
- Fully convertible debentures
- Partly convertible debentures

**6. Other types:** Debentures can also be classified into the following types.

Some of the common types of the debentures are as follows:

1. Collateral Debenture

2. Guaranteed Debenture

3. First Debenture

4. Zero Coupon Bond

5. Zero Interest Bond/Debenture

**Advantages of Debenture**

Debenture is one of the major parts of the long-term sources of finance which of consist the following important advantages:

**1. Long-term sources:** Debenture is one of the long-term sources of finance to the company. Normally the maturity period is longer than the other sources of finance.

**2. Fixed rate of interest:** Fixed rate of interest is payable to debenture holders, hence it is most suitable of the companies earn higher profit. Generally, the rate of interest is lower than the other sources of long term finance.

**3. Trade on equity:** A company can trade on equity by mixing debentures in its capital structure and thereby increase its earnings per share. When the company apply the trade on equity concept, cost of capital will reduce and value of the company will increase.

**4. Income tax deduction:** Interest payable to debentures can be deducted from the total profit of the company. So it helps to reduce the tax burden of the company.

**5. Protection:** Various provisions of the debenture trust deed and the guidelines issued by the SEB1 protect the interest of debenture holders.

**Disadvantages of Debenture**

In spite of many advantages, Debenture financing suffers from the following major disadvantages:

**1. Fixed interest:** The fixed interest payment every year and repayment of principal amount at the time of maturity is the legal obligations of the company. Hence, it is a permanent burden on the company and is not suitable to those companies whose earnings fluctuate considerably.

**2. No Voting Rights:** Debenture holders do not carry any voting rights. Hence, they cannot have any controlling power over the management of the company.

**3. Creditors of the company:** Debenture holders are merely creditors and not the owners of the company. They do not have any claim on the surplus assets and profits of the company beyond the fixed interest and their principal amount.

**4. High risk:** Every additional issues of debentures becomes more risky and costly on account of higher expectation of debenture holders. This enhanced financial risk increases the cost of equity capital and the cost of raising finance through debentures which is also high because of high stamp duty.

**5. Restrictions of further issues:** The Company cannot raise further finance through debentures as the debentures are under the part of security of the assets already mortgaged to debenture holders.

## 5.8 RETAINED EARNINGS OR PLOUGHING BACK OF PROFITS

The ploughing back of profits means that companies do not share all its profits among the shareholders as dividend rather some part of profit is kept aside. Such profit is retained or reinvested by the company for the its further development. Such a phenomenon is also called Self Financing, Internal Financing or Inter financing. Under this method, a part of total profits is transferred to various reserves such as General Reserve, Debenture Redemption Reserve and Dividend Equalisation Reserve etc. These reserves can be used to meet long term financial requirements. Sometimes secret reserve is also created without the knowledge of shareholders.

**Merits of Ploughing Back of Profits**

Following are the benefits of retained earnings:

**1. Economical Source of Capital:**

It acts as a very economical as there is no obligation on the part of the company either to pay interest or pay back the money. It can safely be used for expansion, growth and modernization of business.

**2. Financial stability:**

A company which has enough reserves can face ups and downs in business. Such companies can continue with their business even in depression, thus building up its goodwill.

**3. Benefits to the shareholders:**

Shareholders may get dividend out of reserves even if the company does not earn enough profit. Due to reserves, there is capital appreciation, i.e. the value of shares goes up in the share market.

**Limitations of Ploughing Back of Profits:**

The limitations of Ploughing Back of Profits are given below.

**1. Huge Profit:**

This method of financing is possible only when there are huge profits and that too for many years.

**2. Dissatisfaction among shareholders:**

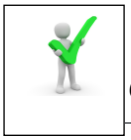
When funds accumulate in reserves, bonus shares are issued to the shareholders to capitalise such funds. Hence the company has to pay more dividends. By retained earnings the real capital does not increase while the liability increases. In case bonus shares are not issued, it may create a situation of under–capitalisation because the rate of dividend will be much higher as compared to other companies.

**3. Fear of monopoly:**

Through ploughing back of profits, companies increase their financial strength. Companies may throw out their competitors from the market and monopolize their position.

**4. Mis-management of funds:**

Capital accumulated through retained earnings encourages management to spend carelessly.



***Check Your Progress-A***

**Q1.What are the characteristics of equity shares?**

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**Q2. What are the advantages of preference shares?**

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**Q3. What is the need of ploughing back of profits?**

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**Q4. What are debentures?**

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**Q5. What are the convertible debentures?**

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## 5.9 OTHER POPULAR SOURCES OF LONG TERM FINANCE

### 1. Lease Financing

Lease financing is emerged as the popular and common methods of long term finance, in addition to debt and equity financing. Leasing is an arrangement which provides the firm with a use and control over assets without buying and owning the same. It is a form of renting asset. According to the equipment leasing association of UK definition, "leasing is a contract between the lessor and the lessee for hire of a specific asset selected from a manufacturers or vender of such assets by the lessee. The lessor retains the ownership of the asset. The lessee passes the possession and uses the asset on payment for the specified period".

### Elements of Leasing

**Parties:** These are essentially two parties to a contract of lease financing, namely the owner and user of the assets.

**Lesser:** Lesser is the owner of the assets that are being leased. Lessers may be individual, partnership, joint stock companies, corporation or financial institutions.

**Lessee:** Lessee is the receiver of the service of the assets under a lease contract.

**Lease broker**: Lease broker is an agent in between the lesser (owner) and lessee. He acts as an intermediary in arranging the lease deals. Merchant banking divisions of foreign banks, subsidiaries Indian banking and private foreign banks are acting as lease brokers.

**Lease assets**: The lease assets may be plant, machinery, equipments, land, automobile, factory, building etc.

### 2. Hire purchase

Hire purchase is a mode of financing the price of the goods to be sold on a future date. In a hire purchase transaction, the goods are let on hire, the purchase price is to be paid in instalments and hirer is allowed an option to purchase the goods by paying all the

instalments. Hire purchase is a method of selling goods. In a hire purchase transaction the goods are let out on hire by a finance company (creditor) to the hire purchase customer (hirer). The buyer is required to pay an agreed amount in periodical instalments during a given period. The ownership of the property remains with creditor and passes on to hirer on the payment of the last instalment.

**Features**

- Under hire purchase system, the buyer takes possession of goods immediately and agrees to pay the total hire purchase price in instalments.
- Each instalment is treated as hire charges.
- The ownership of the goods passes from the seller to the buyer on the payment of the last instalment.
- In case the buyer makes any default in the payment of any instalment the seller has right to repossess the goods from the buyer and forfeit the amount already received treating it as hire charges.
- The hirer has the right to terminate the agreement any time before the property passes. That is, he has the option to return the goods in which case he need not pay instalments falling due thereafter. However, he cannot recover the sums already paid as such sums legally represent hire charges on the goods in question.

**Leasing Versus Hire Purchase**

Both leasing and hire purchase are the source of financing. The two are not similar on many accounts. The following points of distinction are worth consideration from points of view of the lessee and the hirer:

| Point of Difference | Leasing | Hire Purchase |
|---|---|---|
| 1. Ownership | Ownership is not transferred to the lessee. | Ownership is transferred to the hirer on the payment of last instalment. |
| 2. Tax Deductibility | Lease rents are tax-deductible expense. | Only the interest and not the entire instalment is deductible. |
| 3. Salvage value | Lessee cannot realise the salvage value of the asset on the expiry of the lease of life of the asset. | Hirer can realise the salvage value of the asset after payment of last instalment and expiry of the life of the asset. |

### 3. Venture Capital

The term "Venture Capital" represents financial investment in a highly risky project with the objective of earning a high rate of return. It is a long-term financial assistance provided to projects, which are established to introduce new products, inventions, idea and technology. Venture capital finance is more suitable to highly risky projects which consists of huge investment and provides results after 5 to 7 year.

The term Venture Capital fund is usually used to denote Mutual funds or Institutional investors. They provide equity finance or risk capital to little known, unregistered, highly risky, young and small private business, especially in technology oriented and knowledge intensive business. Venture Capital termed as long-term funds in equity or semi-equity form to finance hi- tech projects involving high risk and yet having strong potential of high profitability.

### Features of Venture Capital

Venture Capital consists of the following important features:

(1) Venture Capital consists of high risk and high return based financing.

(2) Venture Capital financing is equity and quasi equity financing instruments.

(3) Venture Capital provides moderate interest bearing instruments.

(4) Venture Capital reduces the financial burden of the business concern at the initial stage.

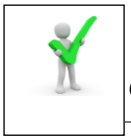
(5) Venture Capital is suitable for risky oriented and high technology based industry.

### 4. Private Equity

Private equity is a pooled investment vehicle used for making investments in various equity (and to a lesser extent debt) securities according to one of the investment strategies associated with private equity. Private equity is typically limited partnerships with a fixed term of 10 years (often with annual extensions).

### Features of private equity

- Equity holders can enjoy the benefits of acquiring majority or minority stakes.
- Usual duration of stay of private equity holder in business enterprises varies from 3 to 6 years.
- It takes around 3 months to complete usual transactions.



***Check Your Progress-B***

**Q1. Write a note on Lease Financing?**

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**Q2. What is Venture Capital?**

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**Q3. What are the features of Venture Capital?**

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**Q4. Difference between lease and hire purchase financing.**

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# 5.10 SHORT TERM SOURCES OF FINANCE

Once the business is established, it required funds to meet its day to day expenses. For example raw materials are required at regular intervals, wages to workers, water and power charges etc. Thus there is a continuous necessity of liquid funds to be available for meeting these expenses. For financing such requirements short-term funds are needed. Inadequacy of short-term funds may even lead to closure of business.

In this section, you will study about the various sources of short-term finance. The sources of short- term finance are given below.

**Sources of Short-term Finance:**

There are a number of sources of short-term finance which are listed below:

**1. Trade Credit**

Trade credit refers to credit extended to manufactures and traders by the suppliers of goods in normal course of business. Usually business enterprises buy supplies on a 30 to 90 days credit. It means that the goods are delivered to the buyers but payments to be received in

future as per terms of the sales invoice. This type of credit does not make the funds available in cash but it facilitates purchases without making immediate payment. This is quite a popular source of finance.

**2. Commercial Banks**

Commercial banks are the main source of short term finance to business firms. The major portion of short term finance is provided by the commercial banks. Banks provide various varieties of loans to meet the specific requirements of a concern. The different forms in which banks provide the loans and advances to the business concerns are given below.

**(i) Loans**

When a certain amount is advanced by a bank against some security it is called a loan. The loan is paid to the borrower either in cash or by credit to his account. The borrower is required to pay interest on the entire amount of loan from the date of its sanction. Commercial banks generally provides loan up to one year for meeting working capital requirements. Now- a -days, term loans exceeding one year is also provided by banks.

**(ii) Cash Credit**

It is an arrangement whereby banks allow the borrower to money up to a specified limit against some tangible securities or guarantees. This limit is known as cash credit limit and customer can withdraw from his cash credit limit according to his needs and he can also deposits amount when he has surplus of it. Initially this limit is granted for one year. This limit can be extended after review for another year. However, if the borrower still desires to continue the limit, it must be renewed after three years. Interest is charged only on the daily balance and not on the amount of entire limit.

**(iii) Overdraft**

When a bank allows its depositors or account holders to withdraw money more than the balance to his credit up to certain limit it is known as overdraft facility. This limit is granted purely on the basis of credit-worthiness of the borrower. Banks generally give the limit up to Rs.20, 000. In this system, the borrower has to show a positive balance in his account on the last Friday of every month. Interest is charged only on the overdrawn money. Rate of interest in case of overdraft is less than the rate charged under cash credit.

**(iv) Discounting of Bill**

Banks also advance money by discounting bills of exchange, promissory notes and hundies. When these documents are presented before the bank for discounting, banks credit the amount to cutomer's account after deducting discount. The amount of discount is equal to the amount of interest for the period of bill.

**3. Customers' Advances**

Sometimes businessmen asked their customers to make some advance payment. It is generally said when the order is quite large or things ordered are expensive. Customers' advance represents a part of the payment towards price on the product (s)which will be

delivered at a later date. Customers generally agree to make advances when such goods are not easily available in the market or there is an urgent need of goods. A firm can meet its short-term requirements with the help of customers' advances.

**4. Instalment credit**

Instalment credit is now-a-days a popular source of finance for consumer goods like television, refrigerators as well as for industrial goods. Under this system possession of goods are taken immediately but the payment is made in instalments over a pre-determined period of time. Interest is charged on the unpaid price or it may be adjusted in the price.

**5. Loans from Co-operative Banks**

Co-operative banks are a good source to procure short-term finance. Such banks have been established at local, district and state levels. District Cooperative Banks are the federation of primary credit societies. The State Cooperative Bank finances and controls the District Cooperative Banks in the state. They are also governed by Reserve Bank of India regulations. Some of these banks like the Vaish Co-operative Bank was initially established as a co-operative society and later converted into a bank. These banks grant loans for personal as well as business purposes. Membership is the primary condition for securing loan. The functions of these banks are largely comparable to the functions of commercial banks.

## 5.11 SUMMARY

Capital is the life blood of business. A business requires capital to purchase its fixed assets, which is called long term finance. The factors that determine the long term requirements of capital are: (i) Nature of business, (ii) Size of business, (iii) Kinds of goods produced, and (iv) Technology used.

The main sources of raising long term finance are: (i) Shares, (ii) Debentures (iii) Retained earnings, (iv) loans from financial institutions, and (v) term loans from banks. Share is an unit of capital of a company of a definite face value. Share indicates certain rights of its holder and the extent of his liability. Shares are mainly of two types: (i) Equity shares (ii) Preference shares.

Preference shares are the shares which carry preferential rights of receiving dividend and repayment of capital (in case the company is wound up) over other shares. Equity shares are shares which do not carry any preferential right. Holders of these shares are the real owners of the company. They get dividends only when dividend on preference shares has been paid. Issue of debenture is a source of borrowed capital. A debenture is a written acknowledgement of debt by a company. Debenture holders are the creditors of the company. They do not enjoy any voting rights. They are secured. Debentures may be (a) redeemable or irredeemable, and (b) convertible or non-convertible.

Retained earnings are a portion of profit, earned by an enterprise, set aside to finance its activities. It is also called ploughing back of profit or internal financing. Commercial banks

traditionally give loans for a short period. But recently they have started giving term loans both by extending the short-term loans and also directly for a long period.

Short-term finance is required by business firms to meet day to day expenses. It facilitates the smooth running of business operations. It enables holding of stocks of raw materials and finished products, helps to increase the volume of production at short notice and bridges the time gap between commencement of production and realisation of sales. There are a number of sources of short-term finance: (i) Trade Credit,(2) Bank credit including loans and advances, cash credit, overdraft and discounting of bills, (3) Customers' advances, (4) instalment credit, and(5) Loans from co-operative banks.

Short-term finance is helpful to business in meeting temporary requirements of funds without a heavy burden of interest. It is a flexible source of finance. When necessary, it may also serve long-term purposes through renewal. However interest has to be paid on short-term borrowing, irrespective of profit or loss. It also needs security of assets to be provided by the borrower.

## 5.12 GLOSSARY

**Financing:** Financing is the provision of capital to corporations, households, and governments for the purposes of investment

**Long-term finance:** Long-term finance/long-term financing are used interchangeably in this report. They refer to the provision of long-dated funds to pay for capital-intensive undertakings that have multiyear payback periods

**External financing:** External financing is the provision of capital from outside investors to corporations, households, and governments (for example, via bank loans or capital markets).

## 5.13REFERENCES


- Francis Cherunilam (2006). Business Environment: Himalaya Publishing House Pvt. House Ltd
- HR Machiraju(2006) Indian Financial System :Vikas Publishing House Pvt Ltd
- MY Khan.(2016). Indian Financial System: McGraw Hill Education (India) Private Ltd.

- Preeti Singh (2003).Investment Management: Himalaya Publishing House Pvt. House Ltd
- Parsana Chandra ( 2019) . Financial Management, Theory and Practice : Mc Graw Hill
- R.M.Srivastava, Divya Nigam (2013). Management of Indian Financial Institutions: Himalaya Publishing Pvt. House Ltd.
- Vasant Desai (2010). Fundamental of the Indian Financial System New Challenges, New Initiatives : Himalaya Publishing House Pvt. House Ltd
- V.K Bhalla (2011).Investment Management , Security analysis and portfolio management :S.Chand & Company Ltd.


## 5.14 SUGGESTED READINGS


1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.


## 5.15 TERMINAL QUESTIONS

Q1. Why does business need long term finance? Explain in brief.

Q2. Give the advantages and disadvantages of equity shares.

Q3. Differentiate between:

(a) Equity shares and preference shares

(b) Shares and Debentures

Q4. State the meaning of Debenture. Give the merits and demerits of debentures as a source of long term finance.

Q5. Define Retained Earnings. What are limitations of Retained Earning as a source of finance?

Q6. List out the various advantages and disadvantages of long term loans from commercial banks.

Q7. Why short-term finance is a necessity for business enterprises?

Q8. List the various sources of short-term finance.

# UNIT 6 VALUATION OF SECURITIES



## 6.1 INTRODUCTION

Valuation is the process that links risk and return to determine the worth of an asset. It can be applied to expected benefits from real/physical as well as financial to determine their worth at a given point of time. We will focus on valuation of two financial assets, namely, bonds/debentures and shares. The key inputs to valuation process are i) expected returns in terms of cash flows together with their timing and ii) risk in terms of the required return.

The value of an asset depends on the return (cash flow) it is expected to provide over the holding / ownership period. The cash flow stream can be (1) annual, (2) intermittent and (3) even onetime. In addition to total cash flow estimates, their timing/pattern (e.g. amount year-wise) is also required to identify the return expected from the bond/share. The required return is used in the valuation process to incorporate risk into the analysis. Risk denotes the chance that an expected cash flow would not be realized. The level of risk associated with a expected cash flow/return has a significant bearing on its value, that is, the greater the risk, the lower the value and vice versa. Higher risk can be incorporated into the valuation analysis by using a higher capitalization/ discount rate to determine the present value.

## 6.2 LEARNING OBJECTIVES

After reading this unit, you should be able to

- Understand the main characteristics of fixed income instruments.
- Discuss the time value concept.
- Describe basic discounted cash flow valuation model and its application to bonds.
- Learn valuations of equity instruments.
- Discuss their interpretation and applicability of valuation in the stock market.
- Compute and analyse share valuation through the most often used methods such as earnings valuation, cash flow valuation, book valuation and dividend valuation.

## 6.3 BOND: INTRODUCTION AND MEANING

Bonds are an important source of funds for the companies, government, municipality, public sector organizations who raise funds to finance variety of projects and activities. The position of a bond holder is totally different with that of an equity-holder. Whereas the former is creditor or we can say the partial lender to company the latter is the ultimate owner of the company. Although bond holders assume risk but that is much lower than the equity holders in the same organization. Bond investor also does not share in the growth of a company. If at some time company is not in a position to pay the interest to the bond holder in that case he has the right to sell the assets of the company and recover his principal. Another difference is that bonds usually have a defined term, or maturity, after which the bond is redeemed; whereas stocks may be outstanding indefinitely Bonds are the debt instruments bearing interest on maturity. In simple terms, organizations may borrow funds by issuing debt securities named bonds, having a fixed maturity period (more than one year) and pay a specified rate of interest (coupon rate) on the principal amount to the holders. Bonds have a maturity period of more than one year which differentiates it from other debt securities like commercial papers, treasury bills and other money market instruments.

## 6.4 BOND TERMINOLOGY

**Coupon** The periodic interest payment made by the issuer. When bonds were first developed, the bond certificate had detachable coupons that the investor would send to the issuer to receive each interest payment. The term still applies to payments, even though coupons are no longer used to redeem them.

**Coupon rate** The interest rate used to calculate the coupon amount the bond will pay. This rate is multiplied by the face value of the bond to arrive at the coupon amount.

**Face (par) value** The amount printed on the certificate. The face value represents the principal in the loan agreement, which is the amount the issuer pays at maturity of the bond.

**Maturity date** The date the loan contract ends. At this time, the issuer pays the face value to the investor who owns the bond.

Bonds are often referred to as *fixed income securities* because they have a fixed payout to the investor. Since the coupon rate is set before the sale of the bond, the investor knows the amount of the interest payments.

## 6.5 PROCESS FOR ISSUING BONDS

A simple example will illustrate the process for issuing bonds.

**Example** ABC Company needs capital to purchase a new piece of equipment for its operations. The company meets with financial advisors and investment bankers to discuss the possibilities of raising the necessary capital. They decide that a bond issue is the least expensive method for the company.

The process is as follows:

**1. ABC Company sets the maturity date and face value of the bonds.**

The bonds will have a maturity date of ten years from the date of issue and a face value of Rs.1,000. The company will issue as many bonds as it needs for the equipment purchase – if the equipment costs Rs.10,000,000 fully installed, then the company will issue10,000 bonds.

**2. Investment bankers set the coupon rate for the bonds.**

The investment bankers attempt to gauge the interest rate environment and set the coupon rate commensurate with other bonds with similar risk and maturity. The coupon rate dictates whether the bonds will be sold in the secondary market at facevalue or at a discount or premium. If the coupon rate is higher than the prevailing interest rate, the bonds will sell at a *premium*; if the coupon rate is lower than the prevailing interest rate, the bonds will sell at a *discount*.

**3. Investment bankers find investors for the bonds and issue them in the primary market.**

The investment bankers use their system of brokers and dealers to find investors to buy the bonds. When investment bankers complete the sale of the bonds to investors, they turn over the proceeds of the sale (less the fees for performing their services) to the company to use for the purchase of equipment. The total face value of the bonds appears as a liability on the company's balance sheet.

**4. The bonds become available in the secondary market.**

Once the bonds are sold in the primary market to investors, they become available for purchase or sale in the secondary market. These transactions usually take place between two investors – one investor who owns bonds that are no longer needed for his/her investment portfolio and another investor who needs those same bonds.

Bond structure

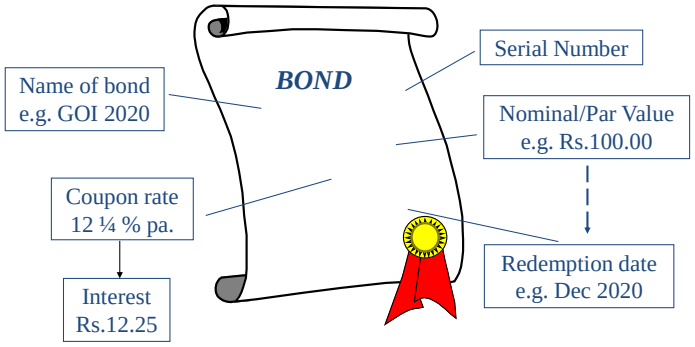



**Fig 6.1 Bond Structure**

# 6.6 VALUATION OF BONDS

**1. Current Yield**

**Current Yield** is a Bond Yield that is determined by dividing the fixed coupon amount (that is paid as a percentage on the face or original value of the specific bond) by the current price value of the particular bond. **In other words, Current Bond Yield = Coupon amount / current market price of a bond.**

**For example:**

The market price for a 8.24% G-Sec 2018 is Rs.118.85. The current yield on the security will be 0.0824 x 100 / 118.85 = 6.93 percent.

2.**Yield to Maturity** (YTM)

**Yield to Maturity** is the most popular measure of yield in the Debt Markets. YTM refers to the percentage rate of return paid on a bond, note or other fixed income security if the investor buys and holds the security till its maturity date.

The calculation for YTM is based on the coupon rate, the length of time to maturity and the market price of the bond. YTM is basically the Internal Rate of Return on the bond.

The yield or the return on the instrument is held till its maturity is known as the Yield-to maturity (YTM). Given a pre-specified set of cash flows and a price, the YTM of a bond is that rate which equates the discounted value of the future cash flows to the present price of the bond. It is the internal rate of return of the valuation equation. This is the most widely used yield calculation method.

Yield to maturity represents the yield on the bond, provided the bond is held to maturity and the intermittent coupons are re-invested at the same YTM rate. In other words, when we compute YTM as the rate that discounts all the cash flows from the bond, at the same YTM

rate, what we are assuming in effect is that each of these cash flows can be re-invested at the YTM rate for the period until maturity. The concept of Yield to maturity assumes that future cash flows are reinvested at the same rate at which the original investment was made.

Market price $\frac{I/2}{(1+r)}+\frac{I/2}{(1+r)^2}+\frac{I/2}{(1+r)^3}+\ldots\ldots\ldots\ldots\ldots\ldots\frac{\frac{I}{2}+FV}{(1+r)^n}$

Where;

I/2=annual interest ate payable half yearly

r=discount rate or YTM

n =number of half years remaining to maturity

The approximate Yield to maturity (YTM ) can be computed as per the formula given below;

YTM=$\frac{I+(F-M)/N}{(F+M)/2}$

Where

I = Annual Interest Rate

F= face Value of bond

M= market price of the bond

N Number of years to Maturity

Suppose Ramesh bus 12% 7 year GOI-2007 at Rs 102 and Suresh buys the same instrument at Rs104 then the yield to maturity using approximation is;

For Ramesh

YTM=$\frac{12+(100-102)/7}{(100+102)/2}$ =11.59%

For Suresh,

YTM=$\frac{12+(100-104)/7}{(100+104)/2}$ =11.20%

**3. Pricing of Bonds:**

Pricing a bond involves finding the present value of the cash flows from the bond throughout its life. The formula for calculating the present value of a bond is:

V = C[1 / (1+R)]1+ C[1 / (1+R)]2+ ... + C[1 / (1+R)]T+ F[1 / (1+R)]T

Where:

V = Present value of the bond

C = Coupon payment (coupon rate multiplied by face value)

R = Discount rate (current prevailing rate)

F = Face value of the bond

T = Number of compounding periods until maturity

**Example:**

What is the present value of a bond with a two-year maturity date, a face value of Rs.1,000, and a coupon rate of 6%? The current prevailing rate for similar issues is 5%. To apply the formula,

**C = Rs.60 (Rs.1,000 x 0.06), R = 0.05, T = 2, and F = Rs.1,000.**

**V = C[1 / (1+R)]1 + C[1 / (1+R)]2 + F[1 / (1+R)]2**

**V = Rs.60 [1 / (1+0.05)] + Rs. 60[1 / (1+0.05)]2 + Rs.1,000[1 / (1+0.05)]2**

**V = Rs.60 [0.95238] + Rs. 60[0.90703] + Rs.1,000 [0.90703]**

**V = Rs.57.14 + Rs.54.42 + Rs.907.03**

**V = Rs.1,018.59**

The present value of Rs.1,018.59 is the price that the bond will trade for in the secondary bond market. You will notice that the price is higher than the face value of Rs.1,000. In the time since these bonds were issued, interest rates have fallen from 6% to 5%. Investors are willing to pay more for the Rs.60 interest payments when compared with new bond issues that are only paying Rs.50 in interest per Rs.1,000 face value.

This inverse relationship is important.

**As interest rates fall, bond prices rise;**

**As interest rates rise, bond prices fall.**

A bond with a coupon rate that is the same as the market rate sells for face value. A bond with a coupon rate that is higher than the prevailing interest rate sells at a premium to par value; a bond with a lower rate sells at a discount.

## 6.7 TYPES OF RISK IN BONDS INVESTMENT

Investor who invests in financial instruments must be aware of the risk associated with particular instruments and its impact on his assets and financial capacity. Investing in bonds involve the following risks.

***Real Interest Rate Risk****:* Even is there is no inflation risk, borrowers and lenders are still exposed to the risk of change in the real interest rate. Shifts in supply and/or demand for funds will change the real rate of interest. To understand the implications of real interest rate risk consider an example. Suppose that the real interest rate falls from 6to4 percent because a

Combination of tax law changes and heightened competition drives down the real interest rate. In this case a firm that has borrowed funds at six percent real interest rate suffers. While is now earns only four percent on its assets, it has to pay six percent on its debt. Irrespective of whether it gains or losses from a change in the real rate of interest, a firm that has locked itself into a long-term debt at a fixed real cost can experience a dramatic impact whenever the real rate of interest changes. As such changes can scarcely be predicted, they represent a source of risk that borrowers and lenders have to face.

***Default Risk*****:** Default risk refers to the risk accruing from the fact that a borrower may not pay interest and / or principal on time. Other things being equal, bonds which carry a higher default risk (lower credit rating) trade at a higher yield to maturity. Put differently, they sell at a lower price compared to government securities which are considered free from default risk (as the government has the power to print money, it is believed that it will not default in honouring its commitments). Except in the case of highly risky debt instruments, referred to as junk bonds, investors seem to be more concerned with the perceived risk of default rather that the actual occurrence of default. Even though the actual default may be highly unlikely, they believe that a change in the perceived default risk of a bond would have an immediate impact on its market price.

***Call Risk:*** A bond may have a call provision that gives the issuer the option to call the bond

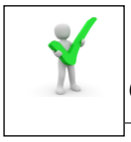
before its scheduled maturity. The issuer would generally exercise the call option when interest rates decline. While this is attractive from the issuer's point of view, it exposes the investors to call risk. Since bonds are typically called for prepayment after almost invariably have to accept a lower yield when they reinvest the amount received on premature redemption.

***Liquidity Risk:*** Barring some of the popular Government of India securities which are traded

Actively, most debt instruments do not seem to have a very liquid market. The market for debt is mainly an over-the counter market and much of the activity seems to investors face difficulty in trading debt instruments, particularly when the quantity is large. They may have to accept a discount over the quoted price while selling and pay premium while buying. This seems to be a major problem in certain segments of debt market – far bigger than most investors realize.

***Reinvestment Risk:*** When a bond pays periodic interest there is a risk that the interest payment may have to be reinvested at a lower interest rate. This is called *reinvestment risk.* There investment risk is greater for bonds with longer maturity and for bonds with higher interest payments.

***Foreign Exchange Risk****:* If a bond has payments that are denominated in a foreign currency its rupee cash flows are uncertain. The risk that the foreign currency will depreciate in relation to the Indian rupee is referred to as the foreign exchange risk (or currency risk).



***Check Your Progress-A***

**Q1. What is a bond?**

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**Q2. What is the yield on a bond?**

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**Q3. What is the difference between bond and debenture?**

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**Q4. What are the reasons of issuing bonds?**

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**Q5.How does an investor make money in bonds?**

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**Q6 .What are the risks of bonds?**

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# 6.8 EQUITY VALUATION

*Sai (Investor, aged 50 yrs): "I have Rs.20,000 with me. Instead of putting this money in my savings bank A/c where I get 3.5% p.a, I wish to invest into stock market. Can you suggest me a scrip which I can yield safe returns of say 5-6%?"*

*Investment advisor,: "As market has bottomed very drastically, I can suggest you plenty of blue chip scrips which are trading in the range of .4 to .6 of their book values with amazing P/E multiple of 2-4.They have good dividend track record too. If you consider average amount of dividend regularly paid by these companies, some of these companies carry a dividend yield of around 5-6%. This satisfies your criteria of safety and 5-6% yield. Say for ex. Allahabad Bank, a Govt. of India Enterprise. Its book value is Rs.134, EPS is Rs.17 and average dividend for last 6 years is 30%.Thus at current market price of mere Rs.37. Its P/BV is just .27and P/E is just 2.2 and mind blowing dividend yield of 8%.You must buy this stock''*

Therefore from the above it can be inferred that valuation of equity is very important for an investor. Therefore, lets us now learn various techniques of valuing equity.

# 6.9 EQUITY VALUATION TECHNIQUES

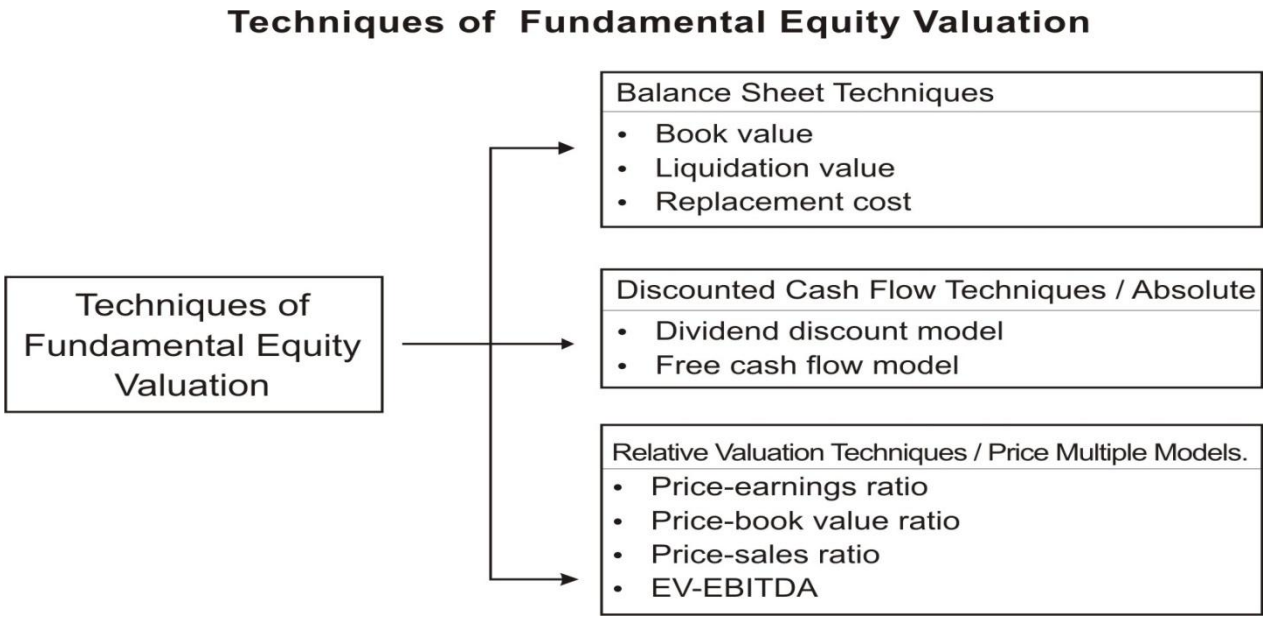


**Fig 6.2 Techniques of Equity Valuation**

**Balance Sheet Techniques:** Three measures derived from balance sheet are

1) **Book Value:** Book value is nothing but Net worth (Equity share capital plus reserve and surplus) of a company divided by total no. of outstanding equity shares. Thus this form of valuation is based on the books of a business, where owners' equity, is determined by a simple equation of total assets minus total liabilities and this is used to set a price. Companies whose stocks sell for less than book value are generally considered to be undervalued, or having less risk than companies selling for greater than book value. Because most companies sell for much more than book value, a company selling for less than book value may well have considerable upside potential. But the basic limitation of this value is that the book value doesn't reflect the true current economic value of the share. It also doesn't consider the future earnings potential of the company.

2) **Liquidation Value:** This approach is similar to the book valuation method, except that the liquidation value of assets are used instead of the book value of the assets. Using this approach, the liabilities of the business are deducted from the liquidation value of the assets to determine the liquidation value of the business. In simple words, The liquidation value of a company is equal to what remains after all assets have been sold and all liabilities have been paid. Liquidation value of an equity share is calculated by dividing liquidation value of the business by total no. of outstanding equity shares. Although it seems to be more realistic. The major problems in applying this method are - it is too difficult to estimate the liquidation value of the assets and secondly it doesn't consider the future earnings potential of the company. Thus it can be applied to dead companies rather than alive.

   For example – Valuation of a very sick textile company having a very huge land bank at prime locations. The share price of such company although making substantial losses can be much more than it's book value or say the share price of such company can be a positive although the book value is negative

3) **Replacement Cost:** Another theory related to equity valuation is that a firm cannot sell for much less or much more than the **replacement cost** of its assets less liabilities, which is quantified by the **Q ratio**, also known as **Tobin's Q**, because it was developed by James Tobin, who hypothesized that the total market value of all companies must be relatively equal to the replacement value of their assets minus their liabilities.

   For an individual company, the Q ratio is equal to the market price of the firm divided by its replacement cost.

Tobin's Q ratio Formula=Ratio of $\frac{Market\ Price\ of\ Firm}{Replacement\ cost}$

If individuals or companies want to enter a business, certainly it would be an important consideration whether they could buy a business for less than what it would take to replicate the company by starting from scratch, especially since bought out established company has revenue generation since day one.

If the Q ratio is significantly less than 1, then it would be cheaper for potential competitors to buy the firm rather than start a new business, so this would tend to increase its market price. If it is sold for significantly more than the Q ratio of 1, then competitors would enter the market, and drive down the price of the firm until it is approximately equal to 1.

As the replacement cost of a company would be difficult to ascertain quickly, the Q ratio cannot be a driving force in determining daily stock prices for companies. However, it could be an indicator for long-term trends and as a potential takeover target if the company's Q ratio is less than 1.

**Discounted cash flow/Absolute Techniques: T**he value of an asset is the present value of the expected future cash flows from that asset, discounted at a rate appropriate to the level of risk of the cash flows. Just like that, to determine the value of an equity, one needs to know the future cash flow to equity.

What is the future cash flow to equity? It is either in the form of dividends or in the form of operating cash flow. Thus these techniques include dividend discount model and Free Cash Flow Model

1) **Dividend Discount Model :** When valuing a stock, dividends are the most clear-cut way of defining cash flows; they're actual cash flows that go directly to the investor. Therefore, the value of equity share under this model is equal to present value of future dividends plus present value of expected sale proceeds of equity share.

**A) Single Period Valuation model –** Let us begin with the case where the investor expects to hold the equity share for one year. The price of equity share will be

$$P_0 = \frac{Div_1}{(1+r)} + \frac{P_1}{(1+r)}$$

For ex. – 1) Allahabad Bank is expected to give 3 Rs. dividend and fetch a price of Rs.57 at the end of a year? What should be its present price if investor expects to have 20% rate of return?

So $P_0 = \frac{3}{(1.2)} + \frac{57}{(1.2)}$

= Rs.50

Ex. 2) Current forecasts for Arvind Mills are dividends payments of Rs 5.6, Rs2.5, and Rs 7over the next three years, respectively. At the end of three years you anticipate selling this stock at a market price of Rs 98.36. What should be the price of the stock given a 12% expected return?

$$PV = \frac{5.6}{(1+.12)^1} + \frac{2.5}{(1+.12)^2} + \frac{7.00+98.36}{(1+.12)^3}$$

$$P0 = Rs.82.00$$

**B) Zero Growth Model:** If dividend per share remains constant year after year, the value of equity share will be

$$P_0 = \frac{\text{Div}_1}{1+r} + \frac{\text{Div}_2}{(1+r)^2} + \ldots = \frac{\text{Div}}{r}$$

$$\text{Zero Growth}: \; P_0 = \frac{\text{Div}}{r}$$

Where: P=the price at time 0

r=discount rate

For the sake of simplicity, consider a company with a Rs.2 annual dividend. If you figure the company will pay that dividend indefinitely, you must ask yourself what you are willing to pay for that company. Assume expected return, or, more appropriately in academic parlance, the 'required rate of return' is 5%. According to the dividend discount model, the company should be worth Rs.40.00 (Rs2 / .05).

**B) Constant Growth Model (Gordon Model) :**A model for determining the intrinsic value of a stock, based on a future series of dividends that has a current value of *D* and grows at a constant rate g in perpetuity. This model finds out the present value of the infinite series of future dividends which involves summing the infinite series which gives the value of current P.

This is known as the constant growth DDM or the Gordon Model after its creator, Myron Gordon. Let's take the same example. Here you assume one more fact that company's dividend will grow by 4% annually. The company's share value should then be Rs2 / (.05 - .04) = Rs 200.

Here is the formula for valuing a company with a constantly growing dividend, as well as the proof of the formula:

$$\text{Constant Growth: } P_0 = \frac{\text{Div}}{r-g}$$

$$P_0 = \frac{\text{Div}}{1+r} + \frac{\text{Div}(1+g)}{(1+r)^2} + \frac{\text{Div}(1+g)^2}{(1+r)^3} + \ldots = \frac{\text{Div}}{r-g}$$

**Few examples of Gordon Model:**

1) What is the value of a stock that expects to pay a Rs.4.00 dividend next year, and then increase the dividend at a rate of 8% per year, indefinitely? Assume a 12% expected return.

$$P_0 = \frac{Div_1}{r-g} = \frac{Rs.4.00}{.12-.08} = Rs.100$$

2) If the same stock is selling for Rs.200 in the stock market, what might the market be assuming about the growth in dividends?

$$Rs200 = \frac{Rs4.00}{.12-g}$$

$$g = .10$$

**D) Two Stage Dividend Discount Model**: This model assumes that dividends grow at one constant extraordinary rate during the first stage and then grow at a normal growth rate indefinitely. The valuation for such stock has got three steps 1) Present value of dividends in first stage 2) Present value of dividends in second stage (which is calculated based on Gordon Model) 3) The sum of these two values.

For ex.-- Consider X-pro Industries, According to an analyst, it is expected to pay Rs.1.16 annual dividend next year and is expected to grow 14% annually for the next four years subsequently. The analyst also expects the growth rate to stabilize at 7% thereafter. If an investor wants 10% rate of return. What should be the value of its equity share?

(Amount in Rs)

| Year | Dividend | Growth | Present value |
|---|---|---|---|
| 1 | 1.16 | | 1.05 |
| 2 | 1.32 | 14% | 1.09 |
| 3 | 1.51 | 14% | 1.13 |
| 4 | 1.72 | 14% | 1.17 |
| 5 | 1.96 | 14% | 1.22 |
| Perp | 2.10 | 7% | |

| | | | |
|---|---|---|---|
| Perp value | 70 | | 43.46 |
| | | | 49.12 |

Thus the value should be 49.12. If it is more than that, it is overvalued and vice versa.

**E) H Model** : The Gordon growth model implicitly assumes that growth will be stable forever. However, many companies grow at a faster than normal rate before slowing to this stable condition. In such cases, investors can use a multi-stage dividend discount model wherein the Gordon growth model is used to estimate the value once the company matures, but where interim cash flows are estimated using some other method. One such method is the H-model.

The H-Model assumes that growth begins at some super-normal rate, then the growth rate declines in a linear fashion until it reaches the normal rate. Under the H-Model, Value = D0(1 + gt)/(r - gt) + D0H(gs - gt)/(r - gt).

The left side of the equation is the Gordon growth model discounted to the present from time t. gt is the growth rate at time t. gs is the current super growth rate and H is the half-life of the expected high growth period.

Consider a potential investment in X-pro Industries. It pays a current dividend of Rs.1.16 per share. Its growth rate over the last five years has been 36%. Analysts expect that growth will slow from 36% pace to the 7% rate linearly over the course of next 10 years and will stabilize indefinitely. If an investor with a 10% required return wants to invest in X- pro, how much would that investor be willing to pay for a share today?

Using the H-Model, Value = 1.16(1.07)/(0.10 - 0.07) + (1.16 * 5)(0.36 - 0.07)/(0.10 - 0.07)

Value =1.24/0.03 + (5.80 * 0.29)/0.03 = 41.37 + 56.06 = Rs 97.43.

**F) Three Stage Dividend Discount Model: This** has an initial phase of stable high growth that lasts for a certain period. In the second phase the growth rate declines linearly until it reaches the final stable growth rate. This model improves upon both previous models and can be applied to nearly all firms.

For Ex. Analysts expect that X- pro Ind. is expected to declare dividend of Rs.**1.16 next year** and is expected to **grow at 14% p.a. for four years thereafter**. After 5 years the growth rate will slow from 14% pace to the 7% rate linearly over the course of 10 years and will stabilize at 7% thereafter. . If an investor with a 10% required return wants to invest in X- pro, how much would that investor be willing to pay for a share today?

First of all, we need to calculate the present value of the dividends for next five years-

| Year | Dividend | PV |
|---|---|---|
| 1 | 1.16 | 1.05 |
| 2 | 1.32 | 1.09 |
| 3 | 1.51 | 1.13 |
| 4 | 1.72 | 1.17 |
| 5 | 1.96 | 1.22 |
| Rs. 5.67 | | |

At the end of 5 years, the growth will slow at a linear rate for 10 years to a terminal growth rate of 7%.

The terminal value for second and third phase can be estimated using the two-stage H model = (1.96 * 1.07)/(0.10 - 0.07) + (1.96 * 5 * (0.14 - 0.07))/(0.10 - 0.07) = Rs.69.90 + Rs22.86 = **Rs.92.76**.

It is the value at the end of five years, so it must be discounted back to the present value @ 10%. The present value is thus Rs.92.76/1.10^5 =**Rs.57.60.**

**Adding the present value of the terminal value to the present value of the dividends for first 5 years, we get, Rs. 57.60 +Rs.5.67 = Rs.63.27 ( the value of a share )**

**G)** ***Multistage Dividend Discount Model*** **:**An equity valuation model that builds on the Gordon growth model by applying varying growth rates to the calculation. Under the multistage model, changing growth rates are applied to different time periods. Various versions of the multistage model exist including the two-stage, H, and three-stage models.

The two-stage model has an unstable initial growth rate, and can be either positive or negative. This initial phase lasts for a specified time and is followed by stable growth which lasts forever. The problem with this model is that the growth rate from the initial phase is assumed to change to the stable growth rate overnight.

The H-model has an initial growth rate that is already high, which then declines to a stable growth rate in a linear fashion over time.

Finally the three-stage model has an initial phase of stable high growth that lasts for a certain period. In the second phase the growth rate declines linearly until it reaches the a final stable growth rate. This model improves upon both previous models and can be applied to nearly all firms.

**2) The FCFE Discount Model :** Akin to the dividend discount model, with a significant change – FCFE replaces dividend in the models.The FCFE is a measure of what a firm can afford to pay out as dividends. Dividends paid are different from the FCFE for a number of reasons --

- Desire for Stability
- Future Investment Needs
- Tax Factors
- Signalling Prerogatives

A) **The Constant Growth FCFE Model:** The value of equity, under the constant growth model, is a function of the expected FCFE in the next period, the stable growth rate and the required rate of return.

$$P_0=\frac{FCFE_1}{r-g_n}$$

where,

$P_0$= Value of stock today

FCFE1 = Expected FCFE next year

r = Cost of equity of the firm

$g_n$= Growth rate in FCFE for the firm forever

B) **The Two-stage FCFE Model** :Like two stage dividend discount model, the value of any stock, here is the present value of the FCFE per year for the extraordinary growth period plus the present value of the terminal price at the end of the period.

Value = PV of FCFE + PV of terminal price

**C) The Three-stage FCFE Model :** It is like three stage dividend discount model where the investor expects a high growth period initially then linear downtrend known as transition period and the last phase is called the infinite stable growth period.

**Relative Valuation Techniques:** In relative valuation, we value an asset based upon how similar assets are priced. A prospective house buyer decides how much to pay for a house by looking at the prices paid for similar houses in the neighbourhood. Thus these techniques determine the share prices based upon shares of the similar companies in the same industry.

Relative valuation is much more likely to reflect the current mood of the market, since it attempts to measure relative. Thus, in a market where all internet stocks see their prices bid up, relative valuation is likely to yield higher values for these stocks than discounted cash flow valuations. In fact, by definition, relative valuations generally yield values that are

closer to market prices than discounted cash flow valuations, across all stocks. This is particularly important for those investors whose job it is to make judgments on relative value and who are themselves judged on a relative basis. Consider, for instance, managers of technology mutual funds. These managers will be judged based upon how their funds do relative to other technology funds. Consequently, they will be rewarded if they pick technology stocks that are undervalued relative to other technology stocks, even if the entire sector is overvalued.

The strengths of relative valuation are also its weaknesses. First, the ease with which a relative valuation can be put together, pulling together a multiple and a group of comparable firms, can also result in inconsistent estimates of value where key variables such as risk, growth or cash flow potential are ignored. Second, the fact that multiples reflect the market mood also implies that using relative valuation to estimate the value of an asset can result in values that are too high, when the market is over valuing comparable firms, or too low, when it is under valuing these firms. Third, while there is scope for bias in any type of valuation, the lack of transparency regarding the underlying assumptions in relative valuations makes them particularly vulnerable to manipulation. A biased analyst who is allowed to choose the multiple on which the valuation is based and to choose the comparable firms can essentially ensure that almost any value can be justified.

**1) P/E Ratio (Earnings Multiplier Approach):** A valuation ratio of a company's current share price compared to its per-share earnings.

Calculated as:

P/E Ratio = Market value per share / Earnings Per Share

For example, if a company is currently trading at Rs.50 a share and earnings over the last 12 months were 10 per share, the P/E ratio for the stock would be 5 ( 50/10).

EPS is usually from the last four quarters (trailing P/E), but sometimes ( for predicting the future value of the stock), it can be taken from the estimates of earnings expected in the next four quarters. A third variation uses the sum of the last two actual quarters and the estimates of the next two quarters.The value of a stock under this approach is estimated as follows,

P0 = E1 * P0/E1

Where P0 is the estimated value, E1 is the estimated earnings per share, and P0/E1 is the justified P/E Ratio

**2) Price To Book Value Ratio (P/BV Ratio) :**A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share. Also known as the "price-equity ratio".It is calculated as;

$$\text{PBV ratio} = \frac{\text{Market price per share at time } t}{\text{Book value per share at time } t}$$

A lower P/B ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company. As with most ratios, this varies from industry to industry for ex. This ratio is much lower in case of banking stocks as compared to technology (software ) sector. This ratio also gives some idea of whether the investor is paying too much for what would be left if the company goes bankrupt immediately.

3) **Price-To-Sales Ratio:** A ratio for valuing a stock relative to its own past performance, other companies or the market itself. Price to sales is calculated by dividing a stock's current price by its revenue per share for the trailing 12 months:

$$\text{PSR}=\frac{Share\ Price}{Revenue\ per\ share}$$

Let's consider how we evaluate a firm that has not made any money in the past year. Unless the firm is going out of business, the price-to-sales ratio will show if the firm's shares are valued at a discount against others in its sector. Say the company has a price-to-sales ratio of 0.5 while its peers have higher ratios of, say, 2.5. If the company can turn things around, its shares will enjoy substantial upside as the price-to-sales ratio becomes more closely matched with those of its peers. Meanwhile, a company that goes into a loss (negative earnings) may lose also its dividend yield. In this case, price-to-sales represents one of the last remaining measures for valuing the business. All things being equal, a low price-to-sales ratio is good news for investors, and a very high price-to-sales ratio can be a warning sign.

The price-to-sales ratio can vary substantially across industries; therefore, it's useful mainly when comparing similar companies. Because it doesn't take any expenses or debt into account, since the numerator, the price of equity, takes a firm's leverage into account, whereas the denominator, sales, does not. Comparing P/S ratios carries the implicit assumption that all firms in the comparison have an identical capital structure. This is always a problematic assumption, but even more so when the assumption is made between industries, since industries often have vastly different typical capital structures (for example, a utility vs. a technology company). This is the reason why P/S ratios across industries vary widely.

**4) Enterprise value to EBITDA (EBITDA Multiple):** A ratio used to determine the value of a company. The enterprise multiple looks at a firm as a potential acquirer would, because it takes debt into account - an item which other multiples like the P/E ratio do not include. Enterprise multiple is calculated as:

$$\text{Enterprise Multiple} = \frac{Enterprise\ Value}{EBITDA}$$

Also known as the EBITDA Multiple.

A low ratio indicates that a company might be undervalued. The enterprise multiple is used for several reasons;

1) It's useful for transnational comparisons because it ignores the distorting effects of individual countries' taxation policies.
2) It's used to find attractive takeover candidates. Enterprise value is a better metric than market cap for takeovers. It takes into account the debt which the acquirer will have to assume. Therefore, a company with a low enterprise multiple can be viewed as a good takeover candidate.
3) The enterprise multiples can vary depending on the industry. Therefore, it's important to compare the multiple to other companies or to the industry in general. One can expect higher enterprise multiples in high growth industries (like biotech) and vice versa.

**Quantitative Analysis – Value Added Concept:** When the firms are in expansion phase and want to raise the capital for their business, it is necessary for the investor to know how their investment would fetch the returns. Following are some of the important methods which assist the investor for the same.

**Economic Value Added – EVA** : A measure of a company's financial performance based on the residual wealth calculated by deducting cost of capital from its operating profit (adjusted for taxes on a cash basis). (Also referred as "economic profit".)

The formula for calculating EVA is as follows:

= Net Operating Profit After Taxes (NOPAT) - (Capital * Cost of Capital)

**Market Value Added - MVA** : A calculation that shows the difference between the market value of a company and the capital contributed by investors (both bondholders and shareholders). In other words, it is the sum of all capital claims held against the company plus the market value of debt and equity.

The higher the MVA, the better for the investor. A high MVA indicates the company has created substantial wealth for the shareholders. A negative MVA means that the value of

management's actions and investments are less than the value of the capital contributed to the company by the capital market (or that wealth and value have been destroyed).

## 6.10 SUMMARY

Valuation is the process that links risk and return to determine the worth of an asset. It can be applied to expected benefits from real/physical as well as financial to determine their worth at a given point of time. The key inputs to valuation process are i) expected returns in terms of cash flows together with their timing and ii) risk in terms of the required return. Bonds, do have risk. Changes that occur in the market interest rate affect the value of the bond. It is known as interest rate risk. Other than this, there are default risk, marketability risk and call ability risk.

Bonds refer to debt instruments bearing interest on maturity. In simple terms, organizations may borrow funds by issuing debt securities named bonds, having a fixed maturity period (more than one year) and pay a specified rate of interest (coupon rate) on the principal amount to the holders. Bonds have a maturity period of more than one year which differentiates it from other debt securities like commercial papers, treasury bills and other money market instruments.

Yield to maturity is the single discount factor that makes the present value of future cash flows from a bond equal to current price of the bond. Bond value theorem states that market price affects the yield and vice versa.

Equity shares carry with them ownership rights. They give voting rights to the holders. They have a face value (in monetary terms) at the time of issue and are evaluated at their market value when they are listed on a stock exchange. Equity valuation is a complex procedure since there is no consistent definition regarding what constitutes the intrinsic value of a share. Different valuation approaches and models with different assumptions and implications are available to investors to assess the true worth of a share. These include earnings approach, cash flow approach and dividend discount approach. An investor can choose the appropriate procedure of valuation for shares and make profits from the stock market.

## 6.11 GLOSSARY

**Par Value**: Par Value is the value stated on the face of the bond. Coupon Rate and Interest bond carries a specific interest rate which is called the coupon rate.

**Time value of Money**: Time value concept of money is that the rupee received today is more valuable than a rupee received tomorrow.

**Yield to Maturity (YTM)**: Yield to Maturity is the rate of return, which an investor can expect to earn if the bond is held till maturity.

**ZCBs**: Zero Coupon Bonds do not carry any coupon rate but are issued at a price discounted to the face value.

**Share valuation**: Share valuation is the process of assigning a value to a specific share. Price/Earnings (P/E) ratio relates the market price of a share with its earnings per share. Free cash flows are computed as cash from operations less capital expenditures.

## 6.12 REFERENCES


- Khan, M.Y. and Jain, P.K.,( 1992), Financial Management Text and Problems., Secongd Edition, Tata McGraw Hill Publishing Company Limited, New Delhi
- Pandey, I.M. (2010), Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi.
- "Prasanna Chandra (2006), Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition
- Sristava Rajiv and Mishra Anil (2016), Financial Management, Oxford University Press, New Delhi
- V .A Avadhani (2012). Securities Analysis and Portfolio Management, Himalaya Publishing House Pvt. Ltd.
- V.K Bhalla (2011).Investment Management,Security analysis and portfolio management :S.Chand & Company Ltd.
- Van Horne, James C. and Wachowicz, John M. Jr (2009), Fundamentals of Financial Management, 13th edition, Pearson Education Limited.


## 6.13 SUGGESTED READINGS

1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.

5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.

6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.

7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.

## 6.14 TERMINAL QUESTIONS

Q1. Discuss various risks in bond investment.

Q2. Explain various types of bonds.

Q3. Discuss the merits and limitations of the dividend discount model to valuation.

Q4. Discuss the merits and limitations of the dividend discount model to valuation.

Q5. A firm has issued 10%, 10 year bond with a Rs, 1000 par value, that pays interest annually, Compute the value of bond.

(Ans1000)

Q6. The bonds of the Premier Company Ltd (PCL) are currently selling at Rs.10, 800. Assuming (i) coupon rate of interest, 10 per cent, (ii) par value, Rs 10,000, (iii) maturity 10 years and (iv) annual interest payment, compute the YTM.

(Ans8.77% )

# Block II
# Financing Decisions

# UNIT VII COST OF CAPITAL



## 7.1 INTRODUCTION

In the previous block you learnt about concept, importance and relevance of financial management. You also learnt about the various sources of Long Term and Short Term Finance available for a company or a firm. However, raising funds from these sources attract some cost to the company. This cost is the rate of return that the company has to pay to the providers of funds. However, computational method for calculating cost for each source is different as different kind of investments carries different level of risk. But, calculating cost of each source of capital is important for a company as this cost of capital is required for capital budgeting and capital structure decisions. You will be able to assess relevance of this cost of capital for these decisions in subsequent units. The company's cost of capital can be measured by calculating specific cost which is financial payment that company incurs due to the use of specific cost of capital. Accordingly, in this unit, concept of cost of capital, methods for computing specific cost of capital and weighted average cost of capital are being explained.

## 7.2 UNIT OBJECTIVES

After reading this unit you will be able to;

- Calculate Cost of Debt.
- find Cost of Equity , Preference Shares and Retained Earning.
- learn the concept of weighted average cost of capital.

## 7.3 CONCEPT OF COST OF CAPITAL

The cost of capital is the minimum rate of return that is expected by the company to earn to meet the expectations of the equity shareholders or various categories of investors. The various sources of funds through which company raises funds are equity shares, debentures, term loans, bonds, retained earnings etc. The method for calculating cost for each source is different as different kind of investments carries different level of risk. This cost is the rate of return that needs to be offered to the fund providers in order to attract funds from them. The weighted arithmetic mean of the cost of various components of funds that a firm utilises is termed as cost of capital. It is also termed as hurdle rate or cut off rate, target rate, standard return etc. It is important for you to learn computation and importance of cost of capital as it is important for financial decision making. It is useful for providing a platform for evaluating the investment decisions as well for structuring debt-equity mix. Organizations use cost of capital to decide whether a capital project is worth to invest or not. Investors refer cost of capital to assess if an investment is worth the risk relative to the return or not. Therefore, cost of capital should be calculated on the actual basis for the specific components of cost of capital.

Let us know more about the cost of capital from the following definitions;

"Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditures." —Solomon Ezra

"A cut-off rate for the allocation of capital to investments of projects. It is the rate of return

on a project that will leave unchanged the market price of the stock." —James C. Van Horne

"The rate of return the firm requires, from investment in order to increase the value of the firm in the market place." —Hampton, John J

"Cost of raising funds is the minimum required rate of return of the firm i.e., the cost of capital is the minimum return which the firm must earn on the proposals in order to break even."- Rustagi R.P

Thus, as defined above, we can say, that cost of capital is the minimum rate of return that a firm should get so that it can maintain its market value of the shares and thereafter be able to maintain value of a firm. This discount rate is the opportunity cost the company incurs by investing in a project instead of investing in some other alternative having similar-risk investment. It basically it is minimum rate of return which is comprised of business risk and financial risk. Therefore, there are broadly two elements of cost of capital these are, a risk-

free rate of interest and a risk premium, which is the compensation an investor would receive for a perceived risk level. Business risk refers to the changes in EBIT due to changes in sale revenues whereas financial risk refers to the risk associated with the capital structure of financial plan of a business. Financial risk of a company shall be higher if the proportion of fixed cost bearings securities is higher in the capital structure. In such case, investor expects to be compensated for this increased risk level. In view of the above, the cost of capital may be calculated as;

K= $R_f$ +Business Risk Premium+ Financial risk premium

Rf being risk free rate

However, the measurement of a cost of capital does not have an exact procedure as it mainly depend on forecasting and estimation. Therefore, cost of capital so computed can be considered as just approximation of cost of capital. Accordingly, some practitioners consider cost of capital mere as an academic term.

## 7.3.1 IMPORTANCE OF COST OF CAPITAL

Cost of capital is required for financial decision making particularly for capital budgeting decisions as well as for capital structure planning and decision making. The cost of capital shall serve as a standard for the evaluation of Investment Decisions, for finalizing debt policy and for assessing the financial performance of the company.

Calculation of cost of capital is significant because of the following reasons;

1. **Evaluation of Investment decisions-** The cost of capital serves as a basis for comparing various investment alternatives. Cost of capital is used for discounting cash inflows that are used for evaluating the profitability of the Investment Proposals. In this context, overall cost of capital serves as hurdle rate as the acceptance criterion for the investment decision under the circumstances where current projects of the firm are of similar risk and investment proposals are of same character .(Van Horne).
2. **Designing Debt-Equity mix of the Company-** Cost of capital serves as one of the basis for designing sound capital structure of the company. Capital structure decisions include deciding the proportion of debt and equity in the capital structure which can maximize the value of firm and can minimize the overall cost of capital. The proportion of debt in the capital structure is significantly influenced by overall cost of capital as interest payable on debt is tax deductible. This interest tax shield reduces overall cost of capital and hence increases earning per share of the company. The company can choose the most economical sources of finance after comparing cost of various sources of financing with the expected returns. Accordingly, this will help in devising sound capital structure for a company.

3. **Evaluating Financial Performance of the Company**-The cost of capital serves as one of the standard or benchmark for evaluating financial performance of the concern. Such assessment involves comparison of actual profitability of the concern with the overall cost of capital. Company should yield higher returns than the company's cost of capital. Further, on the basis of this assessment company takes decision regarding dividend distribution and working capital management.

For calculating overall cost of capital, first you need to learn computation of cost of specific source of finance and then weighted average cost of capital. The procedure for calculating Individual Cost of Capital is discussed in the following sections;

# 7.4 COST OF DEBT

The Company can raise Debt in various ways say by raising funds from debentures, bonds, borrowing funds from banks and financial institutions, etc. Now, this debt can be issued at par, at premium and at a discount. Generally, amount paid as interest on debentures are generally fixed and after payment of such interest the remaining amount is distributed among equity shareholders. Hence with the advantage of using fixed charges in the capital structure, earnings available for equity shareholders can be magnified due tax shield.

Note- Dividends payable to equity and preference share holders is an appropriation of Profit and interest payable on debentures, loans etc is the charge against profit and hence is considered as an expense.

## 7.4.1 COST OF IRREDEEMABLE DEBT/PERPETUAL DEBT

The cost of debt is equal to the interest rate if the debenture is given at the same rate and without tax being taken into account. It provides long term funds to the company or in other words it is permanent source of raising funds. The interest rate on debt is assessed a representation of cost of debt in approximate terms. The debentures can be issued at par/face value or at discount or at premium.

**Debt issued at Par**

Debt issued at par is assessed as the explicit interest rate from which tax liability of a firm is deducted. Since interests paid on debentures, loans etc. are treated as expenses hence it is deducted from Earning before Interest and Taxes. Therefore, to calculate cost of debt, tax is deducted from the 'Cost of Debt before Taxes' to arrive the final figure. The following formula is used to compute the Cost of Debt before taxes;

$$k_{d_{Before\ Taxes}} = \frac{Interest}{Principal\ or\ face\ value}$$

To find out Cost of Debt after taxes (1-T) is deducted from the $k_d(Before\ Taxes)$.

$k_{d_{After\ Taxes}}$= $k_{d_{Before\ Taxes}}$(1-T)

T being Tax Rate

**Debt issued at Discount or Premium**

When Debentures are issued at Discount or Premium then in such case you have to calculate Net proceeds realized after issuing debentures for calculating cost of debt. Further if some brokerage, commissions legal fees, accounting fees or some other flotation expenses or cost of underwriting the debenture incurred while issuing debt then the same shall be deducted from principal to find out actual Net proceeds of issue of debentures or bonds.

$k_{d_{Before\ Taxes}}$=$\frac{Interest}{NP}$

NP Net proceeds of issue of debentures, bonds, term loans etc.

Illustration 1 Samridhi Limited has issued 10,000 10% irredeemable debentures of Rs. 100 each. The company is in 30% tax bracket. Calculate cost of debt capital at par, at 5% discount and at 10% premium.

a) At Par

$k_{d_{Before\ Taxes}}$=$\frac{Interest}{Net\ Proceeds} \times 100$

=$\frac{10}{100} \times 100$

=10%

$k_{d_{After\ Taxes}}$= $k_{d_{Before\ Taxes}}$(1-t)

$k_{d_{After\ Taxes}}$= 10(1-.30)=7%

b) At Discount

=$\frac{10}{95} \times 100$

=10.52%

$k_{d_{After\ Taxes}}$= 10.52(1-.30)=7.36%

c) At Premium

$=\frac{10}{110} \times 100$=9.09%

$k_{d_{After\ Taxes}}$= 9.09(1-.30)=6.36%

Let us take one more example for computing Cost of Capital for Irredeemable Debt;

Illustration 2 Sunshine Ltd. issues Rs 10,00,000 10% Debentures of Rs 100 each at a premium of 5%. Issue expenses include Re1 for underwriting commission 0.50 paise brokerage and Rs 1.50 other expenses. Rate of tax is 30%. Calculate Cost of Debt.

Net proceeds=105-(1+.5+1.5)=Rs 102

$k_{d_{Before\ Taxes}}=\frac{Interest}{Net\ Proceeds} \times 100$

$k_{d_{Before\ Taxes}}=\frac{10}{102} \times 100$=9.80%

$k_{d_{After\ Taxes}}$= 9.80(1-.30)=6.86%

## 7.4.2 COST OF REDEEMABLE DEBT

When the debentures or bonds or term loans are redeemable after a definite time period then the cost of debt shall be computed differently. These debenture or bonds are repayable after a definite period. Such debentures have legal binding or obligation to redeem the amount to the debenture holders either at some predefined time period during the lifetime of the debt or as a lump sum at the end of its maturity. In other words, cost of debt is the discount rate which equates the net realization from the issue of debentures to the interest and principal repayments.

$P=\sum_{t=1}^{n} \frac{I(1-t)}{(1+k_d)^t} + \frac{R}{(1+k_d)^n}$

Where;

P= Net Amount realized from debentures

$K_d$=After tax cost of debt

T = Tax rate

R= Redemption Price per Debenture

n= Maturity Period or Number of years in which debt is to be redeemed

Further, when the difference amount between the redemption price and Net Amount realized from debentures can be written off across the life span of the debentures then the following formula shall be used for computation as written off amount is tax deductible;

$$k_{d_{After\ Taxes}} = \frac{I\ (1-t) + \frac{1}{n}(R-P)(1-t)}{\left(\frac{R+P}{2}\right)}$$

In nutshell. Cost of Debt can be calculated as;

$$k_{d_{Before\ Taxes}} = \frac{I + \frac{1}{n}(MV-NP)}{\left(\frac{MV+NP}{2}\right)}$$

$$k_{d_{After\ Taxes}} = \frac{I + \frac{1}{n}(MV-NP)}{\left(\frac{MV+NP}{2}\right)} \times (1-t)$$

Where;

I= Interest

n= Number of years in which debt is to be redeemed or to maturity

MV=Proceeds at par or redeemable value of debt at the time of maturity or Maturity Value

NP= Net Proceeds or selling value minus discount and flotation expenses

T= Tax rate

Let take few examples of computing Cost of Capital for Redeemable Debt;

Illustration 3 A company issued 10,000( 10 years) 10% debentures of Rs 100 each at a discount of 4%. Cost of issue is 2% and tax rate is 30%. Calculate cost of debenture.

Interest= Annual interest $+\frac{\text{Discount and Expenses}}{\text{Period of Issue}}$

$10 + \frac{4+2}{10}$=Rs. 10.60

Net proceeds=Par value-$\left(\frac{\text{Discount+Expenses}}{2}\right)$

=100-$\frac{4+2}{2}$=Rs. 97

$k_{d_{Before\ Taxes}}$=$\frac{Interest}{Net\ Proceeds} \times 100$

$$= \frac{10.60}{97} \times 100$$

$$= 10.92\%$$

$K_{d\ After\ taxes}$= 10.92(1-.30)=7.64%

or

I=10%

MV=100

Net Proceeds= Par value-(discount+ expenses)=100-(4+2)=94

Kd = $\frac{I+\frac{1}{n}(P-NP)}{\left(\frac{P+NP}{2}\right)}$ or $\frac{I+\frac{1}{n}(MV-NP)}{\left(\frac{MV+NP}{2}\right)}$

$$= \frac{10 + \frac{1}{10}(100 - 94)}{\left(\frac{100 + 94}{2}\right)}$$

=$\frac{10+\frac{6}{10}}{\left(\frac{100+94}{2}\right)}$ =$\frac{10.60}{97}$=10.92%

$K_{d\ After\ taxes}$= 10.92(1-.30)=7.64%

Illustration 4 ABC Limited issued 10% Debentures of the face value of Rs 500 at par and floatation cost is 4% and will be redeemed after 10 years at a premium of 5%. Tax rate is 30%. Calculate Cost of Debentures.

Interest=Rs 50

MV= 500+25=525

NP=500-20=480

N=10

$K_{d(\text{Before Taxes})} = \frac{I+\frac{1}{n}(P-NP)}{\left(\frac{P+NP}{2}\right)}$ or $\frac{I+\frac{1}{n}(MV-NP)}{\left(\frac{MV+NP}{2}\right)}$

$=\frac{50+\frac{1}{10}(525-480)}{\left(\frac{525+480}{2}\right)}$

$=\frac{50+4.5}{502.5} \times 100$

$=\frac{54.5}{502.5} \times 100 = 10.84\%$

$K_{d(\text{After Taxes})} = 10.84(1-.30) = 7.59\%$

***Check Your Progress- A***

**Q1. What do you mean by Cost of Capital?**

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**Q2. What are the components of cost of capital?**

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**Q3. How can you determine Cost of Debentures?**

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# 7.5 COST OF EQUITY

Assessing the rate of return expected by shareholder is difficult as the dividends received by equity shareholders are not specified in some legal contract. The main objective of a company is maximizing shareholder's wealth. Therefore management makes all efforts to strengthen position of equity shareholders and this effort requires stream of decisions in respect to capital expenditures and financing pattern.

The cost of equity shall be defined as "the minimum rate of return that a company must earn on the equity-financed portion of an investment project in order to leave the market price of the firm's common stock unchanged." (Van Horne and Wachowicz)

Cost of equity is the rate of return that company pays to the equity shareholders for funds supplied by them. This payment is made in lieu of their expectation for dividends and capital gains and also for the returns which they could have received by investing the funds somewhere else. Company estimates cost of equity also to assess the relative value of investments both for internal projects and opportunities for external acquisitions or proposals. The market value of shares is primarily dependent upon the demand and supply forces prevailing in the capital market. Therefore, the cost of equity is the required rate of return to the shareholder which equates the present value of the expected dividends and the future market value of the sales. There are various methods of calculation of equity share capital these are dividend yield method, divided growth method, price earning and capital asset pricing approach. Let us study these methods in detail;

## 7.5.1 DIVIDEND YIELD METHOD

According to this approach, the cost of equity is determined on the basis of the Dividend per share divided by current market price of equity share or the Net proceeds from the sale of the Shares. This method assumes that the cost of equity is the discount rate that equates the present value of the future dividend per share with the market price of the share. Hence, it is also termed as Dividend Price Ratio method or D/P Ratio Method.

$$Ke=\frac{DPS}{MP} \times 100$$

Where;

DPS=Dividend per share or Expected Dividend per Share

MP=Market price per share

Illustration 5 Horizon Limited issued 10,000 equity shares of Rs 100 each fully paid. The present market price of these shares is Rs 150 per share. The company has paid Rs 15 per share as dividend. Find the Cost of Equity capital.

$Ke=\frac{DPS}{MP} \times 100$

$=\frac{15}{150} \times 100$

=10%

However, this approach suffers from the following limitations;

1. It does not take future earnings into consideration.
2. It assumes that future equity dividend to be constant and does not allow for any growth rate.
3. This does not consider the fact that the shareholders receive growth in dividends as well as capital gain whenever the shares are sold.
4. This excludes proceeds from retained earnings and ignores the fact that the rise in share prices can be attributed to retained profits, rather than high dividends.

## 7.5.2 DIVIDEND GROWTH METHOD

According to this approach, the cost of equity is determined on the basis of the Dividend per share plus the rate of growth in dividend. This means that it assumes that the growth rate in dividend is equivalent to growth rate in earning per share. This model is supported by Shapiro, Gordon and Solomon. It recognizes that future growth in dividend is accounted to the current dividend yield. It further recognizes that the returns on the securities shall be appropriately calculated when the future earnings-price ratio is the same as the current price earnings ratio. However, it is practically difficult to assume that growth in dividends shall be equivalent to the growth rate in earnings per share. Further, quantification of growth in dividend per share is again a subject to the critics as these may varies as per profitability of the concern or as per the circumstances prevailing in the economy and even influenced by other factors influencing the growth. Therefore, theoretically, it can support in determining the expectation of the investors however, practically it is difficult to predict the growth in the uncertain and imperfect market conditions.

$Ke=\frac{DPS}{MP}+g$

Or

$Ke=\frac{DPS}{MP} \times 100+g$

Where;

DPS=Dividend per Share or Expected Dividend per Share

MP=Market price per share

g = growth rate

However, this approach is criticized because of the following reasons;

a) It is practically difficult to predict about future growth pattern as these are uneven and may vary.

b) Only past data can be used to predict for future growth.

c) The dividend growth is dependent upon retained earnings of the company and predicting growth on the basis of the retained earnings is also a strenuous task.

Illustration 6 The average rate of dividend paid on equity share capital for the last five years is estimated by the Finance Manager of ABC Limited as 10%. The growth rate in dividend has been 4% per annum. The market price of equity shares is Rs 150 per share. The Face Value of the equity share is Rs 100. Find the Cost of Equity Capital.

$Ke=\frac{DPS}{MP}+g$

$=\frac{10}{150} \times 100+4$

=10.67%

Illustration 7 Shares of ABC Limited is quoted at Rs 10 on the Bombay Stock Exchange; the current price per share is Rs 25. The gross dividends over the last four years have been Rs 2.25, Rs 2.7, Rs 3.24 and 3.88. You have to calculate cost of equity share.

From the trend of gross dividends it is deduced that dividend are growing @ 20%

Expected current year dividend $=1.45\times \frac{120}{100}$ = Rs. 4.66

$Ke=\frac{4.66}{25}+.20$

.1864+.20=.3864 or 38.64%

## 7.5.3 PRICE EARNING METHOD

According to this method, the cost of equity can be calculated on the basis of Earning per share and market price of the share. It is based on the assumption that the investors capitalize the stream of future earnings of the share and the earning of a share that are not distributed to the shareholders. That means it takes into account both dividends as well as retained earnings for the computation of cost of equity. This method assumes that even if earnings are not

distributed to the shareholders as dividends, it is retained by the company as surplus which later magnifies the growth of earnings of the company as well as market price of the share. This is also called as Earning/Price Ratio Method or E/P ratio Method. The other option is to calculate on the average rate of earning and the average market price of equity shares.

$$\text{Ke}=\frac{Earning\ per\ share}{Market\ price\ per\ share}\times 100$$

Illustration 8 The issued capital of Sunshine Limited is 40000 equity shares of Rs 10 each, fully paid. Its annual income after interest and taxes is Rs 2,00,000. The market price of the company's share is Rs 30. Calculate the Cost of Equity.

Earnings per Share(EPS) $=\frac{EAT}{No\ of\ Shares}$

$=\frac{200000}{40000}$

=Rs 5

Ke$=\frac{5}{30}\times 100$=16.67%

However,

Assumptions of this approach are as mentioned as under;

1. Constant earnings per share is assumed for future.

2. There should be either 100 per cent retention ratio or 100 per cent dividend payout ratio

3. The company's source of finance is through equity shares and debt is not employed by the company.

## 7.5.4 CAPITAL ASSET PRICING MODEL

The CAPM divides the cost of equity into two parts, one being risk free rate of return and the other additional risk premium for investing in a particular or investment. Risk free rate of return is the return gained by investing into government securities and the risk premium is the product of the premium required on an average-risk investment also called as the "market risk premium" and the relative risk of the security termed as beta.

The Capital Asset Pricing Model (CAPM) is a model of equilibrium that calculates the relationship between risk and expected return of an asset based on the sensitivity of the asset to general stock market movements. CAPM is a model "that describes the relationship between risk and expected(required)return; in this model, a security's expected (required)

return is the risk free rate plus a premium based on the systematic risk of the security". (Van Horne and Wachowicz, pp 106, 13th Edition)

According to this method, the cost of equity is calculated by the following equation;

$K_e=R_f+\beta_i(R_m - R_f)$

Where;

$R_f$=Risk free rate of return

$\beta_i$=Beta of the Investment

$R_m$=Rate of Return on market portfolio

Illustration 8 Sundram Ltd expects a return of 10% on the stock. The Stock's beta is 1.60. The risk free rate of interest on government securities is 4%. Calculate cost of equity on the basis of Capital Asset Pricing Model.

$K_e=R_f+\beta_i(R_m - R_f)$

=4%+1.60(10%-4%)

=4%+1.60(6%)

=13.6%

## 7.6 COST OF PREFERENCE SHARES

Apparently, the cost of the preferred share capital is the dividend paid and accrued by the company. The preference share shall be given at the fixed rate of the dividend on the face value of the shares. Generally, dividends are paid on a fixed rate but it is not the legal biding on the management to pay dividends. But it is generally paid when company makes adequate profits. Therefore, it is sometimes inferred that since it is not legal binding on the company to pay dividend on preference shares hence, it does not have a cost. But, nonpayment of preference dividends adversely affects the company's reputation as well as it is critical to the basic existence of equity shareholders. Since, nonpayment of dividends will result into equal voting rights by preference shareholders and as a result equity shareholders will lose the control over the company. Further, it will also impact the raising of funds by the company. Therefore, preference shares also have a cost.

The par value of the preference shares capital shall be adjusted to assess Net proceeds when these shares are issued at premium or discount. Further, if there are certain issue expenses then these have to be deducted to find Net Proceeds.

## 7.6.1 COST OF IRREDEEMABLE PREFERENCE SHARES

Dividend paid on preference shares divided by Net Proceeds is the cost of irredeemable Preference shares. Preference Shares that are not payable until the liquidation of the corporation is known as an irredeemable preference share.

$$K_{p}=\frac{D_p}{NP}$$

Where $K_p$= Cost of irredeemable preference shares

$D_p$= Preference Shares Dividend

$NP =$ Net proceeds received from issue of preference shares after meeting the issue expenses.

The above formula is computed on after tax basis therefore to calculate $K_p$ before tax, Cost of preference shares after tax is divided by (1-t). However, for decision making and for further computational purposes, cost of preference shares is considered only on after tax purposes.

Illustration 9 ABC limited issued 5,000 10% Preference Shares of 100 each. Cost of issue is Rs5 per share. Calculate Cost of Preference Share Capital (before tax as well as after tax) if shares are issued ;

a) at par
b) at 6% premium
c) at 4% discount.

Tax rate prevailing is 30%

a) $K_{p(after\ tax)}=\frac{D_p}{NP}$

$=\frac{10}{95}\times 100 = 10.52\%$

$K_{p(before\ tax)}=\frac{D_p}{NP}$

$=\frac{10.52}{(1-.30)}=15.02\%$

b) $K_{p(after\ tax)}=\frac{D_p}{NP}$

$=\frac{10}{106-5}\times 100 = 9.90\%$

$K_{p(before\ tax)}=\frac{D_p}{NP}$

$=\frac{9.90}{(1-.30)}=14.14\%$

c) $K_{p(after\ tax)}=\frac{D_p}{NP}$

$=\frac{10}{96-5}\times 100 = 10.98\%$

$K_{p(before\ tax)}=\frac{D_p}{NP}$

$=\frac{10.98}{(1-.30)}$=15.68%

Illustration 10 XYZ limited issues 5,000 6% Preference Shares of Rs 100 each at par and the Company incurs the following expenses;

Underwriting commission is 2%, brokerage is 2% and other expenses are 500.

Calculate Cost of Preference Share Capital.

a) $K_{p(after\ tax)}=\frac{D_p}{NP}$

Net Proceeds=100-2-2-$\frac{500}{5000}$=96-.1=95.9

$=\frac{6}{95.9}\times 100 = 6.25\%$

$K_{p(before\ tax)}=\frac{D_p}{NP}$

$=\frac{6.25}{(1-.30)}$=8.93%

## 7.6.2 COST OF REDEEMABLE PREFERENCE SHARES

Whenever preference shares are issued with a specified maturity date then the cost of capital is assessed as the discount rate that equates the sale value of preference shares after deduction of discount and floatation expenses with the present value of dividends and principal repayment that will be made at a future date. Accordingly, the cost of preference shares in such case shall be calculated as under;

$$Kp=\frac{D_p+\left(\frac{MV-NP}{N}\right)}{\left(\frac{MV+NP}{2}\right)}$$

Where,

$K_p$= Cost of Irredeemable Preference Shares.

D= Constant Annual Preference Dividend Payment

N= Number of years to redemption

MV=Maturity value of Preference Shares

NP=Net Proceeds

Dividend on preference shares is taken as an appropriation of profits and it not a charge against profits; therefore it considered that the cost is considered on after-tax basis.

Illustration 11 ABC Limited issues 60,000 12 % preference share of Rs 100 each at 2% discount. These preference shares are to be redeemed after 10 years at 10% premium. The flotation cost is 6 per share and tax rate is 30%. Find out the cost of preference share capital.

$$Kp=\frac{D_p+\left(\frac{MV-NP}{N}\right)}{\left(\frac{MV+NP}{2}\right)}$$

Net Proceeds=98-6=92
MV==110
PD=12%

$$Kp=\frac{D_p+\left(\frac{MV-NP}{N}\right)}{\left(\frac{MV+NP}{2}\right)}$$

$$=\frac{12+\frac{110-92}{10}}{\frac{110+92}{2}}$$

$$=\frac{12+1.8}{101}=13.66\%$$

*Note:*

*Always remember that cost of preference shares is paid out of the profit after tax therefore cost of preference share capital does not require any tax adjustment. Further, interest on debt is tax deductible and interest on preference dividend is not tax deductible. Hence, there is no tax shield provided by Preference Shares. Therefore generally after tax cost of preference shares is considerably on the higher side than the after tax cost of debt.*

## 7.7 COST OF RETAINED EARNING

Retained Earnings is the internal source of financing and therefore it is generally thought that Retained earning does not constitute cost. But this is not the case. Even Retained Earning does have cost. The cost of the retained earnings is basically opportunity cost of the implied expense to the shareholder who is not given opportunity to invest the retained earnings in alternative source of financing. These are the funds accumulated by the company for various years that are kept out from the funds available for distribution. Accordingly, this fund can be

used for diversification, expansion, project financing and the likes. Funds raised by any sort of financing have implied capital costs as soon as they are invested. Therefore, the retained earnings are basically the distributable profits available for equity shareholders. If these are appropriated then this amount could have been reinvested by equity shareholders. Thus, the cost of retained earnings is the rate of return which the existing shareholders can avail if they invest after tax dividends in various other alternatives available. Accordingly, the cost of retained earnings is the opportunity cost of dividends foregone by shareholders.

If this retained earnings are distributed to the equity shareholders then it will attract personal taxation. From this point of view cost of retained earning can be calculated using the given formula;

$K_r$= Dividend rate (1-t)

Where;

$K_r$ = Cost of Retained Earning

D= Dividend Rate

T= Tax Rate for individuals

If shareholders incur some brokerage cost for investing the dividends received then such amount shall be deducted from the funds available for reinvestment.

The alternative method for the computation of cost of retained earning taking into account that if an offer is made to the shareholders for subscribing to right shares instead of dividends from the retained profits is distributed, then the shareholders will willingly subscribe to right shares in expectation of assured returns. It can also be stated in this way that if the retained profits are distributed in the form of dividends to the shareholders and later the amount is call back by offering the right shares then the dividends paid shall be levied with personal taxation and the shareholder can invest in right shares only to the amount of the net dividends so received from the company. According to this right offer approach, if the retained earnings are not distributed then the price of shares will increase to the extent of retained profits which will be taxed as per the capital gains for the individual shareholder. In such case, the following formula shall be used for computing cost of retained earnings;

$$K_{re} = \frac{D(1-T_i)}{P(1-T_c)}$$

Where;

$K_r$ = Cost of Retained Earning

D= Dividend Rate

$T_i$ = Marginal tax rate on income of individual shareholder.

$T_c$=Capital gains tax

P = market price per share

Let us learn its computation using the above formula;

Illustration 12 ABC Ltd. has paid an equity dividend of Rs 2 per share. It is further provided to you that market price of its equity shares is Rs 30. The marginal tax rate is 30% and capital gain tax being 20%. Let us now compute cost of retained earnings;

$$K_{re} = \frac{2(1-.30)}{30(1-.20)}$$

$$= \frac{1.4}{24} = 0.05833 \text{ or } 5.83\%$$

The following method is also used for computing cost of retained earnings;

$$K_{re} = \frac{AD(1-T_d)}{RE(1-T_c)}$$

Where;

$K_{re}$ = Cost of Retained Earning

AD= Alternate Dividend Income

$T_d$ = Tax rate on dividend income

$T_c$=Capital gains tax

RE= Retained Earning

Let us calculate cost of retained earning using the above formula;

Illustration 13 Saumya holds 5000 equity shares of ABC Limited of Rs 100. ABC Limited returns were Rs 20 per share and the company distributed Rs 15 per share as dividend and remaining amount was retained by the company. The market price of equity share is Rs 120 per share. Personal tax rate of Saumya is 30%. Calculate Cost of Retained Earning.

Retained Earnings of Saumya =$5000 \times 5 = 25{,}000$

Alternative investment can be made by Saumya for the amount of Retained Earnings=$\frac{25{,}000}{120}$=208.33

Alternative Dividend Income=$208 \times 20 = 4160$

$=\frac{AD(1-T_d)}{RE(1-T_c)}=\frac{4160(1-.30)}{25000}$=11.64%

Note: It is assumed that the above hypothetical example does not attract capital gain tax.

Cost of retained earning can also be calculated after adjusting tax and cost of purchasing new securities. As shareholders have to pay taxes on dividend received. Further if the amount is reinvested in other alternatives then the brokerage cost shall be levied for making investments. Accordingly, the cost of retained earnings shall also be computed as per the formula given;

$K_r=\left(\frac{E}{NP}+g\right)\times(1-t)\times(1-b)$

$=k_e\times(1-t)\times(1-b)$

Where

$k_e=$ Cost of Equity Capital

T=tax rate

b=Brokerage cost

However, the cost of retained earnings is generally less than the cost of equity shares.

Illustration 14 For example, A company's cost of equity capital is 15% and tax rate of majority of shareholders is 30%. The company pays brokerage of 2%, then the cost of retained earnings in this case shall be;

= 15% ( 1 – 30% ) ( 1 – 2% )

= 15 ×.70 ×0.98

= 10.29%

Note-The Book value weights of specific cost of capital are taken in face value or in other words you can say the structure of capital as given in the balance sheet.

## 7.8 WEIGHTED AVERAGE COST OF CAPITAL

Cost of equity, Cost of Debt, Cost of Preference Shares and Cost of Retained Earning individually plays a vital role while analyzing the impact an individual cost of capital on the firm. However, you also need to calculate weighted average cost of capital and marginal cost of capital for various financial decisions. Simple average cost of capital will not give any meaning unless assessed in totality. Therefore, weighted average cost of capital is the rate that a firm on an average pays to all its securities holders to finance its financial structure.

The weighted average cost of capital serve as a benchmark or a parameter in appraising profitability of the company or a firm.

The relative proportion of different sources of financing are assign weights. These weights can be taken either as per book value or as per capital structure weights or as per market value. Weights that are based on book value are placed on the basis of balance sheet values. The weights are calculated as per the source of the fund's book value divided by the total fund's book value. Weights on the basis of capital structure are calculated as per the basis of desired capital structure. The weights are placed to the component of capital structure to find out cost of capital. Under market value approach, you have to assign the weights to cost of equity, cost of preference shares, cost of debt and cost of retained earnings on the basis of market value of the capital component divided by the market value of all capital and capital components opted by the company for financing.

Therefore, weights are assigned to the individual cost of capital depending upon its proportion in the capital structure. The weighted average cost of capital can be calculated before tax or after tax basis. But the most appropriate is to calculate weighted average cost of capital on after tax basis.

Therefore the formula for calculating weighted average cost of capital is

$K_o = K_d(1\text{-}t)\times wg + K_e \times wg + K_{ps} \times wg + K_{re} \times wg$

$K_o$ = Overall Cost of Capital

$K_d$ = Cost of Debt

$K_{ps}$ = Cost of Preference Shares

$K_e$ = Cost of Equity

$K_{re}$ = Cost of Retained Earning

Wg= Weight in the capital structure

It can also be written as $K_o = \frac{\sum WX}{\sum w}$

Where x cost of specific source of financing example equity, debt, retained earning etc. and

W is weighted proportion of specific source of capital

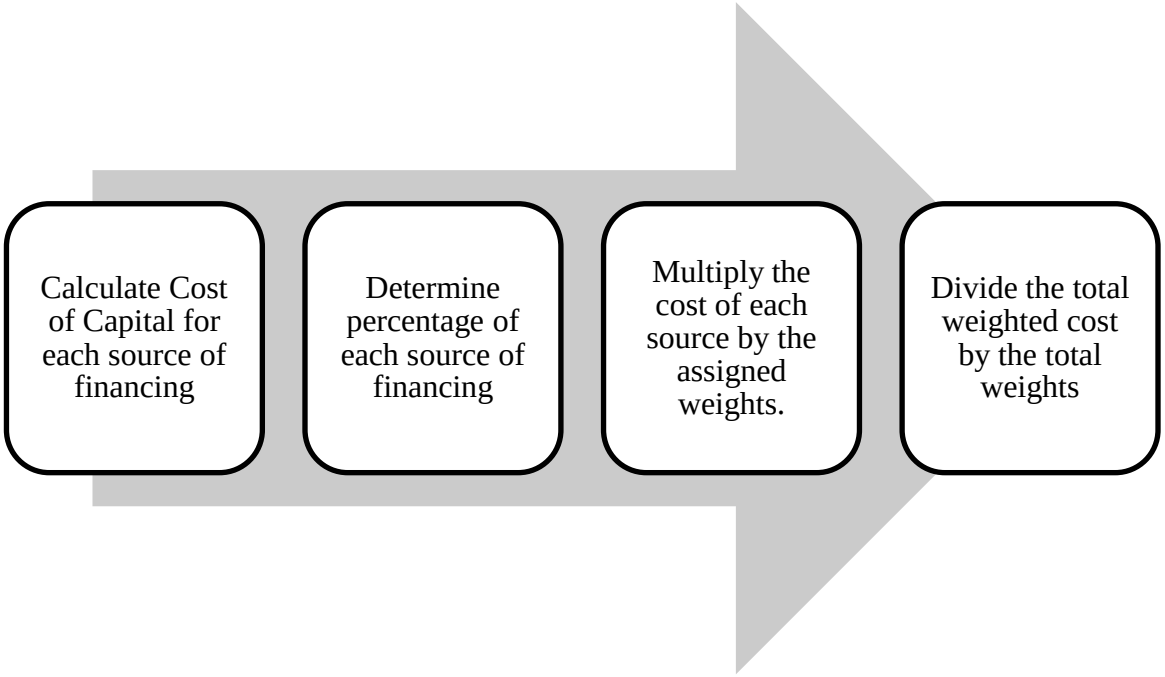


**Fig 7.1Step by Step process of computing weighted average cost of capital.**

Illustration 15 The following information is provided by Excel Limited to you. The company requires your consultancy services for planning its capital structure for future. Accordingly, you are expected to calculate the weighted average cost of capital for Excel Limited. Now, let us start calculating the overall cost of capital on the basis of information so provided.

| **Sources of Funds** | **Book Value** | **Market Value** | **Cost of Capital After Tax** |
|---|---|---|---|
| Debentures | 1000000 | 800000 | 12 |
| Preference Shares | 3000000 | 3500000 | 15 |
| Equity Shares | 4000000 | 3500000 | 18 |
| | 8000000 | 7800000 | |

Let us now calculate overall cost of capital using Book Value and Market Value;

| **Sources of Funds** | **Book Value** | **Weights in Capital Structure** | **Cost of Capital After Tax** | **Weighted Cost** |
|---|---|---|---|---|
| Debentures | 1000000 | 0.125 | 12 | 1.50 |
| Preference Shares | 3000000 | 0.375 | 15 | 5.63 |

| | | | | |
|---|---|---|---|---|
| Equity Shares | 4000000 | 0.5 | 18 | 9.00 |
| | 8000000 | 1 | | 16.13 |

The weighted cost is computed after multiplying weights in capital structure with after tax cost of capital. The weighted average cost of capital of Excel Limited on the basis of Book Value is computed as under;

$K_o = \frac{\sum WX}{\sum w} = \frac{16.13}{1} = 16.13$

| **Sources of Funds** | **Market Value** | **Weights in Capital Structure** | **Cost of Capital After Tax** | **Weighted Cost** |
|---|---|---|---|---|
| Debentures | 800000 | 0.1025 | 12 | 1.23 |
| Preference Shares | 3500000 | 0.448 | 15 | 6.72 |
| Equity Shares | 3500000 | 0.448 | 18 | 8.06 |
| | 7800000 | 1 | | 16.01 |

The weighted average cost of capital of Excel Limited on the basis of Market Value is computed as under;

$K_o = \frac{\sum WX}{\sum w} = \frac{16.01}{1} = 16.01\%$

Illustration 16 Let us take another example, the Surmount Limited submit the following capital structure to you;

6% Preference Shares 4,00,000

Equity Shares of Rs 20 each 5,00,000

8% Debentures 7,00,000

Retained Earnings 6,00,000

The market price of equity shares is Rs 30. The company expects to distribute dividend of Rs 6 per share. The individual tax rate applicable for shareholders is 20% and corporate tax rate is 30%. Company expects you to find its weighted average cost of capital.

For the above example you have to first find specific cost of capital for each component for capital structure.

**Cost of Preference Share Capital**

$K_{p\ (after\ tax)} = \frac{Preference\ Dividend}{Net\ proceeds} \times 100$

$= \frac{6}{100} \times 100$

$= 6\%$

**Cost of Debentures**

$K_{d\ (Before\ tax)} = \frac{Interest}{Net\ proceeds} \times 100$

$\frac{9}{100} \times 100 = 9\%$

$K_{d\ (after\ tax)} = 9\% \times (1 - .30) = 6.3\%$

**Cost of Equity Shares**

$K_{e\ (after\ tax)} = \frac{DPS}{Market\ Price} \times 100$

$\frac{6}{30} \times 100 = 20\%$

**Cost of Retained Earning**

$K_{re\ (after\ tax)} = \frac{AD(1-T_d)}{RE} \times 100$

Alternative Investment $= \frac{600000}{30}$

$= 20000$ Shares

Alternative Dividend $= 20000 \times 6 =$ Rs 120000

Retained Earnings=Rs 6, 00,000

$K_{re\ (after\ tax)} = \frac{AD(1-T_d)}{RE} \times 100$

$= \frac{120000(1-.20)}{600000} \times 100 = 16\%$

| Sources of Funds | Book Value | Weights in Capital Structure | Cost of Capital After Tax | Weighted Cost |
|---|---|---|---|---|
| Debentures | 700000 | 0.32 | 6.30 | 2.01 |
| Preference Shares | 400000 | 0.18 | 6.00 | 1.08 |
| Equity Shares | 500000 | 0.23 | 20.00 | 4.6 |
| Retained Earnings | 600000 | 0.27 | 16.00 | 4.32 |
| | 22,00,000 | 1 | | 12.01 |

The weighted average cost of capital of Surmount Limited is computed as under;

$K_o = \frac{\sum WX}{\sum w} = \frac{12.01}{1} = 12\%$

***Check Your Progress- B***

**Q1. How do you ascertain Cost of Equity Shares?**

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**Q2. Write the formula of calculating cost of retained earning?**

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**Q3. What do you mean by weighted average cost of capital?**

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## 7.9 MARGINAL COST OF CAPITAL

The weighted average cost of new or incremental capital is termed as marginal cost of capital. It is calculated for new or incremental capital instead of sources of funds raised previously by the company. Here, weights are assigned in proportion to funds a company wanted to raise. Hence, it is used for additional funds a company intends to employ and accordingly marginal weights are employed to calculate marginal cost of capital. It shall be equal to weighted average cost of capital when company utilizes the existing proportion of finances and partial cost of component of capital structure. However, it shall be different than the weighted average cost of capital due to the change in magnitude and cost of various sources of funds used to raise additional funds. But it is also true that, in general, weighted average cost of capital is more close in achieving the basic objective of financial management i.e. maximization of shareholders wealth.

## 7.10 SUMMARY

In this unit you learnt that cost of capital is useful in planning optimal capital structure, expenditure appraisal, and measurement of financial results.The cost of capital is the minimum rate of return that is expected by the company to earn to meet the expectations of the equity shareholders or various categories of investors. Therefore, there are broadly two elements of cost of capital these are, a risk-free rate of interest and a risk premium, which is the compensation an investor would receive for a perceived risk level. Business risk refers to the changes in EBIT due to changes in sale revenues whereas financial risk refers to the risk associated with the capital structure of financial plan of a business. The various sources of finance that company uses for raising funds are equity shares, debentures, term loans, bonds, retained earnings etc.In this unit you also learnt that marginal cost of capital is different than the weighted average cost of capital due to the change in magnitude and cost of various sources of funds used to raise additional funds.

## 7.11 GLOSSARY

**Cost of capital**-It is the minimum rate of return that a firm should get so that it can maintain its market value of the shares and thereafter be able to maintain value of a firm.

**Cost of equity**-It is the rate of return that company pays to the equity shareholders for funds supplied by equity shareholders. It is the minimum rate of return that a company must earn on the equity-financed portion of an investment project in order to leave the market price of the firm's common stock unchanged.

**Irredeemable Preference Shares**-Preference Shares that are not payable until the liquidation of the corporation is known as an irredeemable preference share.

**Marginal Cost of Capital**-The weighted average cost of new or incremental capital is termed as marginal cost of capital. It is calculated for new or incremental capital instead of sources of funds raised previously by the company.

## 7.12 REFERENCES


- Kishore Ravi M.(2009), "Chapter 8 Cost of Capital" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 221-239
- Khan, M.Y. and Jain, P.K.,( 2006), " Chapter 15 Capital Structure, Cost of Capital and Valuation" in Financial Management Text and Problems., Second Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, pp 15.1-15.31
- Sristava Rajiv and Mishra Anil (2016), "Chapter 13 Cost of Capital" in Financial Management, Oxford University Press, New Delhi, pp 340-364
- Pandey, I.M. (2010), "Chapter 9 The Cost of Capital" in Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi, pp 167-194
- Rustagi R.P. (2011), "Chapter 13 Leverage, Cost of Capital and Value of the Firm" Financial Management- Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd. pp 411-432
- Van Horne, James C. and Wachowicz, John M. Jr (2009), "Chapter 15 Required Returns and the Cost of Capital" in Fundamentals of Financial Management, 13th edition, Pearson Education Limited, pp 381-417

- Rubeh J. Bohanwala(2006), "Chapter 3 The Individual Cost of Capital and Chapter 4 The overall cost of capital", in Financial Management, Second Edition, Taxmann Allied Services (P) Ltd. , pp 49-88
- Kuchhal S.C. (1980), Chapter 21 Cost of Capital" in Financial management: An Analytical and Conceptual Approach, Seventh Edition, pp 419-444
- Rajkumar, J.S. Rana and A.K Mishra(1988), "Chapter 8 Cost of Capital" in Financial Analysis and Planning , Chandra Publications


## 7.13 SUGGESTED READINGS


1."Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.

2."Gopalakrishnan", Project Management, TMH, 2007.

3."H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.

4."Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.

5."Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.

6."Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.

7."Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.

8."Prasanna Chandra", Project Management, TMH,2007.

9."Chowdry", Project Management, TMH,2007.

10. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition

11. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.

12. Financial Management: I.M. Pandey.

13. Financial Management: Theory and Practices- Prasanna Chandra.

14. Financial Management: Khan and Jain.

## 7.14 TERMINAL QUESTIONS

Q1. Discuss the relevance of determining cost of capital of an undertaking.

Q2. What do you mean by cost of capital? Discuss its importance for investors as well for the company.

Q3. What is meant by cost of capital? How do you determine cost of capital for different sources?

Q4.How do you determine the following;

a) Cost of Irredeemable Preference Shares.

b) Cost of Redeemable Debt.

c) Cost of Retained Earnings.

Q5. What is the difference between business risk and financial risk? Explain the method of its computation using a hypothetical example.

Q6. What do you mean by weighted average cost of capital?

**Numerical Questions**

Q7. Sundar limited issues 6,000 5% Debentures of Rs 150 each at a premium of 10%. The cost of the issue is 4%. The rate of tax applicable to the company is 30%. Compute the after tax cost of Debentures.

Q8. Sunshine Ltd. issues 14% Debentures of face value Rs. 100 each and realizes Rs. 80 per Debenture. The Debentures are redeemable after 10 years at a premium of 10%. Calculate Cost of Debentures assuming tax rate of 30%.

Q9. Ms. Jasmin holds 2000 equity shares of ABC Limited of Rs 100. ABC Limited returns were Rs 15 per share and the company distributed Rs 10 per share as dividend and remaining amount was retained by the company. The market price of equity share is Rs 100 per share. Personal tax rate applicable for Ms. Jasmin is 30%. Calculate Cost of Retained Earning.

Q10. A Company intends to issue 2000 8% Preference Shares of Rs 100 each. The other expenses of capital issue are underwriting 2%, brokerage,3% and Printing 500. Calculate cost of capital if issue has been made;

a) at par value

b) on discount of Rs 5 per share

c) on premium of Rs 5 per share.

The following details are available:

Equity Rs. 5, 00,000, It is expected that dividend shall be payable @10%

Tax Rate 30%

6% Preference Rs. 2, 00,000

7% Loan Rs. 3, 00,000

You are required to calculate Weighted Average Cost of Capital.

Q11. Mission Ltd. share with a face value of Rs 10 each are quoted at Rs 60 in the stock market. Current rate of dividend is 30% and this is expected to grow at the rate of 3%. Calculate the cost of equity capital of the company.

Q12. A firm has Earning per Share as Rs. 5 and 10% growth rate of earnings over a period of 3 years. The current market price of equity share is Rs. 100. Compute the cost of equity capital.

Q13. Samruddhi Ltd has its equity shares of Rs 8 each quoted in the stock market has market price of Rs 50. It is expected that annual growth rate of 5% and a dividend of Rs 4 per share has been paid by the company for the current year. Calculate cost of capital.

Q14. From the following information, calculate the cost of equity capital using CAPM approach. Required rate of return on risk free security is 12% and required rate of return on market portfolio of investment is 15%. It is also given that firms beta is 1.6.

Q15. The following details are provided regarding amount and specific cost of each capital;

| Type of Capital | Book Value | Market value | Specific cost of capital |
|---|---|---|---|
| Debentures | 3,50,000 | 4,00,000 | 12% |
| Preference Shares | 2,00,000 | 2,00,000 | 13% |
| Equity Shares | 4,00,000 | 7,70,000 | 15% |
| Retained Earning | 1,50,000 | | 10% |
| | 11,00,000 | | |

You are required to calculate weighted average cost of capital using;

a) Book value Weights

b)Market Vale as weights

Assume tax rate as 30%

# UNIT 8 CAPITAL STRUCTURE



## 8.1 INTRODUCTION

In the previous unit you learnt about the concept of cost of capital and you also gained an understanding of the methods required for the computation of the cost of capital raised through various sources. Now in the present unit, you will learn that it is imperative for an organisation to have an appropriate proper mix of various types of securities so that overall cost of capital is minimized and value of firm is maximised. Keeping this objective in mind, it is imperative for a company to devise a sound capital structure through a combination of debt, equity and hybrid securities that maximising shareholder's wealth.

## 8.2 OBJECTIVES

After reading this unit you will be able to:

- Know the concept of capital structure.
- Differentiate between capital and financial structure.
- Identify various factors affecting capital structure.
- Understand legal factors affecting capital structure.

## 8.3 CONCEPT OF CAPITAL STRUCTURE

The term 'Capital Structure' can be segregated into two words that are Capital and Structure. Structure is taken from the Latin word *structura* which means something that is made up of parts that are arranged in a certain way. Capital refers to the funds raised to support the functioning of business units. Capital Employed can also be represented as total assets minus current liabilities. The funds brought in company in the form of debt and equity are represented as under;

**Equity represents the following;**

a) Equity Share Capital
b) Preference Share Capital
c) Share premium
d) Reserve and Surplus
e) Retained Earning
f) Provisions for Contingency etc.

**Debt comprises of the following;**

a) Debentures
b) Long Term Loans from Banks and other Financial Institutions
c) Long term borrowings
d) All deferred payment liabilities

Accordingly, Capital Structure refers to the proportion of long term sources of funds in the capitalization of the firm. The proportion of equity shares, preference shares, debentures, long term loan, retained earnings etc. constitute the firm's capital structure. Capital Structure generally refers to the mix of debt and equity in the total capital of a company. It actually depicts the proportion of long term finances employed in a firm. The company's capital structure represents its investment and financing strategy. Let us study few of the definitions of capital structure given by financial wizards.

Gerstenberg defines "Capital Structure as the makeup of a firm's capitalization."

Van Horne and Wachowicz "Capital Structure is the mix (or portion) of a firm's permanent long-term financing represented by debt, preferred stock, and common stock equity".

Guthmann and Dougall stated that "capital structure may be used to cover the total combined investment of the bondholders including any long-term debts such as mortgages and long-term loans as well as original investment".

Kishore Ravi, "The term total capital structure denotes mix of owner's funds and outsider's funds or it is proportionate relationship of firms permanent long term financing represented by equity and debt."

Khan and Jain "Capital Structure is the proportion of debt and preference shares on a firm's balance sheet ".

Pandey I.M. "The term capital structure is used to represent the proportionate relationship between debt and equity".

Srivastava and Misra "Capital Structure decision refers to the proportion of debt and equity and finding out whether there is a capital structure that can be said to be optimum for the shareholders of the firm".

Thus, capital structure influences the value of a firm by influencing the Earning Per share as well as by influencing cost of capital. Thus, these decisions affect the earnings available to the owners of the company by influencing Earning Per Share. However, from the last definition it can be assessed that there is another aspect in capital structure which is generally termed as optimum capital structure. The optimum capital structure is basically that proportion of debt and equity that will maximise the value of the firm. In simple words, through right mix of debt and equity, value of a firm or a company can be magnified.

Thus, Optimum Capital Structure is the idealist expression or one can say quite theoretical because in the present competitive and unstable world it is really tough to find any optimum or ideal capital structure. Therefore it is better to refer appropriate capital structure or sound capital structure or relevant or target capital structure as these are more realistic as compared to optimum capital structure. This capital structure is decided by taking into account several factors including financial, personal, psychological and managerial factors. But since optimum capital structure is much discussed among finance professionals therefore, let us identify the features of an optimum capital structure.

**Features of Optimum Capital Structure**

The optimum capital structure has the following features;

a) **Profitability-** The optimum capital structure should augment profitability of the company. The same can be augmented by minimizing cost of capital or weighted average cost of capital. It should basically increase earnings per share.
b) **Flexibility-** The optimum capital structure should be such that whenever required a firm can easily raise the funds from the sources that are prudent at the given point of time. Thus, debt-equity mix should be such that it offers option of reduction or expansion of debt under different conditions or situations.
c) **Solvency**- The optimum capital structure should not affect solvency of the firm. There should be balance between debt and equity in such a way that at the time of adverse conditions, solvency is not threatened due to payments of interest or dividends. A company should not raise funds from too much equity or too much debt.

d) **Liquidity-** The optimum capital should provide liquidity to the firm. This means that capital structure should not have higher level of debt as higher debt may lead to greater outflow of cash. This outflow may create cash crisis of funds, thereby crushing liquidity position of the firm. Hence, capital structure should be devised in a way EBIT is adequate to cover all its debt obligations and fixed charges.
e) **Reduced Risk-** The optimum capital structure should not affect variability of earnings or returns. The risk may arise due to economic, macroeconomic factors, industry and firm centric factors. High debt proportion in the capital structure may affect returns and hence may threaten the solvency of a company. Therefore, high level of debt may lead to increased WACC which may further decrease market price of company's share.
f) **Control-** Optimum Capital Structure should ensure that the control of stakeholders of the company is not diluted. The capital structure should be so crafted that it involves minimum risk of loss of control of the company.

Thus, finance manager can work hard to find appropriate capital structure so that it can magnify value of the firm together with reduced cost of capital and risk to shareholders. Because of tax shield provided by interest payments, the debt employed by the company generally reduces the tax burden. However, debt so raised by the company also increases financial risk. Managers, therefore should plan that level of debt in the company that minimizes overall cost of capital, maximizes the profits available to the equity shareholders and hence increases the value of the company. Therefore, decision regarding capital structure is important for optimizing returns to the shareholders of the company. These increased returns to the stakeholders shall bring advantage over other companies in terms of Value and Cost of Capital. This is therefore hard core fact that the finance manager has to make parity between the ability to control the funds and the developments in the availability of the funds.

## 8.4 DIFFERNCE BETWEEN CAPITAL STRUCTURE AND FINANCIAL STRUCTURE

The following differences are observed between Capital Structure and Financial Structure;

| Sr. no. | Capital Structure | Financial Structure |
|---|---|---|
| 1. | It includes only long term sources. | It includes long term as well as short term sources of funds. |
| 2. | It reflects only long term sources of funds that are reflected in the | It reflects entire liabilities side of Balance Sheet. Thus, it is reflects asset |

| | | |
|---|---|---|
| | liabilities side of the Balance Sheet. | structure of a company. |
| 3. | It includes equity, preference shares, debentures, retained earnings, long term borrowings, etc | It includes equity, preference shares, debentures, other Long Term Liabilities, Loan from Bank. Mortgage, Current Liabilities, Sundry Creditors, Advance from Customers, Outstanding Expenses, Income Received in Advance or Short term borrowing etc. |
| 4. | It denotes long term debt and shareholders fund. | Financial Structure denotes net worth or owners' equity and all liabilities. |
| 5. | It does not include current liabilities. | It includes current liabilities for its calculation. |
| 6. | It basically represents permanent financing of the firm. | It refers to the way in which the assets of the firm are managed and financed. |
| 7. | Capital structure is a part of financial structure. | Financial structure includes capital structure. |

**Let's take the following example to have more conceptual clarity regarding the difference between financial and capital structure;**

| **Balance Sheet of XYZ Limited as on 31st March, 2019** | | |
|---|---|---|
| | | |
| | | |
| **Assets** | | **Amount (In Rs.)** |
| ***Current Assets*** | | |
| | Cash | 15,000 |
| | Accounts Receivables | 15,000 |
| | Inventory | 30,000 |
| | Prepaid Expenses | 5,000 |
| | Short-Term Investments | 5,000 |
| | *Total Current Assets* | 70,000 |
| ***Fixed (Long-Term) Assets*** | | |

| | | |
|---|---|---|
| | Long-term Investments | 20,000 |
| | Property, Plant, and Equipment | 25,000 |
| | Intangible Assets | 10,000 |
| | *Total Fixed Assets* | 55,000 |
| ***Other Assets*** | | |
| | Deferred Income Tax | |
| | Others | |
| | *Total Other Assets* | - |
| | | |
| **Total Assets** | | **1,25,000** |
| | | |
| **Liabilities and Owner's Equity** | | |
| ***Current Liabilities*** | | |
| | Accounts Payable | 8,000 |
| | Short-term loans | 2,000 |
| | Income Taxes payable | 5,000 |
| | Accrued Salaries and Wages | 5,000 |
| | Unearned Revenue | 5,000 |
| | Current portion of long-term debt | 5,000 |
| | *Total Current Liabilities* | 30,000 |
| ***Long-Term Liabilities*** | | |
| | Long-term debt | 30,000 |
| | Deferred Income Tax | 5,000 |
| | Other | 5,000 |
| | *Total long-term liabilities* | 40,000 |
| ***Owner's Equity*** | | |
| | Owner's investment | 50,000 |
| | Retained Earnings | 5,000 |

| | | |
|---|---|---|
| | *Total owner's equity* | 55,000 |
| | | |
| **Total Liabilities and Owner's Equity** | | **1,25,000** |
| | | |
| | | |
| **Debt Ratio (Total Liabilities / Total Assets)** | | 0.56 |
| **Current Ratio (Current Assets / Current Liabilities)** | | 2.33 |
| **Working Capital (Current Assets - Current Liabilities)** | | 40,000 |
| **Assets-to-Equity Ratio (Total Assets / Owner's Equity)** | | 2.27 |
| **Debt-to-Equity Ratio (Total Liabilities / Owner's Equity)** | | 1.27 |

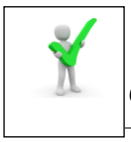
In the above example, the XYZ Limited is having Rs 125,000 as Total Liabilities and Owner's Equity and Total Assets are Rs 125,000. The current liabilities of the company are of Rs 30,000. Therefore, the Capital Structure of the company is equal to sum of Long Term Debt and Owner's Equity which is sum of Rs 40,000 and 55,000 i.e. 95,000. It can be calculated other way around as;

= Total Liabilities and Owner's Equity- Current Liabilities

= 1,25,000- 30,000=95,000

The Financial Structure of the company can be determined as below;

Financial Structure depicts equity capital, preference capital, liabilities, reserves and surpluses, long-term and short-term loans and current liabilities and provisions. Hence, Financial structure of XYZ Limited = 40,000+ 55000+ 30000= Rs 125000 hence, it refers the way how the resources in terms of entire assets of the company are utilized or employed.



***Check Your Progress-A***

**Q1. What do you mean by Capital Structure?**

_____

_____

**Q2. Differentiate between Financial Structure and Capital Structure.**

**Q3. What are the key features of Optimum Capital Structure? Can there be an optimum capital structure for a firm?**

**Q4. State True or False against the following.**

a) The optimum capital structure should augment profitability of the company.
b) The capital structure should be such that it reduces the risk at the minimum level.
c) Financial Structure refers to short term funds deployed by the company.
d) The optimum capital structure should affect variability of earnings or returns.

## 8.5 FACTORS AFFECTING CAPITAL STRUCTURE

There are various stages at which capital structure is determined by the management. The first stage is at the time of the establishment of the Firm. At this stage, Management should be very careful while finding appropriate debt-equity mix because raising capital at this stage will have long term implications. Later stages involve decisions regarding target capital structure that are dependent upon the policies *per se* expansion, modernization, retrenchment policies of the firm. Accordingly, it is responsibility of the Finance Manger to wisely design the capital structure taking into consideration various factors that affect the judgment regarding debt and equity.

The following factors should be kept in mind while determining debt-equity mix of the company;

1. **Profitability-** Profitability of an organization is one of the key factors that influence capital structure of an organization. Stability in revenues generation determines whether to go for increase in debt in the capital structure or increase in equity. Further, capital structure should be such that it increases profitability of the organization as well as magnify the returns for equity shareholders. Accordingly, increase in debt in the capital structure results into increase in profitability as debt is cheaper in comparison to other sources of capital structure (as you learnt in the previous unit that this is due to existence of tax shield). But debt financing requires more cash to service debt in terms of interest payments and repayment of principal. Similarly, cash is also required for dividends payments and redemption of preference shares. Therefore, stability in profits is required for meeting these cash requirements. Hence, analysis of Rate of Return on Total Assets, Profitability Ratio etc. is important while deciding debt-equity mix for the company. Therefore, finance manager can plan the capital structure on the basis of predictions regarding expected sales and revenues.
2. **Nature of Industry-** This is a very important factor that affects the financing pattern of a capital structure. Companies where sales are affected by wide fluctuations should opt for low degree of financial leverage. Further, many times capital intensive industries also faces risk of nonpayment of debt obligations at the time of recession then such companies should follow conservative capital structure approach and accordingly should rely more on equity finances. Highly competitive industry should also have relatively higher proportion of equity as compared to debt. Industries that witness lesser competition can utilize fixed payment bearing securities for financing its assets as these companies can meet payments on the borrowed funds. Sometimes for the non seasonal and non cyclical businesses, even investments in current assets may be taken as the characteristics of fixed assets and hence may be financed by long term funds. In case of seasonal businesses, the funds may be financed by short term loan and advances at the time of peak seasons. The businesses that face large cyclical variations require flexible capital structure that can buffer against the risk associated with the fluctuations or else may also curtail the funds in case of unfavorable circumstances.
3. **Tax Issues-** Impact of Taxation issues on the capital structure also decides the funds raising alternatives for the company. Under the provisions of Income Tax Act, dividend payable on equity shares and preference shares are not deductible as hence raises the cost of equity funds. Further, interest on debentures or loans is deducted from the revenues and hence provides the firm an advantage of tax shield. The tax saving make the debt fund cheaper as compared to equity. Graham (1996a), Oversech and Voeller (2010), Handoo and Sharma (2014) and many others investigated that higher tax benefit of debt have significantly positive impact on company's financial leverage. Therefore, tax consideration plays a significant role while designing capital structure of the company. In Indian context, a firm should also act as per the provisions with regard to corporate taxation and dividend tax norms.

4. **Flexibility-** Capital Structure of a company should be flexible so that necessary adjustments can be made as per the changing conditions and circumstances. The structure should be such that company can easily raise funds whenever needed without much difficulty and hindrance. Generally, debt instruments has got greater flexibility in terms of issue and redemption, however in case of equity, company have to fulfill a lot of legal requirements, approval and compliances before buyback. Hence as compared to equity, debt has got greater flexibility for issue and payback. Further, company should also have scope in the borrowing power to meet uncertain circumstances and conditions. Further, in case of favorable capital market conditions, preference shares can also be raised instead of debt instruments to provide flexibility in the capital structure.
5. **Earning Capacity-** If the levels of EBIT is low with respect to Earning per Share then in such a case, equity is generally preferred to debt. However, if the EBIT is high with respect to EPS then debt financing is preferred in comparison to equity. If the Return of Investment is less than $K_d$ then financial leverage will massively depress ROE and *vice versa* (Kishore Ravi)
6. **Risk-** In capital structure decisions, risk also plays an important factor while designing capital structure for a firm. Financial risk is additional risk that equity shareholder bears as result of the decision to finance debt. Further, equity shareholder inherently bears the business risk due to firm's operations however; debentures holders' doe not bear business risk because of obligatory fixed interest rate payments. Further, increase in debt ratio increases the risk faced by equity shareholders and hence have an effect on the cost of equity. Robert Hamada have quantified the effect of financial leverage on beta of the company;

$$\beta = \beta(U)[1 + (1 - T((D/E)] \ldots\ldots H - 1$$

The Hamada equation depicts how increase in debt/equity ratio increases beta. In this $\beta(U)$ is firm's unlevered beta and therefore beta would be dependent upon business risk which shall be a measure of the firm's basic business risk. (Bodhanwala Rubeh, 2006). In Hamada's Equation, D/E is the measure of financial leverage of the company. Further, business risk is influenced by demand, price, business cycles, competition levels, economic position and the likes. A firm with this high level of risk generally prefers equity to debt as there are fluctuations in the earnings. On the contrary, companies having low level of business risk prefer debt instruments as there are not much variability in the returns. Financial risk refers to additional variability per share and increased probability of insolvency that may accrue because of fixed cost sources of funds. Hence, these two risk aspects are important considerations before planning for capital structure.

7. **Growth rate** – Companies with high growth rate generally require extensive funds for its expansion activities. Such companies generally finance these additional funds from raising debt. The fast growing companies are generally dependent upon debt as

compared to equity or internal financing. Companies with stagnant growth rate should majorly go for equity financing to finance its asset structure.

8. **Marketability-** Marketability means readiness on the part of investors to purchase instruments at a given point of time and at given conditions. The acceptability of the issue of securities amongst general public also affects the capital structure decisions. This is also dependent upon the goodwill and reputation of the company in general public. But besides these, changes in market sentiments do impact the acceptability of the issues as sometimes, market favors safety, security regular income bearing securities and sometimes market sentiments are towards dividends and capital gains. Accordingly, Management should wisely takes the decisions of raising funds in the wake of general market conditions and internal policies of the company.
9. **Trading on Equity-** Trading on equity directly impact the capital structure of the company. A firm is said to be traded on equity if the Rate of Return on the shareholders funds along with long term borrowings is greater than the rate of interest on long term loans. In such a case leverage can give fruitful results in term of maximizing Earning per Share. However, if the rate of interest on long term loans or borrowing is greater than the expected rate of earnings then the leverage may adversely affect EPS. Therefore, as a Manager, you need to critically evaluate the impact of such decisions on Earnings per Share. In general, company can avail the advantage on Trading on equity when it has stability in earnings as debentures and preference shares bring a persistent obligation on the company to pay in recurring manner. In case if there are fluctuations in returns, company will face tremendous financial difficulties especially at the time of depression.
10. **Legal provisions-** The Management has to follow legal requirements and provisions regarding different type of securities to be issued by the company. For example, Banking Companies are not allowed to raise funds from debt based instruments. Raising funds from equity instruments requires more modalities to be completed as compared to debt funds. For example, as per Companies (Share Capital and Debentures) Rules, 2014 Company Limited by Shares can issue equity shares with differential rights as to dividend, voting or otherwise only when the articles of association of the company authorizes the issue of shares with differential rights.

    Taking another example of Companies (Share Capital & Debenture) Rules, 2014 from Section 71; "a Company may issue debentures with an option to convert into shares, wholly or partly, at the time of redemption but cannot issue debentures with voting rights. The following aspects need to keep in mind by the management while issuing debenture that;

    1. Debentures cannot be issued with voting rights.

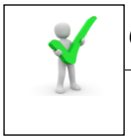
    2. A company cannot issue debentures to more than 500 people without appointing a debenture trustee, whose duty would be to protect the interest of Debenture Holders and redress their grievances.

    3. On issue of debenture a company shall create a Debenture Redemption Reserve. (DRR).

11. **Size of the Company-** Size of the company is very important factor while determining the capital structure of the firm. Small size companies are heavily dependent upon owner's funds and internal sources of financing. Large size companies may raise funds from long term debt, equity, preference shares, convertible and non convertible debentures and other sources of securities and instruments. These companies are having strong basis for bargaining for obtaining funds. Further, these companies have to tap different sources of funds to cater their need other than internal sources available. Due to restrictive covenants in loan agreement, small companies many a times, struggle to obtain long term loans and hence they are dependent on ownership securities and internal financing for arranging funds.
12. **Attitude of the investors-** Investors profile for the company should also be assessed before taking decisions regarding sources of financing for additional funds. Different sets of investors assess risk differently, accordingly they expect dividend or interest payments.
13. **Issue Cost**- Issue Cost of different types of securities should also be weighed when raising funds. In general, cost of floating the equity is higher than the cost of floating debt, therefore in normal conditions; Management can exercise choice for debt financing. Financing from internal sources will not attract any cost of issue. Further, fixed cost for commercial papers and debentures is high as compared to private debt. The economies of scale are high for fixed cost bearing instruments (Pandey I.M). On the contrary, raising additional finances for reducing Cost of Issue Paper Security shall reduce financial flexibility of the firm an shall increase risk burden on equity shareholders, therefore trade off is required from the end of management to balance the flotation cost or cost of issue.
14. **Control-** The Management of the company also needs to ensure that raising funds does not involve dilution of control of the company. Owners of private held companies are extremely careful about the loss of control and hence they could raise additional funds by way of fixed interest on debt. Since, preference share capital, debenture holders, and bondholders do not have the right to vote; therefore when the promoters do not want to lose their stake in managing affairs of the company, they prefer Preference Shares or debentures over equity shares.
15. **Purpose of Financing-** The purpose of financing should also be kept in view by the Management while taking decision regard the capital structure of the company. If funds are raised for expansion, purchase of some asset purpose, replacement of plant and machinery then company can afford to raise the funds by the issue of debentures as out of the profits so earned, interest on debentures can be paid.
16. **Government Policies-** It is important to refer to the government policies while deciding the capital structure of the company. The guidelines, rules and regulation as issued time to time by Securities Exchange Board of India need to be referred while chalking out capital issue policies of the company. Further, Company Act should also be referred while planning for raising funds. For example, Section 71 of the Companies Act, 2013 deals with the provisions relating to the issue of debentures

along with the penalties for non-compliance. Rule 18 of the Companies (Share Capital and Debentures) Rules, 2014 prescribes certain conditions to be fulfilled by a company in order to issue secured debentures. Monetary and fiscal policies also affect the capital structure decisions. As decrease in lending rates may force a firm to raise the funds from equity shares. Similarly, rigid capital market policies and regulation may force companies to seek for loans and advances from Banks and other Financial Institutions.

17. **Timings-** Timings also plays a vital role in developing framework for debt-equity mix. Timing of public offerings is yet again another consideration to be taken care by the Management of the company. Here, timing involves economic position of the country, stock market position, market sentiments, global trade scenario, monetary and fiscal policies, government policies, etc. Accordingly, on the basis of the above, one may decide whether to opt for debt or equity for raising additional funds. In case issue of equity is becoming scarce or expensive then the Management may raise funds from debt and *vice versa.* In case, company is expecting reduced interest rate in the near future then they may postpone borrowing at a later date availing the benefit of decreased interest rate. If the market sentiments prevailing are towards safety of capital then it is appropriate to raise funds from debentures or long term loans and *vice versa*.
18. **Characteristics of the Company-** Another consideration while designing capital structure is the key features of the company in term of size, credit worthiness, goodwill of the company and freedom of management in terms of decision making etc. Companies having high credit rating can easily obtain funds from the market. In case credit rating of the company is poor then it would be very challenging for the company to raise funds from the market.
19. **Provision for Future-** Provisions of future is another factor that should be kept in mind while designing capital structure. This means that these should always be scope of issuing securities or raising funds for unforeseen circumstances. Debt and Equity should not be employed to the fullest rather in large companies different type of securities should be given its place in debt-equity mix.



***Check Your Progress- B***

**Q1. Discuss any six factors that influence decision makers in finalizing capital structure of a company?**

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**Q2. Discuss how size of the company influences the planning of a capital structure?**

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**Q3. Fill in the Blanks.**

a) _____of different types of securities should also be weighed while raising funds.

b) A firm is said to be _____ if the Rate of Return on the shareholders funds along with long term borrowings is greater than the rate of interest on long term loans.

## 8.6 LEGAL REQUIREMENTS REGARDING CAPITAL STRUCTURE

The finance manager while deciding debt-equity mix of an organization should refer to the legal and regulatory framework regarding issue and redemption of securities and debentures. Generally, long term loans from Banks and Financial institutions require security of assets or mortgage of some property. Further, secured debentures also require some asset to be pledged. Further, guidelines as issued by SEBI time to time regarding issue and redemption of securities need to be referred by the finance manager. For example, at the time of filing of draft offer document and final offer document issuers has to ensure that it has applied to one or more approved stock exchanges and for the listing of such securities credit rating has been taken from at least one credit rating agency. Similarly, in case of seeking loans from Commercial Banks, requirements as issued by RBI should be fulfilled by the organization before applying for the funds.

Let us read few guidelines issued by Securities and Exchange Board of India that impact decisions pertaining to the capital structure;

"As per Securities and Exchange Board of India (Issue of Capital And Disclosure Requirements) Regulations, 2018, an issuer shall not be eligible to make an initial public offer if there are any outstanding convertible securities or any other right which would entitle any person with any option to receive equity shares of the issuer: Further Eligibility requirements for an initial public offer, are (1) An issuer shall be eligible to make an initial public offer only if: a) it has net tangible assets of at least three crore rupees, calculated on a restated and consolidated basis, in each of the preceding three full years (of twelve months each), of which not more than fifty percent are held in monetary assets: Provided that if more than fifty percent of the net tangible assets are held in monetary assets, the issuer has utilized or made firm commitments to utilize such excess monetary assets in its business or project;

Provided further that the limit of fifty per cent on monetary assets shall not be applicable in case the initial public offer is made entirely through an offer for sale. b) it has an average operating profit of at least fifteen crore rupees, calculated on a restated and consolidated basis, during the preceding three years (of twelve months each), with operating profit in each of these preceding three years; c) it has a net worth of at least one crore rupees in each of the preceding three full years (of twelve months each), calculated on a restated and consolidated basis; d) if it has changed its name within the last one year, at least fifty per cent. of the revenue, calculated on a restated and consolidated basis, for the preceding one full year has been earned by it from the activity indicated by its new name"

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Reference: Securities and Exchange Board of India (Issue of Capital and Disclosure Requirements) Regulations, 2018, Retrieved from https://www.sebi.gov.in/legal/regulations/sep-2018/securities-and-exchange-board-of-india-issue-of-capital-and-disclosure-requirements-regulations-2018-_40328.html, last accessed 10/2/2020

Let us refer to one of the rules that influence issue of share capital and debentures;

**Companies (Share Capital and Debentures) Rules, 2014**

"Company limited by shares can't issue equity shares with differential rights as to dividend, voting or otherwise, unless the articles of association of the company authorizes the issue of shares with differential rights; the issue of shares is authorized by an ordinary resolution passed at a general meeting of the shareholders. the shares with differential rights shall not exceed twenty-six percent of the total post-issue paid up equity share capital including equity shares with differential rights issued at any point of time; the company having consistent track record of distributable profits for the last three years; the company has not defaulted in filing financial statements and annual returns for three financial years immediately preceding the financial year in which it is decided to issue such shares; the company has no subsisting default in the payment of a declared dividend to its shareholders or repayment of its matured deposits or redemption of its preference shares or debentures that have become due for redemption or payment of interest on such deposits or debentures or payment of dividend; the company has not defaulted in payment of the dividend on preference shares or repayment of any term loan from a Public Financial Institution or State Level Financial Institution or Scheduled Bank that has become repayable or interest payable thereon or dues with respect to statutory payments relating to its employees to any authority or default in crediting the amount in Investor Education and Protection Fund to the Central Government".

Reference: COMPANIES (SHARE CAPITAL AND DEBENTURES) RULES, 2014, Retrieved from https://www.sebi.gov.in/sebi_data/attachdocs/apr-2017/1492085873402.pdf, last accessed 10/2/2020

Therefore, from the above decisions we may infer that while planning the capital structure of a company various rules and regulations issued by regulatory authorities should be referred by Finance mangers as these are one of the major determinants in capital structure.

## 8.7 SUMMARY

In this unit, you learnt that appropriate capital structure is an important decision for any organization. The company's capital structure represents its investment and financing strategy. Therefore, it is not only important for company's profitability and growth but it also give company an ability to deal with the competitive environment. While planning the capital structure, it should be borne in mind that there is no particular capital structure that need to be followed by an organisation rather these decisions should be taken by the Managers after considering numerous factors affecting the business entity.

## 8.8 GLOSSARY

**Capital Structure** refers to the proportion of long term sources of funds in the capitalization of the firm. The proportion of equity shares, preference shares, debentures, long term loans, retained earnings, etc. constitute the firm's capital structure.

**Financial Structure** depicts equity capital, preference capital, liabilities, reserves and surpluses, long-term and short-term loans and current liabilities and provisions.

**Optimum capital structure** is basically that proportion of debt and equity that will maximise value of the firm.

**Trading on Equity** refers to a situation where company earns higher rate of return on the capital employed as compared to the expenses incurred in paying fixed interest charges or dividend.

## 8.9 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

Q4. State True or False against the following.

a) True
b) True
c) False
d) False

Check Your Progress –B

Q3. Fill in the Blanks.

a) Issue Cost
b) traded on equity

## 8.10 REFERENCES


- Kishore Ravi M.(2009), "Chapter 9 Capital Structure Decisions" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 251-280
- Khan, M.Y. and Jain, P.K.,( 1992), "Chapter 16 Designing Capital Structure' Financial Management Text and Problems., Second Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, pp 16.1-16.29
- Sristava Rajiv and Mishra Anil (2016), Chapter 17 Designing Capital Structure" in Financial Management, Oxford University Press, New Delhi, pp 439-464
- Kuchhal S.C. (1980), Chapter 22 Planning the capital structure" in Financial management: An Analytical and Conceptual Approach, Seventh Edition, pp 445-488
- Pandey, I.M. (2010), "Chapter 14 Financial and Operating Leverage" in Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi
- Rustagi R.P. (2011), Chapter 14 Capital Structure : Planning and Designing" in Financial Management- Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd. pp 434-449
- Van Horne, James C. and Wachowicz, John M. Jr (2009)," Chapter 17 Capital Structure Determination" in Fundamentals of Financial Management, 13th edition, Pearson Education Limited, pp 451-473
- Rubeh J. Bohanwala(2006), Chapter 9 Designing Capital Structure, in Financial Management, Second Edition, Taxmann Allied Services (P) Ltd. , 212- 233

**Web Linked Referred**

- https://shodhganga.inflibnet.ac.in/bitstream/10603/60090/11/11_chapter%203.pdf, last accessed 9/12/2019
- Basu Kaushik and Rajeev Meenakshi (2013), Determinants Of Capital Structure Of Indian Corporate Sector: Evidence Of Regulatory Impact, Retrieved from http://www.isec.ac.in/WP%20306%20%20Kaushik%20Basu%20and%20Meenakshi%20Rajeev.pdf, Last accessed 10/2/20202

- MacKinlay Andrew (2012)(How) Do Taxes Affect Capital Structure?, Retrieved from https://faculty.wharton.upenn.edu/wp-content/uploads/2012/04/MacKinlay_Andrew_JMP.pdf, Last accessed 10/2/20202
- Handoo, A., Sharma, K., A study on determinants of capital structure in India, IIMB Management Review(2014), http://dx.doi.org/10.1016/j.iimb.2014.07.009 Retrieved from https://www.researchgate.net/publication/264426503_A_study_on_determinants_of_capital_structure_in_India, last accessed 10/2/2020


## 8.11 SUGGESTED READINGS


1. "Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
2. "Gopalakrishnan", Project Management, TMH, 2007.
3. "H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.
4. "Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.
5. "Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.
6. "Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.
7. "Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.
8. "Prasanna Chandra", Project Management, TMH,2007.
9. "Chowdry", Project Management, TMH,2007.
10. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition
11. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
12. Financial Management: I.M. Pandey.
13. Financial Management: Theory and Practices- Prasanna Chandra.
14. Financial Management: Khan and Jain.

## 8.12 TERMINAL QUESTIONS

Q1. What are the various factors that influence capital structure decisions?

Q2. What do you mean by capital structure of a company? Discuss the various feature of optimum capital structure.

Q3. What do you mean by optimum capital structure? What are the various factors that influences optimum capital structure?

Q4. 'Optimal Capital structure does not exist in the real world'. Critically assess this statement.

# UNIT 9 THEORIES OF CAPITAL STRUCTURE



## 9.1 INRODUCTION

In order to operate or manage a company, finance is required. The main sources of finance for the companies are debt and equity. The decision regarding the proportion of debt and equity is termed as capital structure. So the term capital structure refers to the relationship between various long term sources of financing such as equity share capital, preference share capital and debentures. Capital structure decision is the very crucial managerial decision as it influences the shareholders return and risk and consequently value of firm. The primary objective of financial management is to maximize shareholder's wealth, the main issue is: what is the relationship between capital structure and firm value? Also, what is relationship between capital structure and cost of capital? Important to remember is value of firm and cost of capital is inversely related. At a certain level value of earnings, value of firm is maximized when the cost of capital is minimized and vice-versa. There are different views on capital structure and value of firm. Some states that there is no relationship between value of firm and its capital structure. Other states that use of debt has a positive effect on firm value up to certain point and negative effect thereafter as more use of debt increase the financial risk and it increase the cost of equity of the firms.

In the previous unit you have learned about the term capitalization, capital structure and financial structure, importance of capital structure, determinants effects the capital structure decision of the company etc. In this unit you will learn about the different theories proposed by different authors to explain the relationship between capital structure, cost of capital and the value of the firm.

## 9.2 OBJECTIVES

After reading this unit you will be able to:

- Understand the various theories of capital structure
- Know the concept of capital gearing.
- Know about the different costs due to market imperfections
- Understand the Pecking Order Theory

## 9.3 THEORIES OF CAPITAL STRUCTURE

Capital structure of a company means the combination of financial mix used by the firm. Theory of capital structure is related to the cost of capital. The decision regarding the capital mix is based on the objective of achieving the maximization of shareholders wealth. Debt and equity are two major sources of funds for a company. The theories of capital structure states the proportion of debt and equity in the capital structure.

**Assumptions**

1. There are only two types of funds: debt and equity.
2. Total assets of the firm are given.
3. EBIT is given and remains constant.
4. Dividend payout ratio is 100% i.e. no retained earnings.
5. Business risk is not affected by any financing decision i.e. its constant.
6. No corporate and personal taxation.
7. The investors should bear the same subjective probability of expected operating profit of the firm.
8. Capital structure can be altered without incurring transaction cost.

**Different theories of Capital Structure**

- Net Income Approach
- Net Operating Income Approach
- The Traditional Approach
- Modigliani and Miller Approach
    a) Without taxes
    b) With taxes

## 9.3.1 NET INCOME APPROACH (THEORY OF RELEVANCE )

Net income approach is given by Durand. This approach suggest that a firm can minimize its weighted average cost of capital (WACC) and increase the value of firm as well as market price of share by employing more and more use of debt. So the theory propounds that a company can increase its value and decrease the overall cost of capital by increasing the proportion of debt in its capital structure. This approach is based on following assumptions;

1. Debt is the cheaper source of finance than equity.
2. There are no taxes levied.
3. Risk perception of investors does not change by use of more debt.

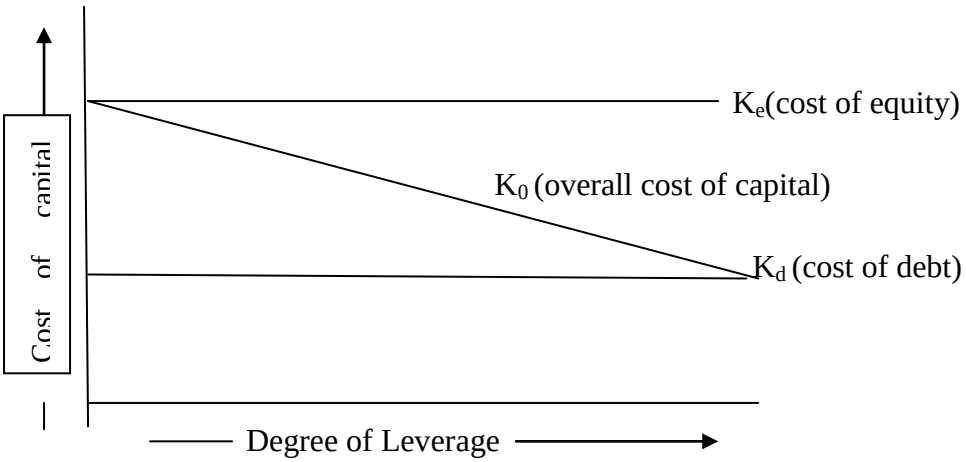



**Fig 9.1 The NI approach: Effect of leverage on cost of equity**

The argument in favor of net income approach is that as the share of debt financing increase in the capital structure, the proportion of less expensive source of fund increases. This result in decreasing in the overall Weighted Average Cost of Capital (WACC) leading to an increase in the value of firm. The reason for assuming cost of debt to be less than cost of equity is that interest rates are usually less than dividend due to element of risk (debt instruments are more safer than equity) and also they are tax deductible expense .

On the other hand when the amount of debt in capital structure decreases or when financial leverage is reduced, the weighted average cost of capital will increase and the value of firm will decrease. The net income approach showing the effect of leverage on overall cost of capital has been given following:

The total market value of firm on the basis of Net Income Approach can be ascertained as below;

V= S+D

Where, V = Market value of firm

S= Market value of equity shares

$$= \frac{\text{Earnings available to equity shareholders}}{Equity\ capitalisation\ rate}$$

D= Market value of debt

And, overall cost of capital or weighted cost of capital can be calculated as;

$K_0 = \frac{EBIT}{V}$

**Illustration 1**

a) A company is expecting a net income of Rs. 90,000. It has Rs. 2, 00,000, 8% debentures. The cost of equity or capitalization rate is 10%. Calculate the value of the firm and overall capitalization rate according to the Net Income Approach (ignoring income-tax).
b) If the debenture debt is increased to Rs. 3, 00,000, what shall be the value of firm and the overall capitalization rate?

Solution:

**a) Calculation of the value of firm**

| | |
|---|---|
| Net Income | 90,000 |
| Less: interest on debentures | 16,000 |
| Earnings available for equity shareholders | 74,000 |

Equity capitalization rate is 10%

Market value of Equity (S) = 74,000× $\frac{100}{10}$ = 7, 40,000

Market value of debentures (D) = 2, 00,000

Total value of firm(S+D) = 9, 40,000

**Overall cost of capital = $\frac{90,000}{9,40,000}$ × 100 = 9.57%**

**b) Calculation of value of firm**

| | |
|---|---|
| Net Income | 90,000 |
| Less: Interest on debentures | 24,000 |
| Earnings available for equity shareholders | 66,000 |

Equity capitalization rate is 10%

Market value of equity (S) = 66,000×$\frac{100}{10}$ = 6, 66,000

Market value of debentures (D) = 3, 00,000

Total value of firm (S+D) = 9, 66,000

**Overall cost of capital = $\frac{90,000}{9,66,000}$×100 = 9.32%**

Thus, it is clear that as we increase the debt financing value of firm increased and overall cost of capital decreased.

## 9.3.2 NET OPERATING INCOME APPROACH

This theory was also suggested by Durand and is opposite view of the net income approach. This approach suggests that capital structure decision of firm is irrelevant and any change in leverage or debt decision has no impact on the market value of a firm as well as the market price of equity shares. It implies that the overall cost of capital remains the same whether the debt-equity mix is 20: 80 or 50:50 or 100:0. The assumptions of this theory are;

1. The market capitalize the value of the firm as a whole;
2. The business risk remains constant at every level of debt equity mix;
3. There are no corporate taxes.

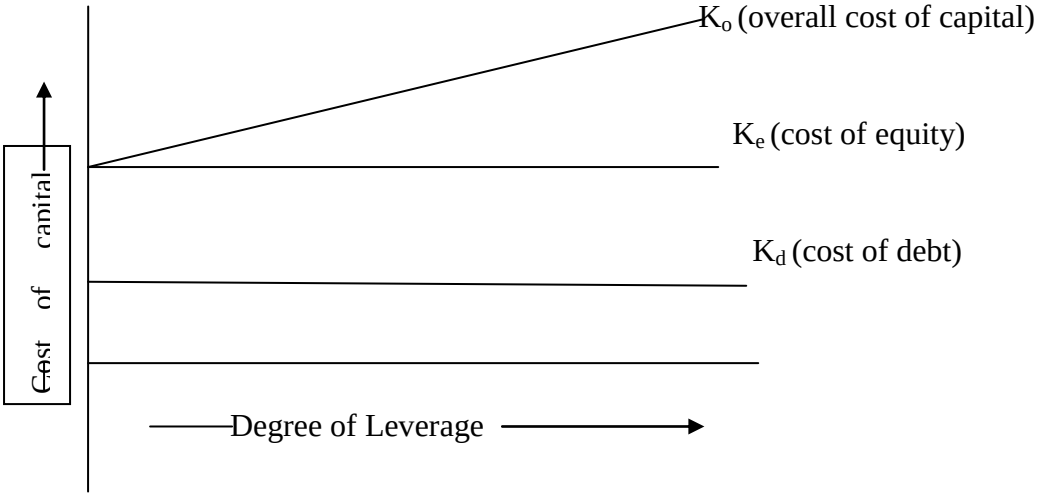



**Fig 9.2 The NOI approach: Effect of leverage on cost of equity**

The reasons propounded for such assumptions are that the increased use of debt increases the financial risk of the equity shareholders and hence the cost of equity increased. But on the other side cost of debt remains the same with the increasing proportion of debt as more use of debt does not increase the financial risk of the debt holders. So increased use of debt increases the cost of equity capital but cost of debt remains the same hence the benefits of infusing debts are negated by the simultaneously increase in the rate of return of equity shareholders. According to the Net Operating Income (NOI) approach, the financing mix is irrelevant and it does not affect the value of firm either way.

The Net Operating Income (NOI) Approach showing the effect of leverage on overall cost of capital has been given following;

The value of firm on the basis of Net Operating Income (NOI) Approach can be determined as below;

$$V = \frac{EBIT}{K_0}$$

Where, V is value of firm

EBIT= Net operating income or earnings before interest and tax.

$K_0$ = Overall cost of capital

The market value of equity, suggested by this approach is the residual value which is determined by deducting the market value of debentures from the total market value of the firm.

S= V-D

S= Market value of equity shares

V= Total market value of firm

D= Market value of debt

Equity cost of capital or overall capitalization rate can be calculated as;

$$\text{Cost of Equity or Capitalization rate } (K_e) = \frac{\text{Earnings after Interest and before tax}}{\text{Market value of firm- Market value of debt}}$$

**Illustration-2**

a) Net operating income a company is expecting is Rs.1, 00,000. It has Rs. 6, 00,000, 6% debentures. The overall capitalization rate is 10%. Calculate the value of firm and equity capitalization rate (cost of equity) according to the net operating income approach.
b) If debentures are increase to Rs. 8, 00,000. What will be the effect on the value of firm and the equity capitalization rate?

**Solution:**

Net operating income = 1, 00,000

Overall cost of capital is 10%

$$\text{Value of firm} = 1,00,000 \times \frac{100}{10} = 10,00,000$$

| | | |
|---|---|---|
| Value of firm | = | 10, 00,000 |
| Market value of debt | = | 6, 00,000 |
| Market value of equity | = | 4, 00,000 |

Cost of Equity or Capitalization rate ($K_e$) = $\frac{1,00,000 - 36,000}{10,00,000 - 6,00,000} \times 100$

=16%

b) If debentures are increased to 8, 00,000, the value of firm will not change but cost of equity capital will increase to 26%.

Cost of equity or capitalization rate ($K_e$) = $\frac{1,00,000 - 48,000}{10,00,000 - 8,00,000}$

$= \frac{52,000}{2,00,000} \times 100 = 26\%$

## 9.3.3 THE TRADITIONAL APPROACH ( INTERMEDIATE APPROACH)

Net Income Approach (NI) and Net Operating Income Approach are two extreme approaches. Traditional approach suggested by Ezra, Solomon and Fred is a mid way approach and is also known as intermediate approach. Traditional approach of capital structure states that there is right combination of debt-equity at which the weighted average cost of capital (WACC) is minimum and value of firm is maximum. As per this approach the debt should exist in the capital structure only up to specific limit beyond which the cost of capital would increase as the increased debt will increase the financial risk of the equity shareholders which subsequently increase the cost of equity capital and result in decrease in value of firm.

The traditional view point on the relationship between the leverage cost of capital and value of firm has been shown in the figure below;

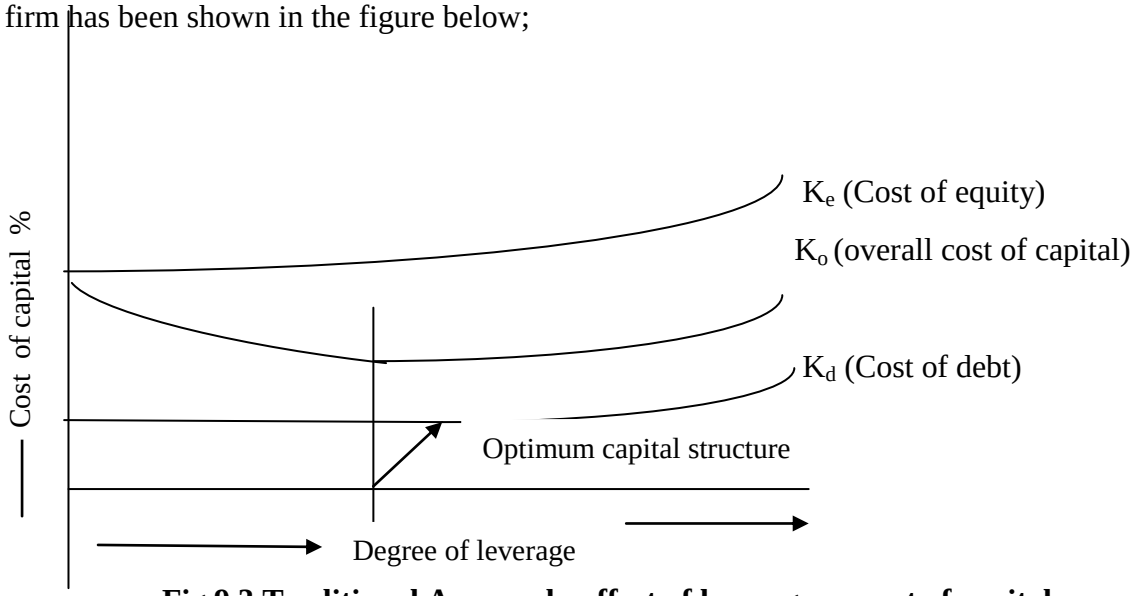



**Fig 9.3 Traditional Approach: effect of leverage on cost of capital**

**Assumptions of Traditional Approach**

1. The rate of interest on debt remains constant up to certain period and after that with increase in leverage cost of debt also increases.
2. The rate of return expected by equity shareholders remains constant or increase gradually. But after the optimal level financial risk increases and rate expected by equity shareholders increased rapidly.
3. As a result of the activity of rate of interest and rate of return the WACC of capital first decreases and then increases.

**Illustration -3**

Compute the market value of firm, value of shares and the average cost of capital from the following information;

EBIT 2, 00,000

Total investments 10, 00,000

Cost of equity

a) No debt 10%

b) If firm uses Rs.4,50,000 debentures 11%

c) If firm uses Rs. 6,50,000 debentures 13%

Assume the Rs. 4, 50,000 debentures can be raised at 5% rate of interest where as Rs. 6, 50,000 debentures can be raised at 6% rate of interest.

**Solution:**

Calculation of market value of firm, market value of shares, Average cost of capital

| | a) No Debt | b) 4,50,000 at 5% | c) 6,50,000 at 6% |
|---|---|---|---|
| EBIT | 2,00,000 | 2,00,000 | 2,00,000 |
| Less; Interest | - | 22500 | 39000 |
| Earnings available for equity shareholders | 2,00,000 | 1,77,500 | 1,61,000 |
| Cost of equity | 10% | 11% | 13% |
| Market value of equity shares | 2,00,000×100/10 = 20,00,000 | 2,00,000×100/11= 16,13,636 | 2,00,000×100/ 13= 12,38,461 |
| Market value of debentures | - | 4,50,000 | 6,50,000 |
| Total value of firm | 20,00,000 | 20,63,636 | 18,88,461 |

| | | | |
|---|---|---|---|
| Average cost of capital = EBIT/ Total value of Firm | 2,00,000/ 20,00,000 =10% | 2,00,000/20,63,636 = 9.69% | 2,00,000/18,88 ,461 = 10.59% |

From above illustration it can be found that at 4, 50,000 debentures the value of firm is Rs. 20, 63,636 and cost of capital is 9.69% as the debentures increased to Rs. 6,50,000 the value of firm decreases to Rs. 18,88,461 and cost of capital increases to 10.59%.

## 9.3.4 MODIGLIANI AND MILLER APPROACH

M&M hypothesis is alike the Net operating Income approach if taxes are ignored. However, when taxes are assumed to exist, their hypothesis is similar to the net income approach.

**a) In the absence of taxes. (irrelevance proposition)** The theory proves that the cost of capital is not affected by the capital mix of the company or says that debt-equity mix has no impact on the total value of firm. The reason argued is that a debt is the cheaper source of finance than the equity and with the increase of debt in the capital structure as a source of finance, the cost of equity increases. And this increase of cost of equity offset the advantage of the low cost of debt. Thus, although the financial leverage affects the cost of equity, the overall cost of capital remains same. The theory emphasizes the fact that a firm's operating income is a determinant of its total value. This theory further states that after a certain limit of debt in the capital structure, the cost of debt increases but the cost of equity falls thereby balancing the two costs. M&M view states, two firms similar in all respects or two identical firms except in composition of their capital structure cannot have different market values or cost of capital because of arbitrage process. The shareholders of overvalued firm will dispose of their shares and will purchase the shares of undervalued firm and this process will go on till the two firms will attain the same market value.

**Assumptions**

1. There are no corporate taxes.
2. There is a perfect capital market.
3. Investors act rationally.
4. Dividend pay-out ratio is 100%
5. Expected yield/return of all the firms has identical risk factors.
6. The cut-off point of investment in a firm is a capitalization rate.

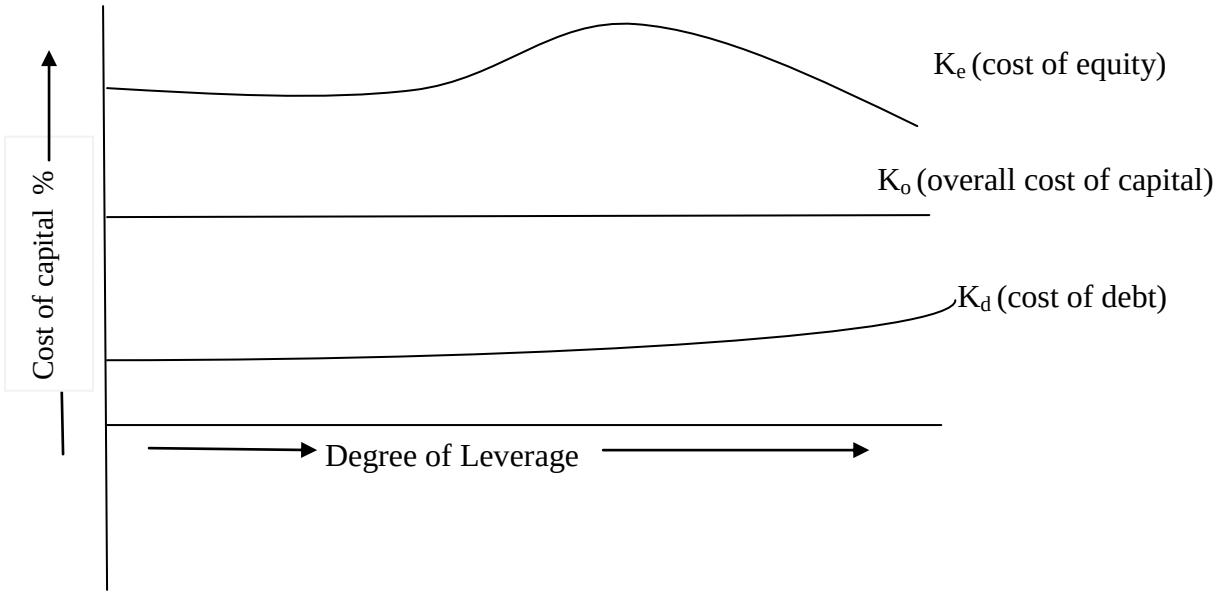



**Fig 9.4 MM Theory of irrelevance: effect of leverage on cost of debt, equity and overall cost**

**Illustration -4**

The given information available regarding Aspire Air Co. Ltd.

1. Aspire Ltd currently has no debt, it's totally Equity Company.
2. EBIT = Rs 24 Lakhs
3. There are no taxes , so T=0%
4. Company pays all its income as dividend.
5. If Aspire Ltd. begins to use debt, it can borrow at the rate of $k_d$ = 9%. This rate is constant and independent of the amount of debt.
6. The required rate of return of shareholders $K_e$ = 12% if no debt used.

Using MM model without taxes and assuming a debt of Rs. 1 crore, you are required to calculate.

a. Firm's total market value.
b. Firm's value of equity.
c. Firm's leverage cost of equity.

**Solution :**

a. Firm total market value

$V = \frac{EBIT}{K_e} = \frac{24,00,000}{.12}$ = 2 crore

b. Firm's market value of equity

S = V-D
= 2-1 = 1 crore

c. Firm's leverage cost of equity

Cost of equity + (cost of equity- cost of debt)
= 12% + (12%- 9%)
= 15%

**b) When corporate taxes are assume to exist (relevance proposition)**. Modigliani and Miller in their article have recognized this that the value of firm will increase and cost of capital will decrease with the use of debt as interest on debt are the tax deductible expense. Thus the optimum capital structure can be achieved by maximizing the debt in the capital structure.

Value of unlevered firm ($V_u$) = $\frac{\text{Earnings before interest and tax}}{\text{overall cost of capital}}$ i.e. $\frac{EBIT}{K0}$ (1-t)

And, Value of levered firm is: $V_L = V_U + tD$

tD is the discounted present value of tax savings from the tax deductibility of interest charges , t is the rate of tax and D is the debt in the mix.

Value of levered and unlevered firm under the MM Model (assuming the corporate taxes exist) has been shown in the following figure.

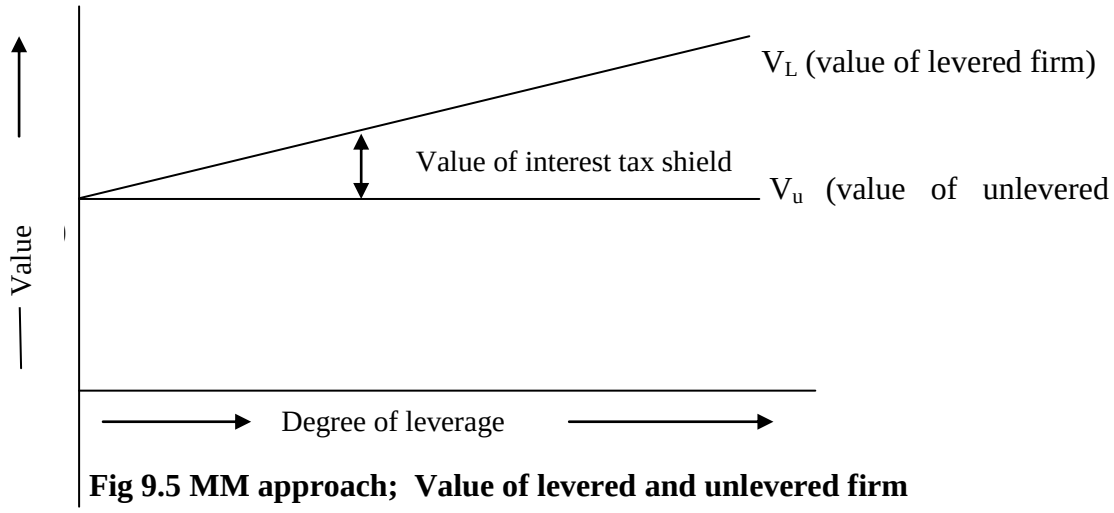



**Fig 9.5 MM approach; Value of levered and unlevered firm**

**Illustration -5**

There are two firms A and B identical in all respects except A does not use any debt financing, while B has Rs. 50,000 5% debentures in it capital mix. Both the firm have EBIT of Rs. 25,000 and equity capitalization rate is 10%. Assuming the corporation tax of 50% calculates the value of firm using M&M approach.

The market value of firm A which does not use any debt.

$$V_u = \frac{EBIT\,(1-t)}{K_0}$$

$$= \frac{25000}{10\%}(1-.5)$$

$$= \text{Rs. } 1,25,000$$

The market value of firm B which uses debt financing of Rs. 50,000

$V_L = V_u + t\,D$

$= 1,25,000 + .5 \times 50,000$

$= 1,25,000 + 25,000$

$= \text{Rs. } 1,50,000$

**How does arbitrage process works**

From the above illustration -5 we noticed that market value of firm B which uses debt financing also in its capital structure is higher than the market value of firm A which used only equity finance. According to M&M such situation cannot persist for a long period because of the arbitrage process. Equity investors of firm B will sell their equity and invest in firm A with personal leverage. When investors sell their equity in firm B and buy the equity in firm A , the market value of firm B will decline and market value of firm A tends to rise. This process continues until the market value of both the companies become equal because only then the possibility of earning a higher income, for a given level of investment and leverage, by arbitraging is eliminated. In arbitrage process, investors who switch their holdings will gain.

**Illustration -6**

The following is the data regarding two companies 'X' and 'Y' belonging to the same equivalent risk class;

| | Company X | Company Y |
|---|---|---|
| Number of Ordinary shares | 1,00,000 | 1,50,000 |
| 8% Debentures | 50,000 | - |
| Market Price per share | Rs. 1.30 | Rs. 1.00 |
| Profit before interest | Rs. 20,000 | Rs. 20,000 |

All profits after paying debenture interest are distributed as dividends.
You are required to explain how under M&M approach, an investor holding 10% of shares in Company 'X' will be better off in switching his holding to company 'Y'.

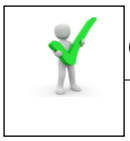
**Solution;** M&M approach holds the view that the two firms identical in all respects except the different capital structure cannot have different market values because the arbitrage process will take place and investor will engage in 'personal leverage' as against the 'corporate leverage' and derive the total value of two firms together. In the given problem, arbitrage will work out as below:

1. The investor will sell in the market 10% of shares in company X for Rs. 13,000 ( $\frac{10}{100}$× 1,00,000×1.30 )
2. Investor will raise a loan of Rs. 5,000 ($\frac{10}{100}$×50,000) to take a advantage of personal leverage as against the corporate leverage as company Y does not use any debt content in its capital structure.
3. With total amount of Rs. 18,000 realized from 1 and 2 the investor will buy 18,000 shares in company 'Y'. Thus he will have 18,000 shares in company 'Y'.

**The investor will gain by switching his holding as below;**

| | Rs. |
|---|---|
| Present income of the investor in company 'X'; | |
| Profit before interest of the company | 20,000 |
| Less: Interest on debentures | 4,000 |
| Profit after interest | 16,000 |
| Share of the investor = 16,000× $\frac{10}{100}$ | 1600 |
| **Income of the investor after switching holding to company 'Y'** | |
| Profit before interest for company | 20,000 |
| Less: Interest | nil |
| Profit after interest | 20,000 |
| Share of investor = 20,000 × $\frac{18,000}{1,50,000}$ | 2400 |
| Less: interest paid on loan taken 8% of Rs. 5000 | 400 |
| Net income of the investor | 2000 |

As the net income of the investor in company ' Y' is higher than the income in company 'X' due to switching the holdings, the investor will gain switching his holding to company 'Y'.



## *Check Your Progress- A*

**Q1. What is capital structure?**

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**Q2. What is optimal capital structure?**

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**Q3. Name various theories of capital structure?**

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**Q4. Discuss the relationship between leverage and cost of capital as per net income approach.**

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**Q5. What are the assumptions of traditional approach?**

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**Q6. Write a note on 'Arbitrage Process'.**

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**Q7. A company is expecting a net income of Rs. 10,000. It has Rs. 50,000, 6% debentures. The cost of equity or capitalization rate is 10%. Calculate the value of the firm and overall capitalization rate according to the Net Income Approach.**

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## 9.4 CAPITAL GEARING

Capital gearing is the British term which states the amount of debt a company has relative to its equity. In United States capital gearing is also known as financial leverage. Companies with higher capital gearing will have large amount of debt relative to its equity. The Gearing ratio is the measure of financial risk and expresses the amount of company's debt relative to its equity.

The example given below illustrate clearly the terms of 'high gear' and 'low gear'.

| Extracts of Balance sheet | (Rs.) | |
|---|---|---|
| Liabilities | X. Ltd | Y.Ltd. |
| Equity Share Capital | 4,50,000 | 6,00,000 |
| 10%Preference share capital | 2,50,000 | 2,00,000 |
| 7% debentures | 3,00,000 | 2,00,000 |
| Total Capitalization | 10,00,000 | 10,00,000 |

The total capitalization of above two companies is the same, but the capital structure is different. X Ltd. is high geared as the ratio of equity capital in the total capitalization is only 45%. But Y Ltd. is low geared as its capital structure comprises of 60% equity capital and 40% of fixed income bearing securities.

**Significance of Capital Gearing**

A proper capital gearing is very important for the smooth running of an enterprise as it has a direct bearing on the divisible profits of a company. In a low geared company, fixed cost of capital by way of fixed dividend to preference shareholders and interest to debenture holders are low whereas in high geared company fixed cost is higher leaving lesser divisible profits for the equity shareholders.

Role of capital gearing in a company is as important as gears of an automobile. In automobiles, gears are used to maintain the desired speed. Initially, an automobile starts with low gear, but as soon as it gets momentum, the low gear is changed to the high gear to get better speed. Similarly, a company may be started with low gear i.e. high stake of equity share and as soon as the business gets the momentum, it may subsequently issue the fixed

cost securities i.e. preference shares and debentures. It may be noted that capital gearing affects not only the equity shareholders but the debenture holders, creditors, financial institutions, the financial managers and others are also affected with the capital gearing.

**Capital Gearing and Trade Cycles**

The techniques of capital gearing can be successfully employed by a company during various phases of trade cycles, i.e. during the conditions of inflation and deflation. The effect of capital gearing during various phases of trade cycle is discussed below;

**1. During inflation or Boom period.** During this period company should follow the policy of high gear as the profits of the company high and it can easily pay the fixed cost of debentures and preference shares. Further, during the boom period, the rate of earnings of the company is usually higher than the fixed rate of interest. By adopting the policy of high gear company can increase its earnings per share and thereby a higher rate of dividend.

**2. During deflation and Depression period.** During this period earnings of the company are low and it cannot meet the fixed cost without lowering the divisible profits and rate of dividend. It is, therefore, better for a company to remain in low gear and not to use the fixed interest bearing securities as source of finance during such period.

## 9.5 MARKET IMPERFECTIONS

There is a problem with M&M with-tax theory, because companies' capital structures are not always entirely made up of debt financing. Companies are discouraged from following this recommended theory because of the existence of factors like bankruptcy costs, agency costs and tax exhaustion. All factors which Modigliani and Miller failed to take in account.

**Bankruptcy Cost**

M&M approach assumes that there is a perfect capital market and therefore a company would always be able to raise funds and avoid bankruptcy. But in real world when a company employs more and more debt in its capital structure, financial risk of the company will increases. The major disadvantage of a company having high level of debt is that there is a possibility of company's failure on payment of its increased interest payments and hence being declared bankrupt. If shareholders and debenture holders become aware about the possibility of the bankruptcy risk, they will demand to be compensated for this additional bankruptcy risk. Therefore, the cost of equity and cost of debt will increase and therefore ultimately WACC will increase and share prices will reduce. It is interesting to note that shareholders are the one who are suffering from higher degree of bankruptcy risk as they come last in the creditor hierarchy on liquidation. The firm using the equity finance only may not have to face the bankruptcy cost because it may not pay the dividends to the shareholders if it has no sufficient profits. Although the use of debt provide the tax shield to the firm but the bankruptcy cost works against the advantage of leverage.

## Agency Costs

Agency costs arise because of the conflict of interest between the principal and agents. In large companies, the fund providers (principals) are not able to actively manage the company. They employ 'agents' (managers) and it is possible for these agents to act in ways which are not always in the best interest of the equity holders or debt-holders. Since we are currently concerned with the issue of debt, we will assume there is no potential conflict of interest between shareholders and the management and that the management's primary objective is to maximize the shareholders wealth. Therefore, the management may take decisions that benefit the equity shareholders at the expense of the debt-holders. Management may raise funds from debt-holders stating that the funds will be invested in low-risk projects, but once they receive the funds they decide to invest in a high risk/high return projects. This action could potentially benefit shareholders as they may benefit from the higher returns, but the lenders would not get a share of the higher returns since their returns are not dependent on company performance. So to safeguard their investments, the suppliers of funds (lenders) put restrictive conditions in the loan agreement resulting into lesser freedom to the management (borrowers) in decision making called agency costs. These restrictive conditions include how much further debt can be raised, set a target gearing ratio, set a target current ratio, restrict the payment of excessive dividends, restrict the disposal of major assets or restrict the type of activity the company may engage in.

The agency costs increase with the increases of debt in the capital mix as more and more restrictions are put by the lenders to secure their investments in the firm. They may provide increased debt at a higher rate of interest. Thus a highly leveraged firm has more of agency costs as compared to a low geared firm.

## Tax Exhaustion

Interest is tax-deductible expense means that as a company employs more debt (gears up), it's paying more interest and it shields more of its profits from corporate tax (reduce its taxable income). So the company can reduce its WACC by employing more debt over equity. But as a company use more debt and subsequently pay more interest , then at one time it reaches at a point where interest are equal to the profits and any interest payment beyond this level will not receive any tax relief.

This is the point where companies become tax - exhausted, i.e. interest payments are no longer tax deductible, as additional interest payments exceed profits and the cost of debt rises significantly from Kd (1-t) to Kd. Once this point is reached, debt loses its tax advantage and a company may restrict its level of gearing.

# 9.6 PECKING ORDER THEORY

The pecking order theory is in contrast to the other capital structure theories which are aimed to find the optimum capital structure by studying the trade –off between the advantages and disadvantages of debt finance. But in this theory, there is no search for an optimal capital structure. This theory was first suggested by Donaldson in 1961 and it was modified by Myers and Nicolas Majluf in 1984 (modified Pecking order theory) and made it more popular. According to Donaldson theory, a firm has well defined order of hierarchy for raising finance. They prioritize their source of financing (from internal to external) according to cost of financing, preferring to raise equity as financing means of last resort. So internal funds are used first. When they are depleted debt financing used and when it is not sensible according to managers to issue more debts then funds raised through the issue of equity shares.

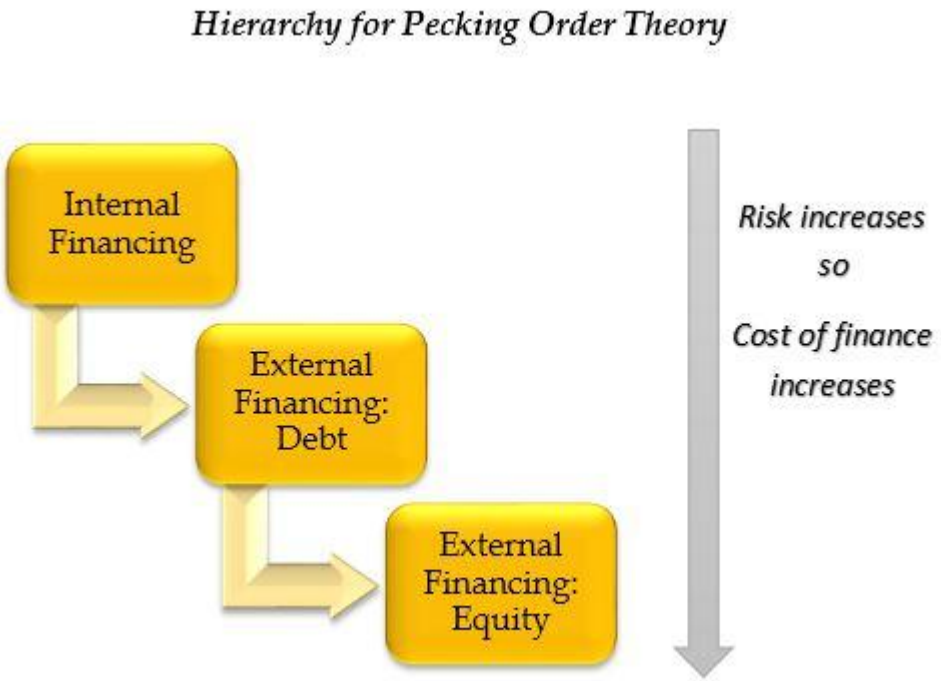



**Fig 9.6 Hierarchy of Pecking Order Theory**

**Source:** (https://efinancemanagement.com/financial-leverage/pecking-order-theory)

This order of preference is generally preferred because the internally generated funds have no issue cost and cost of equity issue is the highest. The theory presumes that;

i. The cost of using internally raised funds are minimum because they have no issue cost.
ii. Raising of debt is cheaper source of finance than the equity issue.
iii. Issue of new equity share involves heavy issue cost.
iv. Servicing of debt capital is relatively less as compared to servicing of equity capital.

The pecking order theory proposes that:

a) Firm's dividend policy decision depends upon its leverage position and investment decision.

b) Internally generated funds should be preferred than external financing.
c) If external financing is needed than debt should be preferred to equity.
d) Issue of new equity for raising additional funds is considered as a last resort.

According to the Modified Pecking order theory, as suggested by Myers in 1984, the order of raising finance arises because of the existence of asymmetric information between the market and the company. Asymmetric information is the unequal distribution of the information. The managers generally have more information about the true value of company's existing assets than the shareholders. Also managers know more about the true value of the company's potential investment project. So generally higher the asymmetry of information, higher is the risk in the company. Also, it is not possible for the shareholders to know everything about a company. So, there will always be some amount of information asymmetry in every company. If a creditor or an investor has less information about the company, he/she will claim higher returns against the risk taken. Along with providing higher returns, the company will have to incur costs to issue the debt and equity. So all these reasons make retained earnings a cheaper and convenient source of finance than external sources (debt and equity).

**Signals from the choice of financing**

Company decision to choose source of financing sends some signal in the market. If the company is financing itself through the retained earnings or internal financing it considered to be strong signal. It shows that company has enough funds to take care of its funding requirements. If firm raise funds through the debt issue then it is considered that management is confident enough that it will be able to meet its fixed expenses (interest payments). If the company finances itself through the equity issue then it is the negative signal. Equity issues are interpreted as a bad news, since company is motivated to make issue when the stock is overpriced. So all these logics are applied to develop the hierarchy of pecking order theory. This hierarchy should be followed while constructed the capital structure of the company.

**Miscellaneous Illustrations**

**Illustration -7**

Firm A has issued 12% of debentures of Rs.15 lakhs while B has issued only equity. Both the firms earn 30% before interest and taxes on their total assets of Rs. 25 lakhs. Assuming a tax rate of 50% and capitalization rate of 20% for an all-equity company, you are required to compute the value of two firms using 1) Net Income Approach, and 2) Net Operating Income Approach.

**Solution;**

Computation of total value of firms

1.

| Net Income Approach | Levered Firm A | Unlevered Firm B |
|---|---|---|
| EBIT, 30% on Rs.25,00,000 | 7,50,000 | 7,50,000 |
| Less; Interest on debentures | 1,80,000 | - |
| | 5,70,000 | 7,50,000 |
| Less: Tax at 50% | 2,85,000 | 3,75,000 |
| | | 3,75,000 |
| Earnings available for equity shareholders | 2,85,000 | |
| Capitalized value of equity at 20% | | - |
| Firm A : 2,85,000 $\times\frac{100}{20}$ | 14,25,000 | 18,75,000 |
| | | - |
| Firm B : 3,75,000 $\times\frac{100}{20}$ | - | 18,75,000 |
| Add: value of debt | 15,00,000 | |
| Total value of firm | 29,25,000 | |

2. Net Operating Income Approach;

Value of Unlevered Firm B (Vu) = $\frac{\text{EBIT (1-t)}}{\text{Ke}}$

$= \frac{7,\ 50,000\ (1-.5)}{20\%}$

= Rs. 18, 75,000

Value of Levered Firm A($V_L$) = V + t d

= 18, 75,000 + .5× 15, 00,000

= 18, 75,000 + 750,000

= Rs. 26, 25,000

**Illustration -8**

**Levered Firm (L)**

Value of levered firm = Rs. 1, 10,000

Equity = Rs.60, 000, Debt = Rs. 50,000

$K_d$ = 5%, EBIT = Rs. 20,000

Investor holds 10% share capital

**Unlevered Firm (U)**

Value of un-levered firm = Rs. 1, 00,000

EBIT = Rs. 20,000

Investors hold 10% share capital

You are required to explain how under M&M approach, an investor holding 10% of shares in levered company will be better off in switching his holding to unlevered company.

**Solution;**

| | |
|---|---|
| EBIT (L) | = 20,000 |
| Less: Interest ($50000\times\frac{5}{100}$) | = 2,500 |
| Profit after tax | = 17,500 |
| Share of investor $17,500\times\frac{10}{100}$ | = 1750 |

**Alternate Strategy**

Sell share in levered company: 10% of 60,000 = 6000

Borrow (personal leverage) 10% of 50,000 = 5000

Total cash available = 11,000

Buy shares in (U) company

10% of 1, 00,000 = 10,000

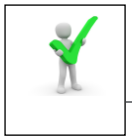
Return 10% of 20,000 = 2000

Less: interest on loan borrowed 5% of 5000 = 250

Net return available = 1750

Cash available 11000-10000 =1000

In the above situation if investor switches towards to the U company his return will remain the same and additional cash available to him is Rs. 1000.



***Check Your Progress- B***

**Q1. Write a note on Pecking order theory of capital structure.**

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**Q2. What do you understand by capital gearing?**

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**Q3. What do you understand by 'high gear' and 'low gear'?**

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**Q4. How do bankruptcy costs affect the company's capital structure?**

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**Q5. What is 'Agency cost of Debt'?**

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**Q6. What are principal- agent problem?**

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## 9.7 SUMMARY

Capital structure is defined as the way a company finances its operation through the combination of equity, debt or hybrid security. The importance of capital structure cannot be ignored as, any firm may it be small, medium or large firm. Different theories are discussed above stated the proportion of debt and equity mix used to attain the optimum capital structure. Optimum capital structure is the best mix of debt and equity financing that maximizes the company's share price and minimizes the cost. Debts are considered to be the cheaper source of finance than equity and use of debts reduce WACC. But companies need to avoid the situations of too little debt (where WACC can be decrease further) or too much use of debt (where companies suffer from bankruptcy cost, agency cost and tax exhaustion). Companies should be sensible enough while choosing the level of debt-equity mix. Companies should also be aware of Pecking Order Theory which totally ignores the search of an optimal capital structure. As per this theory, when company wants to raise finance it does so by using its retained earnings then debt financing and equity finance as a last resort.

## 9.8 GLOSSARY

**Bankruptcy:** A state in which a firm (or individual) is unable to meet its obligations and hence, its assets are surrendered to a court for administration.

**Business Risk**: The basic risks of company's operations

**Capital Structure**: The combination or weighting of different debts and equities used to finance a corporation.

**EBIT:** Abbreviation for earnings before interest and taxes.

**Financial management**: Financial management is the part of management activity which is concerned with the planning and controlling of firm's financial resources.

**Financial Risk**: the risk that arises when cash flow of an issuer will not be adequate to meet its financial obligations.

**Financial Leverage**: Amount of debt used in the capital structure of the company.

## 9.9 REFERENCES


- Prasanna Chandra (2003). Financial Management, theory and practice: Tata Mcgraw Hill
- I M Pandey (2005).Financial Management: Vikas Publishing House.
- M.Y Khan, P.K Jain (2013). Financial Management, Text Problem cases: Tata McGraw Hill.
- https://efinancemanagement.com/financial-leverage/pecking-order-theory
- https://www.accaglobal.com/in/en/student/exam-support-resources/fundamentals-exams-study-resources/f9/technical-articles/optimum-capital-structure.html
- https://www.wallstreetmojo.com/capital-gearing-ratio/
- http://shodhganga.inflibnet.ac.in/bitstream/10603/5253/10/11_chapter%203.pdf
- https://efinancemanagement.com/financial-leverage/capital-structure-theory-traditional- approach


## 9.10 SUGGESTED READINGS


1. "Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
2. "Gopalakrishnan", Project Management, TMH, 2007.
3. "H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.
4. "Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.
5. "Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.
6. "Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.
7. "Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.
8. "Prasanna Chandra", Project Management, TMH,2007.
9. "Chowdry", Project Management, TMH,2007.
10. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition
11. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.

12. Financial Management: I.M. Pandey.

13. Financial Management: Theory and Practices- Prasanna Chandra.

14. Financial Management: Khan and Jain.

## 9.11 TERMINAL AND MODEL QUESTIONS

Q1. Give a critical appraisal of the traditional approach and the Modigliani- Millers approach to the problem of capital structure.

Q2. What do you understand by capital gearing? What is its significance?

Q3. Discuss the effects of high and low gearing on the financial position of company during various phases of trade cycle.

# UNIT 10 EBIT-EPS ANALYSIS AND LEVERAGE



## 10.1 INTRODUCTION

In the previous unit you learnt about various theories of capital structure that provides basis for relevance and irrelevance of optimum capital structure. We also learnt that existence of optimum capital structure is not well taken by all and there exist extreme views towards identifying optimum debt-equity mix for a company. However, undoubtedly, the capital structure decision is very essential for a company as it affects owner's risk and return.

In this unit, you will learn about how much debt should be employed in company to have a rational capital structure. Finance manger should craft capital structure in a way that balances the incremental returns with regard to the employment of debt in the capital structure as well as risk to the equity shareholders. In this unit we will discuss as to how leverages affect EBIT and EPS and that further impact shareholders returns and risk in the company.

However, somewhere final decision also rest on the various implicit and explicit factors and hence these decisions also attract some extent of subjectivity on the part of owners and managers of the company.

## 10.2 OBJECTIVES

After reading this unit you will be able to:

- Understand the EBIT-EPS Analysis
- Know about the concept and importance of leverages.
- Differentiate between operating and financial leverages.
- Compute different types of leverages.

## 10.3 EBIT-EPS ANALYSIS

EBIT-EPS Analysis is the method for determining optimum capital structure for a company at a given point of time where Earning per Share is the highest for a given amount of Profit before Interest and Taxes. The main idea behind computation of EBIT-EPS Analysis is to determine the impact of different sources of financing patterns on EPS. EBIT-EPS Analysis provide foundation for deciding appropriate capital structure that yields highest returns over the company's expected level of EBIT. EPS is the standard or benchmark for the evaluating the overall financial performance of a company or a firm. It helps in making comparison among different financial plans. It is financial planning tool that intends to decide the right proportion of debt and equity in the capital structure of a firm. Thus, EBIT-EPS Analysis tries to assess various alternatives to the financing of a capital. The graph shows EPS as varying levels of debt and equity; say 20 percent debt and 80 percent equity else 30 percent debt and 70 percent equity. The graph so plotted on the basis of EPS as a data point for each level of EBIT at various debt-equity combinations is analyzed to find the optimal capital structure framework for the company.

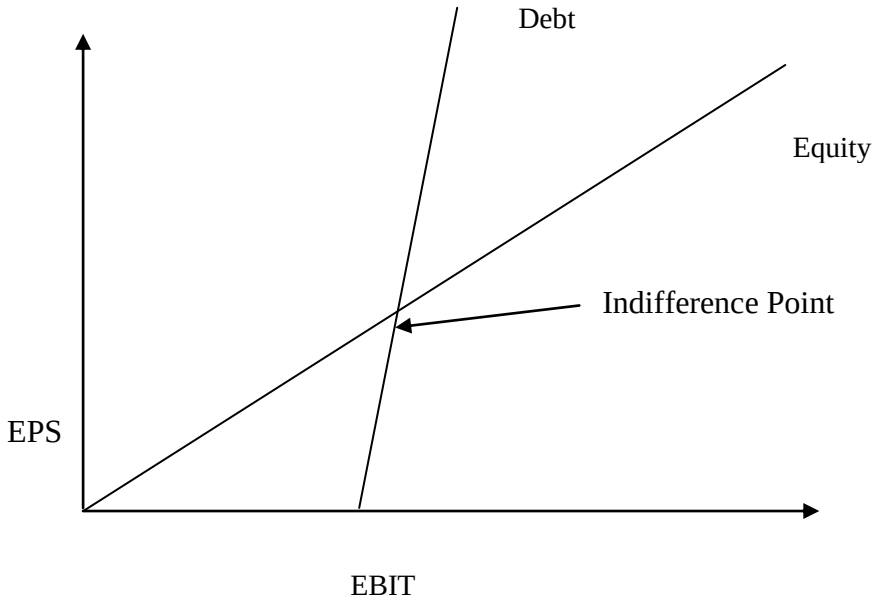



**Fig 10.1 Indifference point**

The Indifference Point or EBIT-EPS Break Even Point indicates the point at which EPS is same irrespective of any level of financial leverage. This means that at the indifference point rate of return on the capital employed is same as the rate of interest on the debt. In other words, it is the EBIT level at which Earnings per Share for the alternatives are same. This is sometimes also called as Break-Even of EBIT for alternative financial plans. In other words, when two or more than two alternative financial plans results into the level of EBIT where EPS is the same, this point is termed as Indifference Point. When level of EBIT crosses this Indifference point, then debt financing is fruitful for the company as in such a case Earning per Share shall be maximized due to debt usage in the capital structure. Thus, it may be inferred that at this point even the management of the company shall be indifferent in opting for an alternative debt equity combinations as all the debt equity plans are equally attractive.

The Indifference Point can be calculated using the following formula;

$$\frac{(EBIT-INT_1)(1-T)-PD}{N_1} = \frac{(EBIT-INT_2)(1-T)-PD}{N_2}$$

$$EPS\ (Financing\ Plan\ 1) = EPS\ (Financing\ Plan\ 2)$$

EBIT= Earnings before Interest and Taxes

$I_1$=Interest under alternative 1

$I_2$=Interest under alternative 2

$T =$ Tax Rate

PD = Preference Dividend

$N_1$=Number of Equity Shares ( or amount of equity share capital) under first alternative.

$N_2$=Number of Equity Shares ( or amount of equity share capital) under second alternative.

The above formula can also be written as;

$$EBIT = \frac{N_1}{N_{1-}\ N_2} \times \frac{PD}{1-T}$$

To find out the break- even level of EBIT at which EPS would same for all equity plan and for debt equity plan would be as follows (assuming non existence of preference shares);

$$\text{EPS ( All equity Plan 1)} = \text{EPS (Debt} - \text{Equity Plan 2)}$$

$$\frac{(EBIT)(1-T)}{N_1} = \frac{(EBIT-INT)(1-T)}{N_2}$$

$$EBIT = \frac{N_1}{N_{1-}\ N_2} \times INT$$

Let us learn the computation of Indifference point from the following illustrations;

**Illustration -1**

Sun Chemicals Limited plans for an expansion project. To meet the requirements of expansion Programme Company requires Rs. 20, 00,000. The corporate tax rate prevailing in the economy is 30%. For raising additional funds, company have the following alternative sources to raise the funds;

a) Equity Share Capital of Rs 20, 00,000 (Face Value of Rs100) or 15% debentures of Rs 10, 00,000 and Equity Share Capital of Rs 10, 00,000 (Face Value of Rs100).
b) Equity Shares of Rs 20, 00,000 (Face Value of Rs100) or 12% Preference Share Capital of Rs 10, 00,000 and Equity Shares Capital of Rs 10, 00,000 (Face Value of Rs100).
c) Equity Shares of Rs 20, 00,000 (Face Value of Rs100) or 12% Preference Share Capital of Rs 6, 00,000, 15% debentures of Rs 4, 00,000 and Equity Shares Capital of Rs 10, 00,000 (Face Value of Rs100).
d) Equity Shares of Rs 9, 00,000 (Face Value of Rs100) and 12% Preference Share Capital of Rs11, 00,000 or Equity Shares Capital of Rs 8, 00,000 (Face Value of Rs100), and 12% Preference Share Capital of Rs 2,00,000 and 15% debentures of Rs10, 00,000.

Calculate the indifference point for the various alternatives provided.

**Solution**

The indifference point for the various alternatives is calculated as under;

a) Equity Share Capital versus Equity Share Capital and Debentures

$$\frac{(EBIT)(1-T)}{N_1} = \frac{(EBIT-INT)(1-T)}{N_2}$$

$$EBIT = \frac{N_1}{N_1 - N_2} \times INT$$

$$= \frac{20{,}000}{20{,}000-10{,}000} \times 150000$$

$$= \frac{20{,}000}{10{,}000} \times 150000 = 2 \times 150000 = \text{Rs.}3{,}00{,}000$$

b) $$\frac{(EBIT)(1-T)}{N_1} = \frac{EBIT(1-T)}{N_2} - PDIV$$

$$EBIT = \frac{N_1}{N_1 - N_2} \times \left[\frac{PDIV}{(1-T)}\right]$$

$$= \frac{20{,}000}{20{,}000-10{,}000} \times \frac{12000}{1-.30} = \frac{20000}{10000} \times \frac{120000}{1-.30} = \text{Rs. } 8{,}00{,}000$$

c) $$EBIT = \frac{N_1}{N_1 - N_2} \times \left[INT + \frac{PDIV}{(1-T)}\right]$$

$$= \frac{9{,}000}{9{,}000-8{,}000} \times \left[150000 + \frac{120000}{1-.30}\right]$$

$$== \frac{20000}{10000} \times \frac{120000}{1-.30} = \text{Rs. } 8{,}00{,}000$$

d) $$EBIT = \frac{N_1}{N_1 - N_2} \times \left[INT + \frac{PDIV_2}{(1-T)}\right] - \left[\frac{N_2}{N_1 - N_2} \times \frac{PDIV_1}{(1-T)}\right]$$

$$= \frac{9{,}000}{9{,}000-8{,}000} \times \left[150000 + \frac{24000}{.70}\right] - \left[\frac{8000}{9000 - 8000} \times \frac{13200}{.70}\right]$$

$$= 9000 \times [150000 + 34286] - [8000 + 18857]$$

$$= 9000 \times 184286 - 266857$$

$$= 1658574000 - 266857 = 1658307143$$

**Illustration -2**

Firm ABC may face six unforeseen circumstances regarding sales of the product because of economic conditions. The EBIT is likely to be as under;

| | Very Poor | Poor | Normal | Good | Very Good |
|---|---|---|---|---|---|
| EBIT | 10000 | 30000 | 60000 | 80000 | 100000 |

The company has an option to decide its financing mix by either employing no debt, 20% debt, 30% debt or 40% debt. The company's capital structure consists of Rs 1, 00,000 equity shares of Rs 10 each. Tax rate is 30%. If the company issues debentures, then the interest rate is likely to be 10%. What are the earnings per share under each of the three financial plans? Determine the indifference point using formula and depict it graphically.

**Solution**

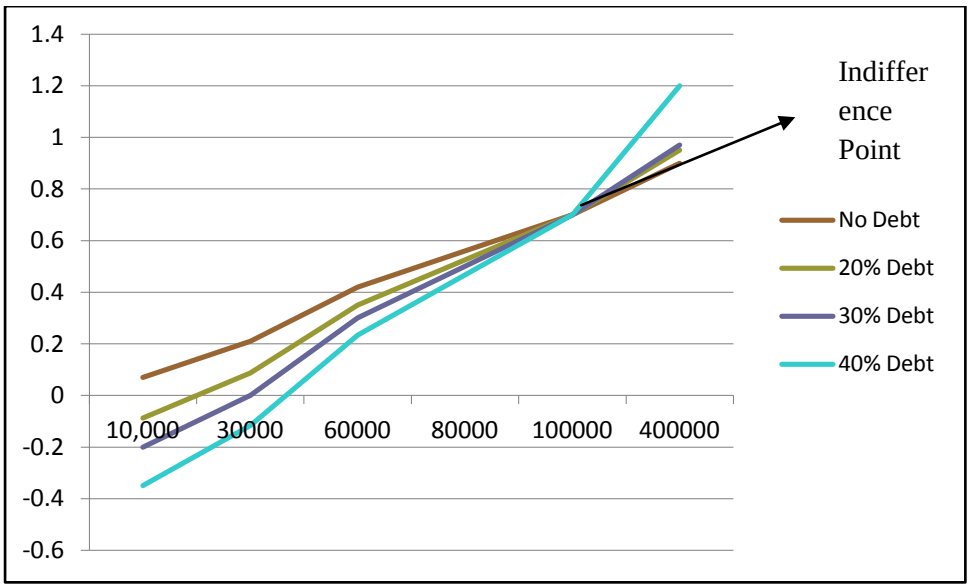
Let us calculate Earnings per share for the various alternatives. As we know that EBIT minus Interest is Earning Before Tax (EBT) and when taxes are deducted from EBT then Earning After Taxes arrives. This EAT is divided from number of shares to find Earning per Share. The above steps are followed to find under No Debt, 20% debt, 30% debt or 40% debt alternatives under different circumstances.

| **First Option** | | | | | |
|---|---|---|---|---|---|
| | Very Poor | Poor | Normal | Good | Very Good |
| **No Debt** | | | | | |
| **EBIT** | 10,000 | 30000 | 60000 | 80000 | 100000 |
| **Interest** | 0 | 0 | 0 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| **EBT** | 10,000 | 30,000 | 60,000 | 80,000 | 100,000 |
| **Tax** | 3000 | 9000 | 18000 | 24000 | 30000 |
| **EAT** | 7,000 | 21,000 | 42,000 | 56,000 | 70,000 |
| **Number of Shares** | 100000 | 100000 | 100000 | 100000 | 100000 |
| **EPS** | 0.07 | 0.21 | 0.42 | 0.56 | 0.7 |
| | | | | | |
| **Second Option** | | | | | |
| **20% Debt** | | | | | |
| **EBIT** | 10,000 | 30000 | 60000 | 80000 | 100000 |
| **Interest** | 20000 | 20000 | 20000 | 20000 | 20000 |
| **EBT** | -10,000 | 10,000 | 40,000 | 60,000 | 80,000 |
| **Tax** | -3000 | 3000 | 12000 | 18000 | 24000 |
| **EAT** | -7,000 | 7,000 | 28,000 | 42,000 | 56,000 |
| **Number of Shares** | 80000 | 80000 | 80000 | 80000 | 80000 |
| **EPS** | -0.0875 | 0.0875 | 0.35 | 0.525 | 0.7 |
| | | | | | |
| **Third Option** | | | | | |
| **30% Debt** | | | | | |
| **EBIT** | 10,000 | 30000 | 60000 | 80000 | 100000 |
| **Interest** | 30000 | 30000 | 30000 | 30000 | 30000 |
| **EBT** | -20,000 | 0 | 30,000 | 50,000 | 70,000 |
| **Tax** | -6000 | 0 | 9000 | 15000 | 21000 |
| **EAT** | -14,000 | 0 | 21,000 | 35,000 | 49,000 |
| **Number of Shares** | 70000 | 70000 | 70000 | 70000 | 70000 |
| **EPS** | -0.2 | 0 | 0.3 | 0.5 | 0.7 |
| | | | | | |
| | | | | | |
| **Fourth Option** | | | | | |
| **40% Debt** | | | | | |
| **EBIT** | 10,000 | 30000 | 60000 | 80000 | 100000 |
| **Interest** | 40000 | 40000 | 40000 | 40000 | 40000 |

| | | | | | |
|---|---|---|---|---|---|
| **EBT** | -30,000 | -10,000 | 20,000 | 40,000 | 60,000 |
| **Tax** | -9000 | -3000 | 6000 | 12000 | 18000 |
| **EAT** | -21,000 | -7,000 | 14,000 | 28,000 | 42,000 |
| **Number of Shares** | 60000 | 60000 | 60000 | 60000 | 60000 |
| **EPS** | -0.35 | -0.11667 | 0.233333 | 0.466667 | 0.7 |

EPS




**EBIT**

Now indifference point for the above hypothetical example is;

**Indifference Point between First and Second Alternative is;**

$$EBIT = \frac{N_1}{N_{1-}\ N_2} \times INT$$

$$= \frac{\mathbf{1,00,000}}{\mathbf{100000-80000}} \times 20000$$

=1,00,000

**Indifference Point between First and Third Alternative is;**

$$EBIT = \frac{N_1}{N_{1-}\ N_2} \times INT$$

$$\frac{1{,}00{,}000}{100000 - 70000} \times 30000$$

=1,00,000

**Indifference Point between First and Fourth Alternative is;**

$$EBIT = \frac{N_1}{N_{1-}\ N_2} \times INT$$

$$\frac{1{,}00{,}000}{100000 - 60000} \times 40000$$

=1,00,000

So , indifference point is at the EBIT level of 1,00,000 under different combinations. We can also infer from the table that when the economic conditions are very good then the use of debt in the capital structure increase EPS whereas when company is using 40% debt in the very poor economic conditions then Earning per share is -0.35. This means that use of debt is reducing shareholder's wealth when there is depression in the market. However in such circumstances, non employment of debt in the capital structure results into positive Earnings per share i.e., 0.07, hence in these situations amount invested by the shareholders is protected.

***Check Your Progress-A***

**Q1. What do you mean by Indifference Point?**

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**Q2. Why a company is interested to conduct EBIT-EPS Analysis?**

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**Q3. Write the formula for calculating indifference point.**

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# 10.4 INTRODUCTION TO LEVERAGE

*"Give me a lever and a place to stand and I will move the earth. Give me a fulcrum, and I shall move the world. Give me a firm spot on which to stand, and I shall move the earth". Archimedes*

The basic concept of leverage is conceptually to examine the risk resulting due to inclusion of debt in the capital structure. Therefore, leverage helps in estimating the risks of debt financing. A lever is a simple machine which is made up of a beam or stiff rod rotating at a set hinge or fulcrum. A lever is a rigid body that can rotate on itself at a stage. Lever is one of the significant components of the machine tool that is an essential component of the power transmission system. It helps in lifting heavy objects with little utilization of force or power. Accordingly, leverage generally means influence of force in elevating or attaining something. In Financial Management, leverage means influence of independent financial variable over the dependent financial variable. Therefore, it measure influence of independent variable on the dependent variable. Therefore it is how changes in the percentage of independent financial variable will impact the percentage change in dependent variable. Let us read the following description given by Horne and Wachowicz

"When a lever is used properly, a force applied at one point is transformed, or magnified into another, larger force or motion at some other point. This comes most readily to mind when considering mechanical leverages, such as that which occurs when using a crowbar. In a business context, however, leverage refers to the use of fixed costs in an attempt to increase or lever up) profitability". Horne and Wachowicz

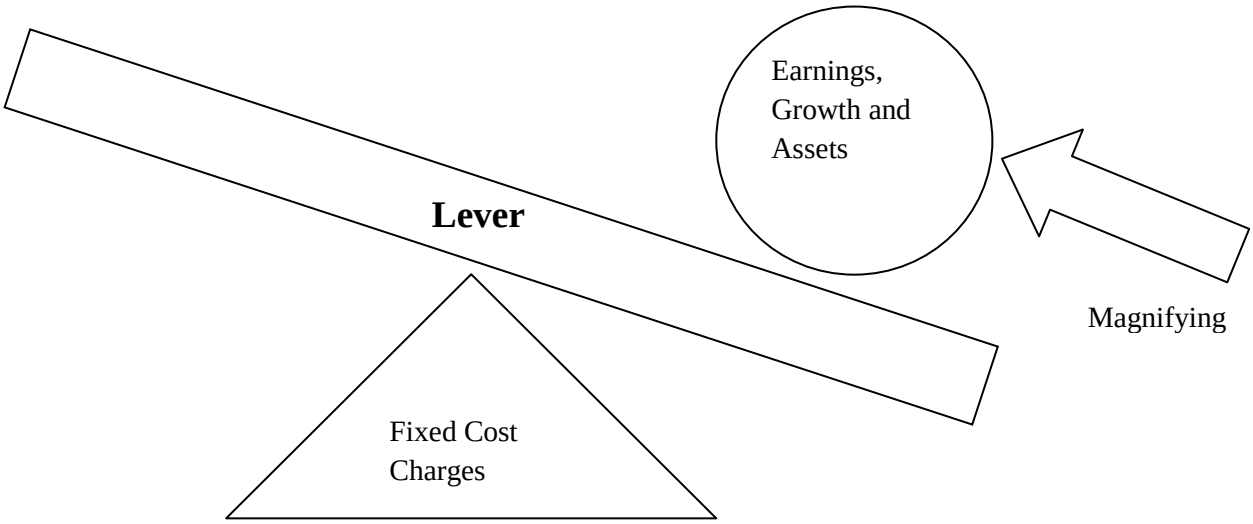



**Fig 10.2 Leverage**

So , we inferred that the term 'leverage' refers to "means of accomplishing power for gaining advantage". Therefore, it tries to explore the effect of one financial variable on the other financial variable.

The leverage are generally classified into three main categories, these are;

a) Financial Leverage
b) Operating Leverage
c) Combined Leverage

## 10.5 SIGNIFICANCE OF LEVERAGES

Leverages are basically quantitative tools for assessing the returns to the owners. The same shall be inferred using earning per share and the market price per share. The most often used leverage by the financial analysts is financial leverage as it focuses primarily on market price of the shares and hence net worth of the firm. Therefore, the managers as well as policy makers assess the position of trading on equity as when there is increment in EBIT then there shall also be corresponding increase in price of equity shares. Leverage impacts the company's level and variability in after tax income and thus impact general risk and return of the company.

Leverages are an important instrument that the management of a company can use to create the best choices about funding and investment. It offers a range of funding sources through which the company can attain its target earnings. Leverages specially financial and operating leverage have enormous acceleration and deceleration effect on Earnings before Interest and Taxes as well as on EPS therefore, it is important for the company to manage leverage appropriately. When the company becomes more financially leveraged by employing debt funds that the company become more prone to risk as increased use of debt financing will lead to high financial risk that will bring about increased fluctuations in the returns on equity and increase in the interest rate on debts.

Leverages are double-edged sword and therefore an appropriate combination of operating and financial leverage may act as boon for the growth and the success for the company and on the contrary, in some circumstances it can serve as a curse in the rapid growth and survival of a company. It is generally noticed that company having high operating leverage should not have high financial leverage and accordingly, company having low operating leverage will magnify its profits and returns by adopting strategy of high financial leverage provided that if it has sufficient lucrative possibilities to use borrowed funds. Firm having high degree of financial and operating leverage has to the face the problems of illiquidity and insolvency. A high degree of operating leverage with high financial leverage will lead to riskier financial position as it may be inferred that company is employing excessive assets on which it is paying high fixed cost together with large amount of debt funds. Thus, these fixed cost charges and fixed interest payments will attract greater risk to the firm. In case there is a fluctuation in the earnings or returns then the company will face tremendous problems in meeting its fixed cost. Reasons for such fluctuations in earnings may also accrue due to existence of high operating leverage. The presence of such a high degree of operating leverage will lead to more than proportionate change in the EPS even with a small change in the level of EBIT.

Therefore, generally low operating leverage and high financial leverage is considered to be an ideal situation for maximising profits with minimum of risk. Further, having low level of leverages shows conservative approach of the management and therefore it will result into loss of profit earning opportunities. Hence, Operating Leverage and Financial Leverage can be mixed to achieve a desirable level of corporate growth such as increases in sales, increases in profits and increases in assets in a number of distinct ways.

## 10.6 OPERATING LEVERAGE

Operating Leverage directly impact operating profit of company that is it impact EBIT whereas Financial Leverage affects Profit after tax or Earning per Share. Therefore,

Operating Leverage is related with the operations of a firm. Operating Leverage arises due to inclusion of fixed nature of costs in the cost structure. Therefore, operating leverage relates to the changes in sales and profit. Therefore, slight changes in sales results into drastic impact on profitability.

Operating Leverage $= \frac{Contribution}{EBIT}$ or $\frac{Contribution}{Operating\ Profit}$

"Operating Leverage is the responsiveness of firm's EBIT to the changes in sales value. It refers to the sensitivity of operating profit before interest and tax to the changes in quantity produced and sold".(Kishore Ravi)

Operating leverage of a firm is high when its fixed costs is high and the variable costs is less and it will have lower operating leverage when it uses greater amount of variable costs and less amount of fixed costs. Therefore, in case of existence of operating leverage in a firm, 1% change in sales results into more than 1% change in EBIT then it may be inferred that there is presence of operating leverage and this change is measured by Degree of Operating Leverage. Degree of Operating Leverage shall be defined as percentage change in the profits resulting from percentage change in sales.

Degree of Operating Leverage = $\frac{\Delta\ EBIT}{\Delta Q}$ or $\frac{Percentage\ Change\ in\ EBIT}{Percentage\ Change\ in\ Sales}$ or $\frac{Contribution}{Operating\ Profit}$ or $\frac{Contribution}{EBIT}$

The Degree of Operating Leverage can also be computed using the following formula ;

Degree of Operating Leverage = $\frac{Q(SP-VC)}{Q(SP-VC)-FC}$

Q= Quantity Produced

SP=Selling price per unit

VC=Variable cost per Unit

FC=Fixed Costs

The degree of operating leverage calculates the responsiveness of EBIT with respect to the change in the level of quantity produced or sold. The presence of fixed operating expenses gives a firm operating leverage that magnifies the operating profit of a firm. However, operating leverage may lead to increase or decrease the operating profit. Accordingly, operating leverage may be favourable or unfavourable. If the contribution is greater than the fixed cost, then the operating leverage is favourable. On the contrary, if sales minus variable cost i.e. contribution is less than the fixed cost then the operating leverage is generally assessed as unfavourable. Generally speaking, companies do not like to function under high operating leverage circumstances. Operating leverage reflects the effect on operating income

of changes in sales. If a company has a high degree of operating leverage, then slight variations in sales will have a major impact on operating income. Accordingly, the operating profits (EBIT) of such a firm increase at a greater rate as compared to the increase in sales. Further, a small drop in sales can excessively damage the firm's operating profit.

**Illustration -3**

The PVC pipe manufacturer company is assumed to have a sales volume of 2000 units at a selling price of Rs 100, its variable cost per unit is Rs 20 and fixed cost is Rs 1, 00,000. You are required to calculate its operating leverage.

**Solution**

The operating leverage of the above company shall be;

$$=\frac{2000(100-20)}{2000(100-20)-1,00,000}$$

$$=\frac{160000}{160000-100000}=2.67$$

If the sales volume increases to 4,000 then the operating leverage shall be;

$$\frac{4000(100-20)}{4000(100-20)-1,00,000}=\frac{320000}{320000-100000}=1.45$$

Therefore, the operating leverage would change with the changes in the sales volume, variable cost and fixed cost. Therefore, for attaining favourable operating leverage, fixed and variable cost should to be monitored along with value and volume of sales.

# 10.7 FINANCIAL LEVERAGE

The use of fixed-charges sources of funds in form of as debt and preference capital along with the equity share capital give rise to financial leverage. Financial leverage indicates the impact on earnings or returns due to the usage of fixed cost funds in the capital structure. It represents the relationship between the company's earnings before interest and taxes (EBIT) and the earnings available to equity shareholders in form of Earnings per Share. Operating leverage indicates changes in EBIT of a firm due to changes in output. On the other hand, financial leverage measures the changes that may happen in the taxable income as a result of changes in operating income. The notion behind calculating financial leverage is to compute the changes in the return to the shareholders due to the use of debt funds. It involves the use of funds obtained at a fixed cost in the expectations of increasing the return to the shareholders.

When debt funds have greater weightage in capital structure as compared to owner's equity then leverage is said to be larger and *vice-versa.*

Financial leverage is defined as "the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the Earnings per Share". (Khan and Jain)

"The use of fixed charges sources of funds, such as debt and preference share capital along with owner' equity in the capital structure is described as financial leverage or gearing or trading on equity. " (I.M. Pandey)

"Financial leverage indicates the effect on earnings under conditions where the capitalization is not altered, created by the use of fixed charge securities in the capitalization of a company. It can be measured by the ratio of;

a) The rate of growth in earnings available to the ordinary shareholders to
b) the rate of growth of EBIT". (S.C. Kuchhal)

According to Gitmar, "Financial leverage is the ability of a firm to use fixed financial changes to magnify the effects of change in EBIT and EPS".

Financial leverage is calculated using the following formula;

$$=\frac{Operating\ Profit}{Profit\ Before\ Taxes} \text{ or } \frac{EBIT}{EBT}$$

The higher ratio indicates that the company may face strain in paying interest on borrowings whereas if the ratio is lower, it indicates less interest payments on the account of lower borrowings but in such a case company might have forgone the opportunities of utilizing interest tax shield for magnifying the returns to the shareholders. Financial leverage is one of the key instruments used to find the ratio between the percentage of fixed costs with respect to the total capital of a firm or a company. Further, if a firm raise debt funds at higher price than the income that will accrue from such investments including earning per share tend to decline.

Accordingly, financial leverage may be favorable or positive when company utilizes funds raised at a fixed cost to earn more than the fixed financing cost whereas it is unfavorable or negative when company does not earn greater than the amount to be paid towards fixed interest payments on debt funds i.e. firm is not able to earn sufficient profits to cover financing costs. The leverage will be regarded favorable as long as the company earns more than the fixed costs of its use on the assets so purchased with the funds. Higher financial leverage shall contribute in increasing EBIT that will ultimately contribute in magnifying earnings per share, if other variables remain the same. Financial leverage impacts variability and expected level of EPS. With the increase in debt in the capital structure, the EBIT of the firm will increase (due to interest tax shield) resulting into higher EPS. However, higher financial leverage will also attract riskiness to the firm, therefore after a certain level, additional use of debt would drastically curtail the returns available to the equity shareholders and accordingly, their earning per share will also fall. The same has been represented as under;

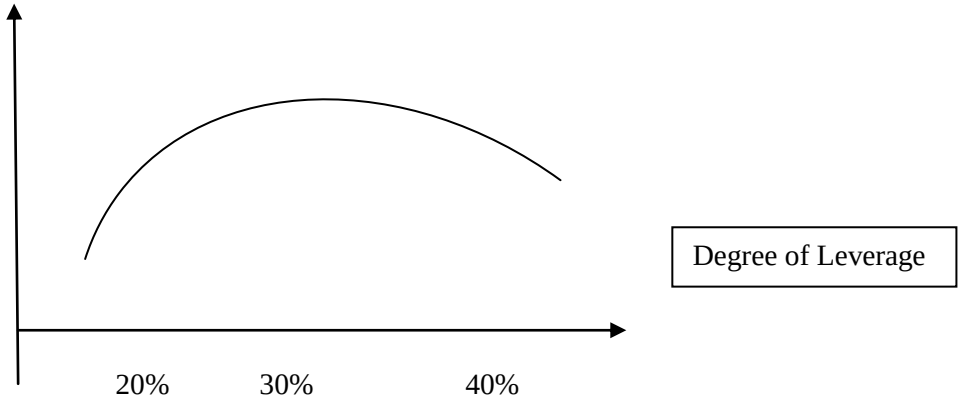



**Fig 10.3 Degree of leverage**

## 10.7.1 TRADING ON EQUITY OR CAPITAL GEARING

The use of fixed interest paying securities such as debt or preference share capital in the capital structure is termed as Financial Leverage or Gearing or Trading on Equity. Trading on Equity means the equity is traded upon to raise debt. That means the financial leverage is employed to earn more returns on the fixed interest bearing funds than the cost of raising it. However, the debt funds providers will expect continuous stream of earnings and protection in values as they has limited participation in the company's profit.

A company raises debt at low cost for earnings of the equity shareholders. The cost of debt is lower due to tax advantage. The rate of return on the Owners Equity is levered above or below the rate of return on total assets.

Financial leverage does magnify the earnings available for equity shareholders but it also creates risk of losing returns. Therefore, at times, financial leverage is termed as double edged sword with two cutting edges that means financial leverage implies that debt has its potential advantages as well as disadvantages. Financial leverage can increase profits as well as can decrease it.

In general, the financial leverage and the weighted average cost of capital shares inverse relationships that when there is an increase in financial leverage then the weighted average cost of capital will decline and on the contrary, when there is decrease in financial leverage, weighted average cost of capital would increase. Moreover, financial leverage shares direct relationship with the value of firm. The value of firm increases with the increase in financial leverage and *vice versa.*

| Financial Leverage | Weighted Average cost of capital | Market price of equity shares and value of the firm |
|---|---|---|
| Increase | Decline | Increase |
| Decrease | Increase | Decline |

Degree of Financial Leverage is defined as the percentage change in EPS as result of percentage change in operating profit. It therefore depicts the relationship between taxable income (percentage changes) and operating income (percentage changes). Financial Leverage is said to be existent when resultant digit/s from the above is greater than one.

According to Horne and Wachowicz "Degree of Financial leverage is the quantitative measure of the sensitivity of a firm's earning per share to a change in the firm's operating profit".

According to Ravi M. Kishore "Degree of Financial Leverage measures the responsiveness of EPS to the changes in EBIT".

Degree of Financial Leverage = $\frac{\Delta\, EPS}{\Delta EBIT}$ or $\frac{Percenatge\ Change\ in\ EPS}{Percenatge\ Change\ in\ EBIT}$ or $\frac{Percenatge\ Change\ in\ EPS}{Percenatge\ Change\ in\ Operating\ Profit}$ or $\frac{\Delta\, EPS/\ EPS}{\Delta EBIT/EBIT}$

The Degree of Financial Leverage can also be computed using the following formula ;

Degree of Financial Leverage = $\frac{EBIT}{EBIT - I - \frac{D_p}{(1-t)}}$

EBIT= Earnings before Interest and Taxes

$D_p$= Preference Dividend

I= Interest on long term debt funds

t=Income Tax rate

**Illustration -4**

Management of Sunshine Ltd. is thinking about three financial alternatives. As a finance manager, you are required to calculate and interpret the financial leverage for the each alternative.

| | I | II | III |
|---|---|---|---|
| Equity Capital | 400000 | 100000 | 300000 |
| Debt | 200000 | 500000 | 700000 |
| Operating Profit | 100000 | 100000 | 100000 |

**Solution**

The financial leverage for the three alternatives is provided as under;

| | I | II | III |
|---|---|---|---|
| Operating Profit | 100000 | 100000 | 100000 |
| Interest (10% on Debt) | 20000 | 50000 | 70000 |
| Profit before Tax(PBT) | 80000 | 50000 | 30000 |
| Financial Leverage = Operating Profit/PBT | 1.25 | 2 | 3.33 |

From the above example it can be inferred that as we increase Debt from 200000 to 500000, financial leverage too increases from 1.25 to 2. In the above case, if we further increase debt keeping the same operating profit, financial leverage also increases to 3.33. However, if operating profit decreases to Rs 70,000 in the third plan then its impact on taxable income will be as follows;

| | |
|---|---|
| Operating Profit | 70000 |
| Interest (10% on Debt) | 70000 |
| Profit before Tax(PBT) | 0 |
| Financial Leverage = Operating Profit/PBT | NIL |

Thus, it means that every 1% percent change in operating profit will result in 3.33% change in the taxable profit. However, if the operating profit is decreased to 70,000 then as a result the taxable profit also decreased from 30,000 to 0 and therefore making financial leverage as 0.

**Illustration -5**

The following information is available for ABC Corporation Ltd. for the year ended 31st March, 2018;

Interest on Debentures Rs 5, 00,000

Preference Dividend Rs 1, 00,000

Corporate Tax Rate 30%

EBIT 8, 00,000

Calculate the degree of financial leverage.

Degree of Financial Leverage $=\frac{EBIT}{EBIT-I-\frac{Pref\ Dividend}{(1-t)}}$

$$=\frac{8,00,000}{8,00,000-5,00,000-\frac{1,00,000}{(1-.30)}}$$

$$=\frac{8,00,000}{157143}=5.09$$

Now after learning the importance of leverages, let us calculate the impact of increase in debt on the value of the firm.

Excel Ltd. wants to raise additional funds for the company. Mr. Bharat, a finance manager estimates sales of the company to be Rs 20,000. He wants to know the resultant impact of increase in Debt Percentage on Net Income, Earnings per Share and Value of the Firm. The firm is in the 30% tax bracket. Each share has a face value of Rs 10. The following details are provided below. Let us also assess whether alternative debt level effect the earning per share and value of the firm

| | | |
|---|---|---|
| **Particulars** | **Amount** | **Amount** |
| **Debt %** | **0.2** | **0.4** |
| **Interest Rate on Debt** | **0.1** | **0.1** |
| **Sales** | **20000** | **20000** |
| **Variable Cost Ratio** | **0.25** | **0.25** |
| **Income Tax Rate** | **0.3** | **0.3** |
| **Sales Growth Rate** | **0** | **0** |
| | | |
| | | |
| **Particulars** | **Amount** | **Amount** |
| **Fixed Costs** | **8000** | **8000** |
| | | |
| | | |
| **Cash** | **400** | **400** |
| **Receivables** | **1500** | **1500** |
| **Inventories** | **1500** | **1500** |
| **Plant (Net)** | **4000** | **4000** |
| **Equipment (Net)** | **5000** | **5000** |
| **Total Assets** | **12400** | **12400** |
| | | |
| **Total Liabilities** | **2480** | **4960** |
| **Stock (Rs 10)** | **9920** | **7440** |
| **Tot. Liabilities/Equity** | **12400** | **12400** |
| **Now, let us calculate EPS and Value of the Firm step- by –step procedure;** | | |
| | | |
| **Sales** | **20000** | **20000** |

| | | |
|---|---|---|
| **Fixed Costs** | **8000** | **8000** |
| **Variable Costs % Sales** | **5000** | **5000** |
| **Total Costs** | **13000** | **13000** |
| **Earnings Before Interest and Taxes** | **7000** | **7000** |
| **Less: Interest** | **248** | **496** |
| **Earnings Before Taxes** | **6752** | **6504** |
| **Less: Income Taxes** | **2025.6** | **1951.2** |
| **Net Income** | **4726.4** | **4552.8** |
| | | |
| **EPS** | **4.76451613** | **6.11935484** |
| **ROE** | **0.47645161** | **0.61193548** |
| **ROA** | **0.38116129** | **0.36716129** |
| **WACC** | **0.11** | **0.1** |
| $V_F$ | **63636.3636** | **70000** |

Financial Leverage is the extent to which fixed income securities and preferred stock used in the capital structure of business. As a general rule, there should be an appropriate mix of owner's funds (equity) and outsider's funds (creditors) in financing the firm's assets. In the above example, we can see that as the debt proportion increases in the capital structure of the company, Value of the firm also increases due to the advantage of tax shield.

## 10.8 COMBINED LEVERAGE

Combined Leverage is the combination of Financial and Operating leverage. When operating and financial leverage is combined than the numerator and denominator so obtained depicts the effect of change in sales over change in taxable profit or Earning per share.

Vanhorne defines combined leverage or total leverage as "The use of both fixed operating and financing cost by the firm and the degree of the total leverage is " the percentage change in a firm's earning per share(EPS) resulting from a 1% change in output (sales). This is also equal to a firm's degree of operating leverage (DOL) times its degree of financial leverage DFL) at a particular level of output (sales)".

Combined Leverage is the impact on the Earning per share of the firm due to the usage of operating fixed cost as well as financial fixed costs (in terms of interest payments). In Combined Leverage, a percentage change in EBIT results more than a proportionate change in earning per share. The Combined leverage is also termed as Total leverage. Hence, combined leverage discloses the relationship between Contribution and Profit before Taxes but after interest. Overall, it tries to find out resulting percentage change in taxable income due to percentage change in sales.

Degree of Combined Leverage $= Operating\ Leverage \times Combined\ Leverage$

$= \frac{Contribution}{EBIT} \times \frac{EBIT}{EBT}$

$\frac{\Delta\ EPS/EPS}{\Delta Q/Q}$ or $\frac{Contribution}{EBT or\ PBT}$

The Degree of Combined leverage can also be computed using the following formula;

Degree of Combined Leverage (in quantity)= $\frac{Q(SP-VC)}{Q(SP-VC)-FC-INT-\frac{Pref\ Div}{1-t}}$

FC=Fixed Costs

INT=Interest Cost on Debt

t=Income Tax rate

Pref. Div=Preference Dividend

Q= Quantity Produced

SP=Selling price per unit

VC=Variable cost per Unit

**Illustration -6**

A company has sales of Rs 2, 00, 000. The variable costs are expected as 30% of the sales whereas fixed operating costs amount to Rs 30,000. The amount of interest on long term debt is Rs 50,000. You are required to calculate combined leverage. Also find the impact on combined leverage when the sales increases to Rs. 2, 50,000.

**Solution**

| **Particulars** | **Amount** |
|---|---|
| Sales | 2,00,000 |
| Less Variable Cost | 60000 |

| | |
|---|---|
| Contribution | 140000 |
| Less Fixed Operating cost | 30000 |
| EBIT | 110000 |
| Less Interest | 50000 |
| PBT | 60000 |

Therefore, Composite Leverage $=\frac{Contribution}{PBT}=\frac{140000}{60000}=2.33$

This means that with every increase of Re1 in sales, taxable income will increase by 2.33 with the given figures. Further, if sales are increased to Rs 2,50,000 then the combined leverage shall be ;

| **Particulars** | **Amount** |
|---|---|
| Sales | 250000 |
| Less Variable Cost | 75000 |
| Contribution | 175000 |
| Less Fixed Operating cost | 30000 |
| EBIT | 145000 |
| Less Interest | 50000 |
| PBT | 95000 |

Combined Leverage $=\frac{Contribution}{PBT}=\frac{175000}{95000}=1.84$

So, with increase in sales, profit before tax increased to Rs 95,000. However, combined leverage was reduced to 1.84 in the above example.

**Illustration -7**

Taking another example, suppose a toy manufacturing unit has Rs. 4, 00,000 in debentures at 5% interest. Selling price is Rs 100 per unit, variable operating costs are Rs 20 per unit and annual fixed operating costs are 1,50,000. Assume tax rate as 30%. You are required to calculate, Degree of Total leverage at 10,000 units of production and sales.

**Solution**

Degree of Combined Leverage (in quantity)= $\frac{Q(SP-VC)}{Q(SP-VC)-FC-INT-\frac{Pref\ Div}{1-t}}$

$DCL_{10,000}$=$\frac{10000(100-20)}{10000(100-20)-150000-20000}$

=$\frac{800000}{630000}$ =1.27

Therefore, when the output is 10,000 units, a one percent change in Q will result in 1.27% change in EPS. Further degree of total leverage for the above example can also be calculated as under;

= $DOL_{10,000} \times DFL_{EBIT\ Rs\ 650000}$

=$\frac{10000(100-20)}{10000(100-20)-150000} \times \frac{650000}{650000-20000}$

= 1.23 × 1.03

=1.27

The combined leverage shall help in assessing the overall impact of various types of fixed costs on the firm. High operating leverage shall be balanced against lower financial leverage. Similarly dividend payments may be reduced in case of unfavourable circumstances especially when a company utilizes equity financing while designing capital structure. A slight change in EBIT results into larger proportionate change in Earning per Share.

| *Operating Leverage* | *Financial Leverage* | *Effect/Conclusion* |
|---|---|---|
| *High* | *High* | *Very risky. High interest outflow, not commensurate with earnings* |
| *High* | *Low* | *Sales still unsatisfactory in relation to the fixed costs to be absorbed. Long term borrowing not a strain on earnings* |
| *Low* | *High* | *Ideal Situation for profit maximisation* |
| *Low* | *Low* | *Management over cautious* |

(Reference: Kishore Ravi, Financial Management, 7th Edition, Taxmann Publications (P) Ltd.)

# 10.9 BROAD INFERENCES FROM THE LEVERAGES

**Financial Risk**

Financial risk basically includes the risk of possible insolvency and the added fluctuations in the earnings per share that is caused by the use of financial leverage. This happens because when a firm increases debt in the capital structure cash flows also increases in form of interest payments and this may leads to cash crunch for a company. As a result, the probability of cash insolvency increases. The second element of financial risk relates to the relative dispersion in the earnings available to equity shareholders. Financial risk, therefore can be avoided by the firm if it does not raise funds through fixed bearing securities. The variability in EPS and Return on Equity occurs due to employing additional funds using debt.

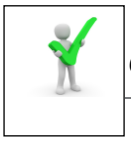
**Operating risk**

Operating risk is caused due to the variability of EBIT or you can say returns on assets. The risk arises due to environmental changes, changes in the policies of the government or changes in the inflation, changes in the cost of raw material and the likes. Therefore operating risk is unavoidable risk. The variability in EBIT has two parts;

a) Variability of Sales
b) Variability of expenses

The variability in sales may occur due to technological changes, changes in the cost of raw material, shift in consumer preferences, changes in the economic conditions, changes in inflation prevailing in the economy, policies of competitors, so on and so forth. However, variability in EBIT is also caused by variability in fixed and variable expenses. If the ratio of fixed expenses in comparison to variable expenses is higher then the firm will have high degree of operating leverage. High operating leverage leads to major increase in EBIT when there is increase in the sales. However, when company faces decline in sales then EBIT too declines with a very rapid rate. Operating leverages extremely impact the EBIT with varying sales. The riskiness of EBIT and EPS can be measured by standard deviation and coefficient of variation.

The financial leverage will be favorable for EPS and ROE only when the firms return on investments exceeds the interest cost and it will be unfavorable if the returns on investments are less than the interest cost.



## *Check Your Progress- B*

**Q1. What do you mean by the term 'Leverage'?**

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**Q2. What do you mean by Operating Leverage? How it is Calculated?**

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**Q3. What do you mean by Degree of Financial Leverage?**

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**Q4. Fill in the Blanks**

**a)** _____ arises due to environmental changes, changes in the policies of the government or changes in the inflation, changes in the cost of raw material and the likes.

**b)** _____ basically includes the risk of possible insolvency and the added fluctuations in the earnings per share that is caused by the use of financial leverage.

**c)** The Combine leverage is also termed as _____.

**d)** The financial leverage and the _____shares inverse relationships.

**Q5. Complete the table given below and find out the effect of financial leverage on the Company.**

| Particulars | Amount | Amount | Amount |
|---|---|---|---|
| Debt % | ₹ 0.10 | ₹ 0.20 | ₹ 0.30 |
| Interest Rate on Debt | ₹ 0.06 | ₹ 0.06 | ₹ 0.06 |
| Sales | ₹ 30,000.00 | | |
| Variable Cost Ratio | ₹ 0.30 | ₹ 0.30 | ₹ 0.30 |
| Income Tax Rate | ₹ 0.40 | ₹ 0.40 | ₹ 0.40 |
| Sales Growth Rate | ₹ 0.01 | | |
| | | | |
| | | | |
| Fixed Costs | ₹ 10,000.00 | | |
| | | | |
| | | | |
| Cash | ₹ 500.00 | ₹ 500.00 | ₹ 500.00 |
| Receivables | ₹ 800.00 | ₹ 800.00 | ₹ 800.00 |
| Inventories | ₹ 1,400.00 | ₹ 1,400.00 | ₹ 1,400.00 |
| Plant (Net) | ₹ 5,000.00 | ₹ 5,000.00 | ₹ 5,000.00 |
| Equipment (Net) | ₹ 2,000.00 | ₹ 2,000.00 | ₹ 2,000.00 |
| Total Assets | | | |
| | | | |
| Total Liabilities | ₹ 1,000.00 | ₹ 1,000.00 | ₹ 1,000.00 |
| Stock (Rs. 10) | | | |
| Tot. Liab./Equity | | | |
| | | | |
| | | | |
| Sales | | ₹ 0.00 | ₹ 0.00 |
| Fixed Costs | | ₹ 0.00 | ₹ 0.00 |
| Variable Costs % Sales | | ₹ 0.00 | ₹ 0.00 |
| Total Costs | | ₹ 0.00 | ₹ 0.00 |

| | | | |
|---|---|---|---|
| **Earnings Before Interest and Taxes** | | **₹ 0.00** | **₹ 0.00** |
| **Less: Interest** | | **₹ 0.00** | **₹ 0.00** |
| **Earnings Before Taxes** | | **₹ 0.00** | **₹ 0.00** |
| **Less: Income Taxes** | | **₹ 0.00** | **₹ 0.00** |
| **Net Income** | | **₹ 0.00** | **₹ 0.00** |

## 10.10 SUMMARY

In this unit, you learnt that how sensitive is earning per share (EPS) to changes in earnings before interest and tax (EBIT) under different capital structures. Capital structure refers to the relationship between the various long –term forms of financing such as debentures (long term), preference share capital and equity share capital including reserves and surplus. In this unit you also studied about the different leverages i.e. Financial leverage, Operating leverage and Combined leverage and how these leverages have enormous acceleration and deceleration effect on Earnings before Interest and Taxes as well as on EPS therefore, it is important for the company to manage these leverages appropriately.

## 10.11GLOSSARY

**Indifference Point** or EBIT-EPS Break Even Point indicates the point at which EPS is same irrespective of any level of financial leverage.

**Financial Leverage** indicates the impact on earnings or returns due to the usage of fixed cost funds in the capital structure.

**Operating Leverage** Operating leverage directly impact operating profit of company that is it impact EBIT whereas Financial Leverage affects Profit after tax or Earning per Share.

**Combined Leverage** is the impact on the Earning per share of the firm due to the usage of operating fixed cost as well as financial fixed costs (in terms of interest payments).

**Financial Risk** basically includes the risk of possible insolvency and the added fluctuations in the earnings per share that is caused by the use of financial leverage.

## 10.12 ANSWERS TO CHECK YOUR PROGRESS

**Check Your Progress –B**

4. Answers

a) Operating risk

b) Financial risk

c) Total leverage/Composite leverage

d) weighted average cost of capital

5. Answer

| Particulars | Amount | Amount | Amount |
|---|---|---|---|
| Debt % | ₹ 0.10 | ₹ 0.20 | ₹ 0.30 |
| Interest Rate on Debt | ₹ 0.06 | ₹ 0.06 | ₹ 0.06 |
| Sales | ₹ 30,000.00 | ₹ 30,300.00 | ₹ 30,603.00 |
| Variable Cost Ratio | ₹ 0.30 | ₹ 0.30 | ₹ 0.30 |
| Income Tax Rate | ₹ 0.40 | ₹ 0.40 | ₹ 0.40 |
| Sales Growth Rate | ₹ 0.01 | | |
| | | | |
| | | | |
| | | | |
| Fixed Costs | ₹ 10,000.00 | | |
| | | | |
| | | | |
| Cash | ₹ 500.00 | ₹ 500.00 | ₹ 500.00 |
| Receivables | ₹ 800.00 | ₹ 800.00 | ₹ 800.00 |
| Inventories | ₹ 1,400.00 | ₹ 1,400.00 | ₹ 1,400.00 |
| Plant (Net) | ₹ 5,000.00 | ₹ 5,000.00 | ₹ 5,000.00 |
| Equipment (Net) | ₹ 2,000.00 | ₹ 2,000.00 | ₹ 2,000.00 |
| Total Assets | ₹ 9,700.00 | ₹ 9,700.00 | ₹ 9,700.00 |
| | | | |

| | | | |
|---|---|---|---|
| **Total Liabilities** | **₹ 1,000.00** | **₹ 1,000.00** | **₹ 1,000.00** |
| **Stock ( Rs. 10)** | **₹ 8,700.00** | **₹ 8,700.00** | **₹ 8,700.00** |
| **Tot. Liab./Equity** | **₹ 9,700.00** | **₹ 9,700.00** | **₹ 9,700.00** |
| | | | |
| | | | |
| **Sales** | **₹ 30,000.00** | **₹ 30,300.00** | **₹ 30,603.00** |
| **Fixed Costs** | **₹ 10,000.00** | **₹ 10,000.00** | **₹ 10,000.00** |
| **Variable Costs % Sales** | **₹ 9,000.00** | **₹ 9,090.00** | **₹ 9,180.90** |
| **Total Costs** | **₹ 19,000.00** | **₹ 19,090.00** | **₹ 19,180.90** |
| **Earnings Before Interest and Taxes** | **₹ 11,000.00** | **₹ 11,210.00** | **₹ 11,422.10** |
| **Less: Interest** | **₹ 60.00** | **₹ 60.00** | **₹ 60.00** |
| **Earnings Before Taxes** | **₹ 10,940.00** | **₹ 11,150.00** | **₹ 11,362.10** |
| **Less: Income Taxes** | **₹ 4,376.00** | **₹ 4,460.00** | **₹ 4,544.84** |
| **Net Income** | **₹ 6,564.00** | **₹ 6,690.00** | **₹ 6,817.26** |
| | | | |
| **EPS** | **₹ 7.54** | **₹ 7.69** | **₹ 7.84** |

## 10.13 REFERENCES


- Kishore Ravi M.(2009), "Chapter 6 Analysis of Operating and Financial Leverage" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 171-201
- Khan, M.Y. and Jain, P.K.,( 1992), Chapter 14 Operating , Financial Leverage and Combine Leverage" in Financial Management Text and Problems., Second Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, pp 14.3-14.41
- Sristava Rajiv and Mishra Anil (2016), Chapter 17 Designing Capital Structure" in Financial Management, Oxford University Press, New Delhi, pp 439-464

- Pandey, I.M. (2010), "Chapter 14 Financial and Operating Leverage" in Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi, pp 289-312
- Rustagi R.P. (2011), Chapter 11 Financing Decision: Leverage Analysis and Chapter 12 Financing Decision: EBI-EPS Analysis" Financial Management-Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd. pp 368-409
- Van Horne, James C. and Wachowicz, John M. Jr (2009)," Chapter 16 Financial and Operating Leverage" in Fundamentals of Financial Management, 13th edition, Pearson Education Limited, pp 419-449
- Rubeh J. Bohanwala(2006), Chapter 8 Break Even Point and Leverage, in Financial Management, Second Edition, Taxmann Allied Services (P) Ltd. , pp 196- 211
- Kuchhal S.C. (1980), Chapter 7 Analysis of Operating and Financial Leverage" in Financial management: An Analytical and Conceptual Approach, Seventh Edition, pp 122-132


## 10.14 SUGGESTED READINGS


1. "Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
2. "Gopalakrishnan", Project Management, TMH, 2007.
3. "H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.
4. "Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.
5. "Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.
6. "Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.
7. "Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.
8. "Prasanna Chandra", Project Management, TMH,2007.
9. "Chowdry", Project Management, TMH,2007.
10. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition
11. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.

12. Financial Management: I.M. Pandey.

13. Financial Management: Theory and Practices- Prasanna Chandra.

14. Financial Management: Khan and Jain.

## 10.15 TERMINAL QUESTIONS

Q1. Explain the importance of EBIT-EPS analysis in choosing the best financing mix ?

Q2. What do you mean by Indifference point in the EBIT-EPS Analysis?

Q3. What do you mean by Operating Leverage and Degree of Operating Leverage? How the two are related to each other?

Q4. "When debt funds have greater weightage in capital structure as compared to owner's equity then leverage is said to be larger and *vice-versa".* Comment. Do there are exceptions to this.

Q5. What is combined leverage? What causes it? How is the degree of combined leverage calculated?

Q6. Discuss the applicability of operating and financial leverage in the present scenario.

Q7. Discuss the significance of financial leverage? Discuss its effect on financial risk.

Q8. When does operating leverage become favorable? State its impact on the risk.

Q9. Discuss when operating and financial leverages have risky and ideal situation.

Q10. The following details are available for ABC Ltd and XYZ Ltd. :

| | ABC Ltd | XYZ Ltd |
|---|---|---|
| Sales | 7,00,000 | 6,00,000 |
| Variable cost | 30 per unit | 40 per unit |
| Fixed cost | 250000 | 200000 |
| Interest | 20000 | 20000 |
| Units produced and sold | 500 | 500 |

Calculate the following;

a) Degree of operating leverage and financial leverage of ABC Ltd. and XYZ Ltd..

b) Comment on their risk position.

Q11.The following details is available for a company;

Sales 8,00,000

Variable Cost 2, 00,000

Fixed Cost 100,000

Debentures 4,00,000

Interest on Debentures is 5%

Equity Capital 6, 00,000

You are required to calculate ROI and all the leverages. Also find the level at which EBIT shall be zero.

Q12. Calculate the EBIT at which EPS indifference Point between the financing alternatives as listed below;

Equity Share Capital of Rs 10,00,000 (par value of Rs 10) and 12% Debentures of Rs 5,00,000

Or

Equity Share Capital of Rs 8,00,000(par value of Rs 10), 12% Preference Share Capital 300000 and 12% Debentures of Rs 4,00,000. Corporate tax rate is 30%

Q13. Rainbow Limited is setting up a project that require capital outlay of Rs 50,00,000. It has the following two alternatives in financing the project. The first alternative is financing all from equity and other alternatives is having debt: equity ratio of 2:1. The rate of interest payable on the debt is 15% pa. The corporate tax is 30. Calculate the indifference point between two alternative methods of financing.

Q14. Calculate the Degree of Operating Leverage, Degree of Financial Leverage and the Degree of Combined Leverage for the following companies. Also give interpretations for all the three leverages.

| | X | Y | Z |
|---|---|---|---|
| Output (Units) | 2,00,000 | 3,00,000 | 5,00,000 |
| Fixed Cost | 200000 | 3,00,000 | 3,00,000 |
| Variable Cost per unit | 2 | 2 | 2 |
| Interest | 50000 | 50000 | 50000 |

| | | | |
|---|---|---|---|
| Selling price in Units | 5 | 5 | 5 |

# Uttarakhand Open University, Haldwani

MS 109

## School of Management Studies and Commerce

**Financial Management**


Block III Long Term Investment Decisions

Block IV Current Assets Management

Block V Dividend Decisions

**MS 109**

# Financial Management

**Block – III**
**Block Title- Long Term Investment Decisions**
**Block – IV**
**Block Title- Current Assets Management**
**Block – V**
**Block Title- Dividend Decisions**

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# Block III
# Long Term Investment Decisions

# UNIT 11 CAPITAL BUDGETING CONCEPT & PROCESS - AN OVERVIEW



## 11.1 INTRODUCTION

In the previous unit you learnt about EBIT- EPS analysis and its relevance in financial decision making. You also learnt the importance of leverages in determining capital structure of the company. In this unit you will learn about the various techniques that will help you in valuing various project proposals. Capital budgeting is itself is the most crucial decision as these decision require heavy investments and they are also irreversible decisions; therefore these decisions are taken with utmost care and with proper calculations. Further, these decisions also require measuring of cash flows associated with each alternative available in terms of incremental cash flows, terminal cash flows and net operating cash flows. This unit shall introduce you with the concept of capital budgeting. Further, the measurement of capital flows shall be dealt in the next unit. After discussing the importance and features of capital budgeting, the unit shall also discuss important elements of capital budgeting process. The unit shall also apprise you with the various investment decisions that are relevant for the growth and development of the organisation.

## 11.2 OBJECTIVES

After reading this unit you will be able to:

- Understand the meaning of Capital Budgeting.
- Know the features of Capital Budgeting Decisions.
- Identify important steps in Capital Budgeting Process.
- Learn the types of investment decisions.

## 11.3 MEANING OF CAPITAL BUDGETING

Capital Budgeting is basically concerned with long term planning for capital expenditures and their financing decisions. It therefore deals with both raising of long term funds for the organisation as well as with their effective utilisation. In capital budgeting decisions, managers are basically concerned with how large funds can be invested effectively in projects or in fixed assets that may result into profitable returns over a long period of time. These decisions could therefore be for purchase of fixed assets, addition of fixed assets, and modification of fixed assets, replacement of fixed assets and even for disposition of fixed assets.

Accordingly, capital budgeting decisions may relate to;

a) Purchase of new plant, equipment or land or building.
b) Replacement of Machinery or Plant with new effective ones.
c) Research and Development Projects.
d) Diversification of Product Line.
e) Promotion of Products and Services i.e. amount invested in advertising and promotion.

Thus, capital budgeting is a process that requires crucial decision making with respect to the investments of large amount of funds. Further, returns from such investments are expected over a long time horizon. Hence, such decision making is related to the allocation of funds in various long-term assets. Let us learn about the concept of capital budgeting through few definitions.

- "The process of identifying, analysing and selecting investment projects whose returns (cash flows )are expected to extend beyond one year". Horne and Wachowicz
- "The firm's formal process for the acquisition and investment of capital." Hampton, JohnJ.
- "Capital Budgeting is a decision making situation where large funds are committed (invested) in the initial stages of the project and the returns are expected over a long period of time". Rustagi R. P.

- "Capital budgeting involves planning of expenditure for assets and return from them which will be realized in future time period". Milton
- Capital budgeting is "a process for evaluating proposed long-range projects or courses of future activity for the purpose of allocating limited resources."{Institute of Management Accountants (formerly National Association of Accountants)}, Statements on Management Accounting Number 2: Management Accounting Terminology (Montvale, N.J.: NAA, June 1, 1983), p. 14)
- "Capital budgeting refers to the total process of generating, evaluating, selecting, and follows up of capital expenditure alternative". Pandey I.M

Therefore from the above definitions we can infer that, Capital Budgeting is the process of determining which investment proposal should be accepted with a given allocation of funds. Therefore, capital budgeting decisions are so vital for organisations that these can determine growth, survival, competitive position and structure of the company.

Although, Capital Budgeting is a continuous process that involves contribution of various functional units such as Production, Marketing, Sales, Human Resource, Information Technology and other relevant functional units, but the role of financial manager is crucial in the investment appraisal process as it requires critical, thorough and comprehensive analysis of various alternative investment proposals. Accordingly, the finance manager should have to keep in mind the goal of shareholder wealth maximisation in each step of capital budgeting process.

## 11.4 IMPORTANCE OF CAPITAL BUDGETING

Capital Budgeting decisions are important for companies and firms; it is not only vital for large organizations but is equally relevant to the small firms as well. It is a technique for chalking out decisions about capital projects having life of more than 12 months. The investment proposals majorly constitute the long term assets of the balance sheet and they are of considerable importance, size, and worth and hence they eventually determine the future of corporations. Therefore, reversing capital decisions in case of erroneous decisions is not easily feasible and accordingly, they are very costly for an organisation. Indeed, the real capital investments also greatly impacts working capital or capital structure of the company. Capital Budgeting principles are also applicable to other corporate decisions, such as investments in working capital position, valuation of equity and debt, leasing, mergers and acquisitions, and debt repayment. Therefore, investment appraisal assists managers in forecasting additional funds required. It also enables top management in establishing coordination among various divisions and departments while implementing plans and targets. Capital budgeting decisions directly contributes in the maximizing shareholder's value therefore it is important for an analyst to ensure valuation of assets in the broader interest of stakeholders. Further, in the present scenario where building a mall or apartments, or

extending a product line, require extensive analysis for accurate forecasting, it is therefore imperative to apply various techniques of capital budgeting using simulation analysis, decision tree analysis, sensitivity analysis, CAPM and other related tools and techniques. These techniques are evolved from the fields of mathematics, logic, economics and psychology and they that help decision makers in drawing conclusions about risk or uncertainty. However, you would learn in detail about their relevance later in unit XIV. Thus, the importance of capital budgeting can be emphasized in the light of types of capital expenditures, long-term consequences, irreversible choices and complicated decision-making.

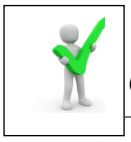
Therefore, on the basis of the above discussion, we can infer that capital budgeting decisions are the decisions that involve detailed insights, calculations and aspirations of top level management. Further, if such decisions are delegated then the control from top management is also required for selecting the best proposal out of the given or available alternatives as significant amounts of cash and debt funding are often involved in these investment decisions. Therefore, poor investment choices can have a catastrophic impact on the business.

## 11.5 NATURE AND FEATURES OF CAPITAL BUDGETING DECISIONS

Capital budgeting is a multi fold activity which requires exploring new investment proposals, identifying profitable ventures, examining manufacturing, engineering and marketing considerations for assessing the implications of accepting any investment proposal in terms of revenue stream, profits, sales, income and social impact. Capital Budgeting decisions generally involve decisions of longer time span, cost more funds, and require much more data to be gathered as part of their assessment than the current assets management. Therefore, on the basis of the above discussion, the following basic features of capital budgeting are identified;

1. **Irreversible in Nature-** Capital Budgeting decisions are irreversible in nature. Therefore, these decisions require careful examination and assessment. In case of wrong decisions, the only alternative shall be sale of capital assets as scrap at a substantial loss and hence, this will result into huge abandonment cost and multifarious detrimental effects for an organisation.
2. **Large Initial outlays-** Investment appraisal decisions require heavy investment in the capital expenditure. Accordingly, it is rational for a company to plan its investment programmes carefully with strategic arrangements for raising funds for such programmes. The initial investments for such projects are extremely enormous and are generally followed by cash inflows over a series of years. Hence, capital budgeting involves exchange of present resources particularly cash for future benefits as these would be received by the firm over a number of years.

3. **Requires in-depth and critical analysis-** Capital Budgeting decisions requires in-depth and critical analysis as these decisions have far reaching impact on company's profitability, sustainability and flexibility over the long term. Therefore, managers have to carefully chalk out these decisions because it is not only going to affect long term assets but it will have subsequent impact on the current assets as well as working capital position of an enterprise.
4. **Determines future growth of the organization-** Capital budgeting decisions determine the growth, expansion and fortunes of the company as these are intricate decisions that have the potential of making large anticipated returns in the future. Further, capital budgeting decisions helps management in forecasting requirements for funds and help top management in deciding about operating targets of various Departments, Plants and Divisions.
5. **Strategic and Risky Decisions**- Since large amount of capital budgeting decisions require assessment of probable future events that are uncertain and difficult to predict in terms of probable benefits and probable cost. Therefore, capital budgeting decisions requires assessmement of nature and scope of the unexpected setbacks that may undermine the attainment of investment objectives. The basic threat in capital budgeting decisions is that they have very high probability of not producing cash flows as anticipated by the finance or project managers. Therefore, capital budgeting embodies various strategic, human, technological and technical aspects that require tremendous, systematic, and careful planning together with cautious uncertainties assessment. This forces somewhere managers to also reckon on intuition, skills, past experiences on similar ventures and situations.
6. **Long term implications-** The impact of capital budgeting decisions are realized over a long period, and therefore these decisions are of paramount importance in influencing rate and direction of the growth of a firm. In case of erroneous decisions, a firm has to lose a sustainable amount of resources that are committed to a specific project. For example in case of unprofitable venture, a company has to bear the burden of fixed cost as well as heavy operating costs to the firm.



***Check Your Progress-A***

**Q1. What do you mean by Capital Budgeting?**

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**Q2. Why capital budgeting decisions are important for an organization?**

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**Q3. What are the various features of Capital Budgeting Decisions?**

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**Q4. Fill in the Blanks with appropriate word or words.**

**i.** _____is the process of determining which investment proposal should be accepted with a given allocation of funds.

**ii.** The impact of capital budgeting decisions is realized over a long period, and therefore these decisions are of paramount importance in influencing _____of the growth of a firm.

## 11.6 PROCESS OF CAPITAL BUDGETING

The process of capital budgeting involves devising appropriate plans and process for allocating capital expenditure. It also helps managers in maintaining closed liaison with the operating plans and goals of different Divisions and Departments. Therefore, before initiating for capital budgeting process, the organization needs to finalize the following aspects pertaining to capital expenditure. These are;

a) Duration of the Project.
b) Amount of funds required to be ploughed in the project.
c) Amount of funds available or going to be available with an organization.
d) Identifying phases when available funds shall be invested at various stages.

Let us now have a look at the capital budgeting process which is important in yielding returns that accrue over the life span of the projects. The capital process start with identifying various investment alternatives and ends with reviewing or reassessing the project implemented.

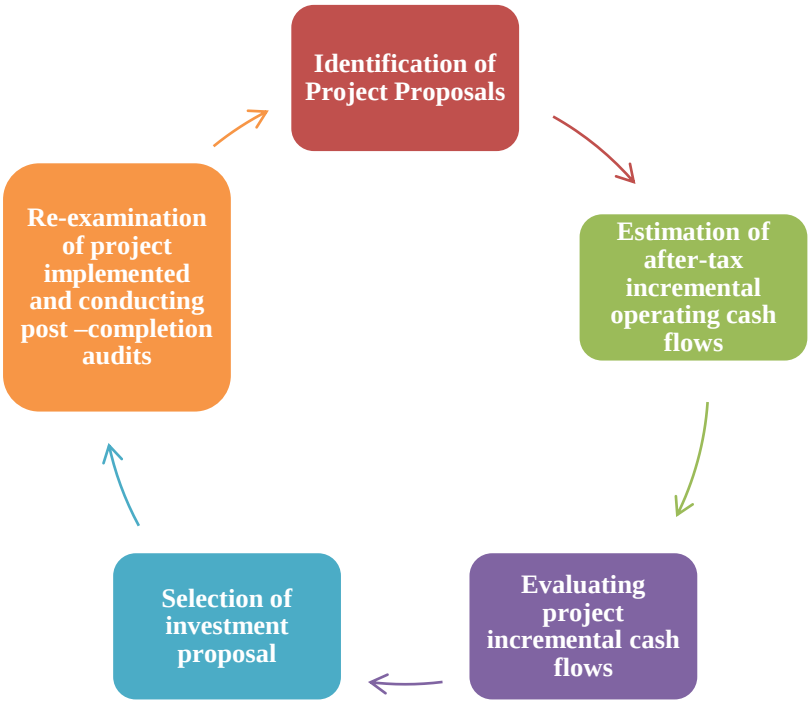



**Fig 11.1 Process of Capital Budgeting**

a) **Generation of Investment Project Proposals in lieu of the strategic objectives of the organization-**

The investment projects are identified on the basis of the studies conducted for assessing SWOT, SWOC, ETOP and the other environmental appraisal techniques. The organization tries to identifies funds availability and requirement *vis-a-vis* priorities within the broad framework of company's objectives and goals

The project proposals are assessed on the basis of market feasibility, technical feasibility and financial feasibility. Demand and price estimates are decided for market feasibility on the basis of economic factors and indicators, demand and supply prediction, critical success factors and others. Technical feasibility is explored for estimating commercial viability of the project. Financial feasibility is generated for the project proposal on the basis of operating cost, debt-service coverage ratio, net present value or internal rate of return, liquidity, pattern of cash flows and the likes. Further, organizations do estimate shadow prices also for conducting social-cost benefit analysis.

**b) Estimating after-tax incremental operating cash flows for investment projects-**

Timings of cash inflows and cash outflows are also important in selecting projects because these are directly associated with company's financial position. Estimating project cash flow is a difficult exercise as applying capital budgeting techniques to wrongly computed cash flows will give dubious results. Therefore, finance managers have to put in lot of efforts, time and money in estimating correct cash inflows and outflows pattern. The cash inflows are calculated on the basis of data fetched from

production, marketing accounting, human resources and research departments. Therefore, finance manager need to check the information received for assessing relevance and accuracy. However, generally accounting data serve as the basis for estimating the cash flows.

Since, cash flows are series of cash receipts and payments that are spread over the life of investment, therefore estimates of funds and timings of cash inflows should be assessed on incremental basis.

**c) Evaluating project incremental cash flows-**

Organizations need to consider that additional cash flows that results due to investment project should be taken into account while considering the project proposals, the incremental cash flows should be considered on the basis of absolute cash flows and relative cash flow. Generally, when the incremental cash flows for a certain proposal are calculated by comparing with a hypothetical cash flow project, it is called as absolute cash flow; on the contrary when incremental cash flows are calculated on the basis of comparison between two real alternatives; it is called as relative cash flows. The project's appropriate cash flows are those that are incremental to the identified parameters of firm's acceptance of the project. The principles of incremental cash flows are quite relevant for the replacement decisions. Incremental cash flows for project assessment consist of all adjustments to the future cash flows of the company resulting directly from the project.

**d) Selecting investment proposal on the basis of shareholder's wealth maximization objectives-**

Capital budgeting decisions needs to be selected with the given parameters to ensure that the investments are in reasonable limits so that most desirable projects gets superiority over the other. Further, in replacement decisions normal wear and tear or obsolescence are also considered while selecting projects. The selections of projects are made generally on the basis of the following categories;

i) Necessity of selection due to satisfactory operations.
ii) Replacement due to obsolesces, wear and tear and infusion of new technology or equipment.
iii) Desirability due to increase in revenues.
iv) Desirability due to expansion and development.
v) Retaining or extending share of the market.

**e) Re-examining of implemented project and conducting post –completion audits-**

For reexamining and reviewing selected projects, many companies formulate committees to assess departmental or divisional priorities in context to urgency, desirability, profitability, social relevance and alternatives available. After this, a consolidated report is forwarded to the top management for its final approval. The top management reviews the proposal from the overall point of view and grants authority to commit funds to the proposals. Once, the approval is received, steps are

initiated to receive funds from banks, sponsors and other financial institutions. After the project is implemented, time to time reviews are conducted to assess that how the project is able to achieve targets as specified for various phases. Later post completion audit is performed by top management for estimating whether project is able to achieve the yardsticks set for the project in terms of timings, revenues, profits and social contribution. The purpose of the post-completion audit is to assess the efficiency and effectiveness of the management's capital budgeting decision. Post-completion auditing (PCA) of capital investments is a formal method that monitors the results of individual investment projects after the original investment has been finished and the project is operational.

Thus, due to its complexity in capital budgeting decisions, the step by step process should be followed by the finance manager for maximizing long term profitability of the organization.

## 11.7 TYPES OF INVESTMENT DECISIONS

For evaluation purposes, projects can be classified into various categories and accordingly the selection of evaluation criteria, approach for handling the projects, information to be gathered and decision making approach accordingly varies as per the category. The various ways of classifying projects are listed as under;

- **Small and Large Projects**

Small projects are the one which generally require fewer investments of funds and cost and generally have to spend less resources, time, efforts and resources. Further such projects require small development and implementation team and generally have a span of couple of weeks, months, or maximum of few years. Such projects require less reliability and accuracy in data analysis and selection of projects. However, large projects require careful examination of facts and figures as these requires heavy investment of funds, resources, time and energy. These projects require accurate reliability and analysis of data with appropriate selection criteria. Company may face with serious repercussions if company takes wrong decisions for such projects.

- **Expansion of Existing Projects Vs New Projects**

Companies generally opt for expanding its product line or production capacities due to high demand for its products in the market or due to insufficient manufacturing capacities. Adopting expansion project requires further investment of funds. Generally company undertakes small projects and with increase in revenues and demand, companies go on to expand their production capacities. For example, if a company producing fast moving consumer goods and wants to expand its capacity then the alternative available for the company shall be either to explore opportunities for forward or backward integration or may

enter into new product line in FMCG Sector. However, in case of exploring new project alternatives, the same company may plan for entering into telecom or consumer durables sector.

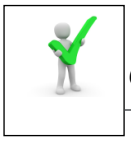
Therefore, undertaking capital budgeting decisions for new and expansion projects requires little bit different approach. In the sense, expansion project requires less ease and pace in data collection and analysis in comparison to new projects. However, new project requires accurate information, analysis and forecasting regarding project proposals.

- **Replacement Vs Modernization Projects**

Replacements and Modernization projects generally are for increasing the operational or production capacities of plants, machinery and equipments. They are undertaken with an intention of cost reduction. In such cases, a firm shall have to decide either to replace the old machine with the latest one or shall modernize the existing assets with the new capabilities. Replacement Projects are undertaken for the fixed assets if they are worn, outdated or obsolete due to change in the technologies. Replacement decisions are also called as cost reduction investments as these decisions contribute in introducing efficient and economical asset. Modernization decisions generally contribute in expanding revenues as well as in reduction of operational cost.

- **Independent Vs Mutually Exclusive Projects**

Independent projects do not compete with one another rather acceptance of one project results into possibility of losing another. These are accept or reject proposals which are selected by the analyst on the basis of various tools and techniques of capital budgeting. These projects serve altogether different purposes. For example, selection of expanding capacity through manually aided machine or computerized aided machinery shall be undertaken by the company on the basis of profitability and availability of funds. However, mutually exclusive projects are for same purpose and they compete with each other Acceptance of one proposal will lead to rejection of other. For example, company has to decide to select one of the technologies out of many for manufacturing a product. These projects require critical evaluation of proposals as only one proposal shall be selected and others shall be rejected at the same point of time.



***Check Your Progress- B***

**Q1. Narrate the steps in Capital Budgeting Process.**

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**Q2. What are the various types of investment decisions?**

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**Q3. Write True/False against the following;**

i. Large projects are the one which generally require fewer investments of funds and cost and generally have to spend less energy, efforts and resources.
ii. Modernization decisions are also called as cost reduction investments as these decisions contribute in introducing efficient and economical asset.
iii. Independent projects do not compete with one another rather acceptance of one project preludes the possibility of losing another
iv. The cash inflows are calculated on the basis of data fetched from production, marketing accounting, human resources and research departments.

## 11.8 SUMMARY

In this unit, you learnt why capital budgeting process is important for project selection, expansion and replacement decisions. You also learned that it is important for a company to evaluate proposed project accurately as it will determine the growth of the company. In the next unit, you will learn how to estimate cash flows for a project which is again an important step in evaluating project proposals.

## 11.9 GLOSSARY

**Capital Budgeting** deals with both raising of long term funds for the organisation as well as with their effective utilisation.

**Replacements and Modernization projects** generally are for increasing the operational or production capacities of plants, machinery and equipments.
**Backward Integration** It involves creation of facilities, raw material components, part or equipment that is required for existing production.
**Forward Integration** It involves establishing manufacturing units where products currently produce serve as a raw material or basic inputs for other products.

## 11.10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

Q4. Fill in the Blanks with appropriate word or words.

i. Capital Budgeting
ii. rate and direction

Check Your Progress –B

i. False
ii. False
iii. True
iv. True

## 11.11 REFERENCES


- Brigham Eugene F., Financial Management Theory and Practice, Retrieved from https://books.google.co.in/books?id=wLix9OceP3MC&pg=PA342&lpg=PA342&dq#v=onepage&q&f=false, pp. 342, Last accessed on 8/2/2020
- Hampton, J. John(1988), Financial Decision Making, Concepts, Problems and Cases. New Delhi: Prentice Hall of India.
- Kishore Ravi M.(2009), "Chapter 11 Project Planning and Control" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 328-361

- Pandey, I.M. (2010), "Chapter 8 Capital Budgeting Decisions" in Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi, pp 141-165
- Rustagi R.P. (2011), "Chapter 6 Capital Budgeting: An Introduction" in Financial Management- Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd., pp184-201
- Van Horne, James C. and Wachowicz, John M. Jr (2009), "Capital Budgeting and Estimating Cash Flows" in Fundamentals of Financial Management, 13th edition, Pearson Education Limited, pp 307-322
- (Institute of Management Accountants (formerly National Association of Accountants), Statements on Management Accounting Number 2: Management Accounting Terminology (Montvale, N.J.: NAA, June 1, 1983), p. 14)


- **Web links referred:**
- https://nscpolteksby.ac.id/ebook/files/Ebook/Accounting/Cost%20Accounting/Chapter%2014%20-%20Capital%20Budgeting.pdf, Last accessed on 15/7/ 2019
- https://www.reference.com/business-finance/mutually-exclusive-projects-99ecf7953eeb15a8, Last accessed on 8/2/2020
- http://www.opentextbooks.org.hk/ditatopic/15785, Last accessed on 8/2/2020

## 11.12 SUGGESTED READINGS


1. Chandra, P., Financial Management—Theory and Practice, New Delhi, Tata McGraw
2. Hill Publishing Company Ltd., 2002, p. 3.
3. "Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
4. "Gopalakrishnan", Project Management, TMH, 2007.
5. "H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.
6. "Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.
7. "Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.

8. "Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.
9. "Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.
10. "Prasanna Chandra", Project Management, TMH,2007.
11. "Chowdry", Project Management, TMH,2007.
12. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition
13. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
14. Financial Management: I.M. Pandey.
15. Financial Management: Theory and Practices- Prasanna Chandra.
16. Financial Management: Khan and Jain.

## 11.13 TERMINAL QUESTIONS

Q1.What is Capital Budgeting? Why it is so important for a finance manager to take appropriate capital budgeting decision?

Q2. Explain the nature and features of Capital Budgeting Decisions.

Q3. What are the various types of investment decisions?

Q4. Why is capital budgeting important for an organization?

Q5. Discuss the steps involved in the capital budgeting process

# UNIT 12 ESTIMATING PROJECT AFTER TAX INCREMENTAL OPERATING CASH FLOWS



## 12.1 INTRODUCTION

In the previous unit you learnt that capital budgeting is the most crucial decisions for a company as it requires heavy investments and hence these decisions are taken with utmost care and accuracy. Assessment of projects proposals are based on existing data as well as they are also based on future projections. Therefore, these decisions require the measuring of cash flows in terms of incremental cash flows, terminal cash flows and net operating cash flows.

## 12.2 OBJECTIVES

After reading this unit you will be able to:

- Prepare cash flow estimation for the projects
- Measure incremental cash flows.
- Calculate cash flow estimates for Replacement Decisions

## 12.3 PROJECT CASH FLOW ANALYSIS

The most important and crucial decision in project evaluation is to estimate project cash flows. It is crucial because it requires assessment of risk and incorporation of uncertainty into project analysis as company has to chalk out appropriate decisions pertaining to projects selection. Peeping into future for the assessment of correct cash flows is the most difficult and challenging task, but as a Project Manager or as a Finance Manager you need to identify, categorize and estimate cash flows and investment outlays. As a Project Manager or as a Finance Manager, one have to coordinate various departments for fetching information and on the basis of information so obtained, the projections are made on the basis of consistent economic assumptions, assessing relevant variables and minimizing dispositions. For evaluating a project, one need to assess the correct cash flows which are incremental after-tax cash flows associated with the project.

However, cash flows should not be assessed as profits. There is difference between cash flows and profits. Profits which are also termed as net income, is the difference between sales revenue and expenses of a firm. It is based on the accrual concept, it is recognized when it is earned not when cash is received and expense is recognized when it is incurred than when cash is paid. Cash flow is the difference between cash received and cash disbursed. Profit assess your income and expenses at a specific point in time whereas Cash Flow is more dynamic, looking at the timing of the movement of money in and out of your business every day. Depreciation is not a cash outlay but it is deducted when net income is calculated. Cash flows considers time value of money however accounting income ignores it.

Therefore, the above may be written in terms of equation;

**Profits= Revenues-Expenses-Depreciation**

**Cash Flows=Revenues-Expenses-Capital Expenditure**

Cash flows does not consider depreciation as it does not requires any cash payments whereas it includes cash paid for capital expenditures.

The above equation may also be written as;

**Cash Flows= (Revenues-Expenses-Depreciation)+Depreciation-Capital Expenditure**

**Cash Flows= Profits+ Depreciation- Capital Expenditures**

For the assessment of project's value, project net cash flows are considered and not the accounting income.

# 12.4 INCREMENTAL CASH FLOWS

The cash flows of a project are assessed in incremental terms. The estimation of the cash inflows and outflows and the timing of these cash slows should be assessed on incremental basis. For calculating incremental cash flows, you in the capacity of Finance Manager have to estimate the cash flows of a firm with project and the cash flows of a firm without the project.

**Incremental Cash Flows = Company's Cash Flows with the Project- Company's Cash Flows without the Project**

As per Ross, Westerfield and Jordan, Incremental Cash Flows for project evaluation consist of any or all changes in the firm's future cash flows that are direct consequence of taking the project.

Further, when the incremental cash flows for an investment are calculated in juxtaposition with the hypothetical zero-cash-flow project, then it is termed as absolute cash flows whereas, incremental cash flows calculated on the basis of comparison of cash flows of two projects then such analysis is termed as relative cash flows.

Cash Flow of Project 1 of Year 1–Cash Flow of Project2 of Year 1= Incremental Cash Flow for year 1.

**Components of Cash Flows**

The following are the components of cash flows;

For calculating cash flows the following aspects shall be estimated;

**Initial Investment** is the cash outflows at the time of establishment of a project. In other words, it is the amount required to start a project. It is also called initial investment outlay or simply initial outlay. In case of Plant and Machinery or other Long Term Assets, it consists of original value of the asset together with the freight and installation charges. In case of Project, initial investment shall be equal to gross investment plus increase in net working capital. The present value of the initial outlay is simply the cost of the outlay since it occurs today (year 0). Net working capital requirement is projected in the initial year also because investing in project also demands investment in working capital in form of cash, inventories and receivables.

Other expenditure which is occurred while establishing a project for example installation, electrification, water supply, vehicle charges, fire fighting etc. shall be included in initial investment. Further, preliminary and operative expenses shall be clubbed in initial investments as they have happened before the starting of a project. Any contingency associated in the establishment of a project shall also be counted into initial investment.

**Net Cash Flows**

Net cash flow is the difference between a company's cash payments and cash receipts at a particular period of time. It is estimated on after tax basis. It is basically consist of annual cash flows occurring from the operation of the project but it also takes into consideration the changes in net working capital and capital expenditures. (Pandey I.M.) For the calculation of Net Cash Flows, Expenses and Taxes are deducted from the revenues.

**Net Cash Flows=Revenues-Expenses-Taxes**

**Depreciation and Taxes**

Non cash charges do impact on cash flows and these needs to be carefully considered as they affect tax liability. Depreciation is the assigning or allocating of a Plant Asset's cost to Expense over the accounting periods that the asset is likely to be used. Depreciation is a non cash expense from the perspective of cash flows and hence it has an indirect effect on the taxation as it reduces tax liability of a company. This provides tax shield to the company as increase cash flow because cash outflows which are saved can be assessed as cash inflows. Some authors narrate depreciation tax shield as tax saving from tax allowable depreciation. The tax benefit of depreciation is assessed as depreciation multiplied with marginal tax rate.

Depreciation is often calculated under different methods for financial accounting standards than for tax purposes. The amount of the tax shield at a particular time is estimated by multiplying the tax-basis depreciation expense by the marginal tax rate applicable for that period. This tax shield is then added back to the after-tax operating cash flow forecast.

Net Cash Flows= Revenues-Expenses- Taxes

Net Cash Flows= Revenues- Expenses- Taxes (Revenues- Expenses-Depreciation)

Net Cash Flows= Profit before Depreciation, Interest and Taxes (PBDIT) (1-Tax) +Tax (Depreciation)

**Net Working Capital**

Another item that needs consideration to ascertain cash flows is the working capital. Changes in the working capital affects the cash flows , therefore working capital requirement should considered while assessing cash received from the revenues and cash paid for the expenses. The actual cash received and cash paid while carrying operating activities differs from revenues and expenses as given in Profit and Loss Account. Therefore, this difference shall be offset by adjusting the changes in the net working capital. The difference between the increase in current assets and the increase in current liabilities is the change in the net working capital. If this increase is positive then it is subtracted from after tax operating profit and if there is a decrease then it is added to after tax operating profit.

The increase in the working capital is basically cash outflow that must be incorporated in the cash flow projections.

**Net Cash Flows= Profit before Depreciation, Interest and Taxes (PBDIT) (1-Tax)+Depreciation-Net Working capital**

## 12.5 TERMINAL CASH FLOWS

Terminal cash flows accrue in the last year of project. It refers to the cash flow that takes place at the end of the project life. Terminal cash flow takes into consideration net salvage value collected at the time of liquidation of the project. Three aspects need to be considered while calculating cash flows in terminal year; these are;

a) Salvage Value
b) Net Working capital
c) Effects of Taxes

Terminal cash flows not only include operational cash flow in the terminal year but, it also includes cash inflows arise due to release of working capital. Increment in net working capital is considered as cash outflow while decrement in networking capital is considered as cash inflow. Basically, funds invested in net working capital at the time of starting of a project would be released in the last year when the project shall come to the end. Further, Terminal Cash Flows incorporates any tax advantage or disadvantage that may arise on the completion or discontinuation of a project. Depending upon the tax conditions, there could be tax savings or tax incidence on the disposal of fixed assets.

**Salvage Value**

Salvage Value is the amount recovered from the sale of assets. Pandey (2010) describes Salvage value as the market price of an investment at the time of the sale. He further states that the cash proceeds net of taxes from the sale of the assets shall be treated as cash inflow in the last year. The cash flow estimation of the tax is the written down value of the block of asset that is reduced by the amount of the salvage value realized. The firm does not get depreciation for subsequent period on the asset sold to the extent of differential of book and salvage value. When salvage value is greater than book value then the resultant is the tax loss that is equivalent to the present value of tax shield on the resultant amount of salvage value minus book value. This tax loss is deducted from the salvage value for the purpose of determination of cash flow from the sale of an asset. If the salvage value is less than book value then tax benefit shall be equal to the present value of tax shield on the resultant amount of difference between book value and salvage value. This is added back to the Salvage Value for calculating cash flows from the asset so disposed. Further, at the time of replacement decisions, salvage value of the newly purchased asset shall increase the cash inflow in the last year. Further, salvage value of the existing asset in the present time shall reduce the initial cash outlay of the new asset and salvage value of the existing asset at the end of the normal

life shall reduce the cash flow of the new investment in which the existing asset is sold.(Pandey I.M)

If Salvage Value (SV) > Book Value (BV)

Cash flow from the sale of asset= Salvage value-PV of tax shield on (Salvage Value-Book Value)

If Salvage Value (SV) <Book Value (BV)

Cash flow from the sale of asset= Salvage value+ PV of tax shield on (Book Value- Salvage Value)

By adjusting book value of the block of asset the tax benefit is deferred (presuming that the book value is greater than salvage value) with progressive reduction in the benefit each year. Depreciation under the written down value is perpetual and hence the present value of depreciation tax shield is;

PV of Depreciation Tax Shield= $\frac{Txd}{r+d}$(BV-SV)

Where tx- Tax rate

d= Depreciation rate

r=Cost of capital (discount rate)

**Release of Net Working Capital**

At the time of termination of a project the funds at the time of initial investment tied up in the form of working capital shall be released. If there is increase in net working capital then it shall be taken as cash outflow and *vice versa* i.e. if there is decrease in net working capital then it is cash inflows.

To illustrate, let's take an example to determine the cash flows,

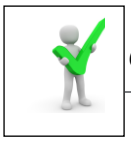
Company Aspirations Ltd. is considering a capital project in which the following data is available;

The initial investment of the project will be 500,000,000 which require investment of Rs. 400,000,000 in Building and Plant and Machinery and Rs 100,000,000 in Net Working Capital. Further, the project has employed 200,000,000 of equity capital, 10% preference share capital of Rs. 200,000,000 and 15% Redeemable Debentures of Rs 100,000,000. The life of the project is expected to be 5 years and a salvage value of Rs 300,000,000 and net working capital shall fetch Rs 100,000,000 i.e. at its book value. Revenues from the project are expected to 360,000,000. The fixed cost on the account for the project is expected to be 4,000,000 and the variable cost is expected as 150,000,000 in the first year, Rs 200,000,000 in the second year , Rs 205,000,000 in the third year, 215,000,000 in the fourth year and Rs 225,000,000 in the fifth year. The tax rate shall be 30%. Further, the plant and machinery shall be depreciated with Rs 80,000,000 every year. Calculate the project cash flows.

| | 0 Year | 1 Year | 2 Year | 3 Year | 4 Year | 5 year |
|---|---|---|---|---|---|---|
| **Initial Investment** | -500000000 | | | | | |
| **Fixed Assets** | -400000000 | | | | | |
| **Net Working capital** | -100000000 | | | | | |
| **Revenues** | | 360000000 | 360000000 | 360000000 | 360000000 | 360000000 |
| **Fixed Cost** | | 4,000,000 | 4,000,000 | 4,000,000 | 4,000,000 | 4,000,000 |
| **Variable Cost** | | 150,000,000 | 200,000,000 | 205,000,000 | 215,000,000 | 225,000,000 |
| **Total Cost (other Depreciation and interest** | | 154,000,000 | 204,000,000 | 209,000,000 | 219,000,000 | 229,000,000 |
| **Depreciation** | | 80,000,000 | 80,000,000 | 80,000,000 | 80,000,000 | 80,000,000 |
| | | 234,000,000 | 284,000,000 | 289,000,000 | 299,000,000 | 309,000,000 |
| **Profit before tax** | | 126,000,000 | 76,000,000 | 71,000,000 | 61,000,000 | 51,000,000 |
| **Less Tax** | | 37800000 | 22800000 | 21300000 | 18300000 | 15300000 |
| **Profit after Tax** | | 88,200,000 | 53,200,000 | 49,700,000 | 42,700,000 | 35,700,000 |
| **Add Depreciation** | | 80,000,000 | 80,000,000 | 80,000,000 | 80,000,000 | 80,000,000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Cash Flows** | | 168,200,000 | 133,200,000 | 129,700,000 | 122,700,000 | 115,700,000 |
| **Net Salvage Value** | | | | | | 300,000,000 |
| **Recovery of Net Working Capital** | | | | | | 100,000,000 |
| **Terminal Cash Flows** | -500,000,000 | | | | | 400,000,000 |
| **Net Cash Flows** | -500,000,000 | 168,200,000 | 133,200,000 | 129,700,000 | 122,700,000 | 515,700,000 |
| **Book Value of Investment** | 500,000,000 | 420,000,000 | 340,000,000 | 260,000,000 | 180,000,000 | |

The Net Cash Flows for the company in first year is Rs 168,20,000 , Rs 133,200,00 in second year, Rs 129,700,000 in the third year, Rs 122,70,000 in the fourth year and 515,700,000 in the fifth year.



***Check Your Progress- A***

**Q1. What do you mean by Incremental Cash Flows?**

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**Q2. What do you mean by Terminal Cash Flows?**

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**Q3.How do you account for Release of Working Capital?**

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**Q4. Fill in the blanks using appropriate word/words;**

i. _____ are calculated by comparing alternative investments options.
ii. _____ takes into consideration net salvage value collected at the time of liquidation of the project.
iii. _____ is the assigning or allocating of a plant asset's cost to expense over the accounting periods that the asset is likely to be used.

## 12.6 CASH FLOW ESTIMATES FOR REPLACEMENT DECISIONS

The estimation of the cash flows for the replacement purpose is tricky as you have to first estimate the incremental cash outflows and inflows in relation to the existing project. Therefore, you will face tremendous challenge while going for replacement analysis as the relevant cash flows shall be the differential cash flows between existing project and replacement project. Replacement decisions are made regarding the existing machine equipment or asset that needs to be replaced by the newer version of the equipment or the different type of machine solving the same purpose. These decisions are taken for reduction in cost or for quality improvement. For such decisions you have to determine the cash flows that new asset generate and the impact on eliminating the cash flows generated by the replaced asset. The overall net effect of purchasing new assets to replace the older version of the asset shall be assessed.

**Initial Investment= Cost of new assets+ Net Working capital required for new asset-After tax salvage value recovered from the old asset-Net working capital required for the old asset**

**Or**

**Initial Investment= Initial investment needed to acquire new asset-After tax cash flows from liquidation of old asset**

**Operating Cash Flows= Operating Cash Flows from the new asset- Operating cash inflows from the old asset, if such decision has not been opted for**

**Or**

**Operating Cash flow= Operating Cash Flows from the new asset- Operating cash inflows from the old asset**

**Terminal Cash Flows= After tax Salvage value of the new assets+ Net Working capital release with the new asset- After tax salvage value of the old asset , if such decision has not been opted for- Net Working capital released from the old asset**

**Or**

**Terminal Cash Flows= After tax cash flows from termination of new asset-After tax cash flows from termination of old asset**

Let us take a hypothetical example to understand the above concept;

XYZ Ltd. is considering a proposal to replace the manual food processing machine costing Rs 1,00,000 with the fully automatic food processing machine worth Rs 1,50,000. The written down value of the old machine is Rs 50,000. The plant is expected to still function to 4 years after which it will have no salvage value. However, if sold today, then it will fetch salvage value of Rs 10,000. The expected life of fully automatic machine is 4 years which yield salvage value of Rs. 30,000. Due to fully automatic in nature, the new machine is projected to supplement additional benefit (before depreciation and tax) of Rs 60,000. As a Finance Manger, you are given the responsibility to calculate cash flows associated with this decision. The tax rate applicable is 30% to the Company. (Capital gain or loss, may be ignored for tax purposes.)

| **Initial cash Outflow** | | |
|---|---|---|
| Cost of new machine | | 150000 |
| Scrap value of Old Machine | | 10000 |
| | | 140000 |
| Subsequent Cash Inflows (Annual) | | |
| Incremental Benefit | | 60,000 |
| Less Incremental Depreciation | | 17500 |
| Depreciation on New Machine | 30000 | |
| Depreciation on Old Machine | -12500 | |
| Profit before tax | | 42,500 |

| | | |
|---|---|---|
| Less Tax | | 12750 |
| Profit after Tax | | 29,750 |
| Add Depreciation | | 17500 |
| Annual Cash Inflows | | 47,250 |
| | | |
| | | |
| Terminal Cash Flows | | 77,250 |

Therefore, annual cash flows for the company are calculated as 47,250.

## 12.7 OTHER ASPECTS TO BE CONSIDERED WHILE PROJECTING FOR CASH FLOWS

You should also be aware of the other aspects to be considered while projecting cash flows. These are;

**Installation Cost**

The initial cash outlays shall include installation cost, shipment, transportation etc. as these cost helps in bringing projects and equipments in working condition.

**Sunk Cost**

Sunk costs are the cost that has incurred in the past and that cannot be recovered in the future. These are not incremental cost and they are irrecoverable. Further, these are not relevant in capital budgeting analysis as they do not impact the cash flows relevant for the present decisions.

**Opportunity Cost**

While estimating project cash flows, you as a finance manager have to consider the opportunity cost related to the assets of the firm that it already owns. These are the cost of the resources which are already with the firm or are procured. This opportunity cost provides advantage to the firm which otherwise could have required additional outlays. This opportunity cost should be charged to the project as cost of alternative investment that has been forgone because of utilization of resources by the firm for the project and allocating these resources to a particular venture prevents their use for other projects at the same time. Therefore, these cost should be accordingly considered.

**Incidental Effects**

Contingent Costs are the cost with have some sought of uncertainty on the basis of past experience these costs may occur during the project. For example, if project is established in the outskirts of a city and therefore approach roads, residential houses, school and basic

amenities for the workers shall be developed by the company. Accordingly, such expenses shall be considered as contingent cost.

**Cannibalization**

Cannibalization is the reduction in the sales volume and revenue in an existing brand when a new product is introduced in a product line or in a product family is introduced. This may reduce the sales revenue of the existing product. This may lead to negative incremental effect on the new product and hence rejecting the old product. If firm is facing extreme competitive conditions and is not protected by entry barriers, then cost due to product cannibalization is not considered in incremental analysis. However, if there are entry barriers then costs pertaining to product cannibalization should be incorporated.

**Revenue Enhancement**

Increment in revenues due to newly created opportunities from the project and it should be included in the cash flows of the new project.

## 12.7.1 BASIC PRINCIPLES OF CASH FLOW ESTIMATION

There are four types of principles followed for assessing cash flows of a project, these are;

### 12.7.1.1 Principle of Incremental Cash Flows

This principle holds that cash flows should be measured in incremental terms. This principle states that a project proposal have chances of viability if it increases total profit more than total cost. This principle tries to ensure profitability outcomes from the project. An incremental cash flow is the additional operating cash flow that an organization receives after adopting new venture. A positive incremental cash flow denotes that the company's cash flow will magnify if project is accepted.

### 12.7.1.2 Principle of Consistency

This principle holds the view that there should be consistency in the cash flows and discount rates applicable to the cash flows. Two aspects to be considered in this principle is investor's group and inflation. There are different types of investors in a firm like the lenders or the stockholders and so on. Again, if it is not possible to consider every kind of investors' view, then the stockholder's view regarding the cash flow may be considered. The cash flows from all the investors' point of view shall be;

Cash Flow to all investors= PBIT (1-t) +Depreciation and non cash charges-Capital Expenditure-Changes in Net Working capital

The cash flow of project from the equity shareholders point of view shall be estimated as per the following;

Cash flow to equity shareholder=Profit after tax +Depreciation and other noncash charges-Preference dividend-capital expenditures-change in net working capital –Repayment of debt+ Proceeds from debt issues-Redemption of preference capital +Proceeds from preference issue

Now, as per this principle you should ensure consistency of the discount rate that is to be applied on the project cash flow. There are two types of discount rate known as the weighted average cost of capital and cost of equity. Weighted average cost of capital is taken while calculating cash flows to all investors and cost of equity is taken when calculating cash flows from the perspective of equity shareholders.

There are two ways of incorporating the inflation in the project cash flow estimates. The first option is to incorporate likely inflation in the project cash flow estimates. After this, a nominal discount rate is applied on the amount. The other way out is to calculate the project cash flows of the future in real terms with real discount rates.

Nominal Cash $Flow_t$=Real Cash $Flow_t$ $(1+\text{Expected inflation rate})^t$

Nominal discount rate=(1+Real discount rate)(1+expected inflation rate)-1

The relationship between real rates and nominal rates is well explained by Fisher Effect.

(1+Nominal Rate)=(1+Real rate)x(1+Inflation rate)

### 12.7.1.3 Principle of Financing Costs Exclusion or Separation Principle

This principle holds that the cash flows occurring to the company should be separated into investing and financing activity. As the initial investment funds can be raised from the various modes of financing like from debt, equity or hybrid financing. This principle examines that cash that may analyzed are those generated by the assets. These decisions are concerned with the ability of the asset in generating cash benefit rather than how these benefits shall be shared. This principle holds that while bringing out the profit, if the applicable interest is subtracted, the same amount should be added to the profit that remains after paying the applicable tax. On the other hand, if the tax rate is imposed directly on the profit (from which interest and taxes are not adjusted) the results shall be the same.

**Profit before interest and tax (1-t) =Profit before tax+ Interest (1-t) =Profit after tax+ Interest (1-t)**

### 12.7.1.4 Post Tax Principle

Post Tax Principle states that cash flows shall be measured on after tax basis as this will help in measuring cash flows with accuracy. Some firms follow the practice of neglecting the tax aspects and compensating the same by adopting higher discount rate. However, these discount rates are difficult and cumbersome to adjust and thus the after-tax rate of discount and after-tax cash flows should be used jointly. The following aspect should also be considered;

a) The average tax rate and the marginal tax rate are two different tax rates. The average tax rate is considered as the entire tax in proportion to the overall earning from the business. On the other hand, the marginal tax rate represents those taxes that are imposed on the marginal earnings income. Since, the tax rates are

progressive therefore generally; the average tax rates are always on the lower side of the marginal tax rate. Marginal tax rate is generally considered as more appropriate for the estimation of the tax liability.

b) The post tax principle explains that there can be possibility of losses for the firm as well as the project.
c) The post tax principle also holds that noncash charges like depreciation can affect project cash flows if such expenses affect tax liability of the company.

***Check Your Progress- B***

**Q1. What are the Basic Principles of cash flow estimation?**

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**Q2. How Cash Flow Estimates are calculated for Replacement Decisions?**

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**Q3. State True of False against the following;**

i. Principle of Incremental Cash Flows holds the view that there should be consistency in the cash flows and discount rates applicable to the cash flows.
ii. Post Tax Principle states that cash flows shall be measured on after tax basis as this will help in measuring cash flows with accuracy.
iii. Cannibalization is the reduction in the sales volume and revenue in an existing brand when a new product is introduced in a product line or in a product family is introduced

## 12.8 CASH FLOWS FROM THE POINT OF VIEW OF DIFFERENT PERSPECTIVES

There are several perspectives from which the cash flows may be viewed;

**Cash Flows relating to equity**

Cash Flows to equity shareholders are the cash inflows or cash outflows estimated from the perspective of equity shareholders. Thus, the preference dividend is an outflow from the point of equity shareholders.

**Initial Outflow= Equity component of initial investment**

**Annual cash flows=PAT-Preference Dividend +Depreciation+ Other Non cash Expenses**

**Terminal Cash inflows = Salvage Value (Net of tax) +Release of working capital – Repayment loans-Redemption of preference share capital**

**Cash flows to long term funds**

Cash flow to long term funds shall include cash flow from the perspective shareholders as well as lenders. Long term funds shall include long term debt, equity share capital, Reserve and Surplus, Debentures etc.

**Initial out flow= Long term funds+ working capital margin**

**Subsequent Annual Inflows= PAT+ Int (1-t) +Depreciation +Non cash expenses**

**Terminal inflows= Salvage Value + Release of working capital margin**

## 12.9 SUMMARY

In this unit you learnt that estimation of cash flows for a project is an important step in evaluating project proposals. You also learnt that peeping into distant future for the assessment of correct cash flows is the most difficult and challenging task, but as a Project Manager or as a Finance Manager you need to identify, categorize and estimate cash flows and investment outlays. In the next unit, you will be studying how to evaluate proposed project accurately using various capital budgeting techniques.

## 12.10 GLOSSARY

**Initial Investment** is the cash outflows at the time of establishment of a project.

**Contingent Costs** are the cost with have some sought of uncertainty on the basis of past experience and these costs may occur during the project.

**Cannibalization** is the reduction in the sales volume and revenue in an existing brand when a new product is introduce in a product line or in a product family. This may reduce the sales revenue of the existing product.

## 12.11 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

Q4. Fill in the Blanks with appropriate word or words.

i. Incremental
ii. Terminal cash flow
iii. Depreciation

Check Your Progress –B

Q4. State True or False against the following;

i. False
ii. True
iii. True

## 12.12 REFERENCES


- Kishore Ravi M.(2009), "Chapter 12 Capital Budgeting Techniques" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 363-396
- Khan, M.Y. and Jain, P.K. (1992), "Chapter 10 Capital Budgeting I : Principles and Techniques" in Financial Management Text and Problems. New Delhi: Tata McGraw Hill Publishing Company Limited.pp 10.3-10.63
- Pandey, I.M. (2010), " Chapter 10 Determining Cash flows for investment decisions" Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi, pp 199-228
- Rustagi R.P. (2011), "Chapter 6 Capital Budgeting: An Introduction" in Financial Management- Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd., pp184-201

**Web Links Referred**

- NPV, Open Textbook for HongKong, Available under Creative Commons-ShareAlike 4.0 International License, reteived from http://www.opentextbooks.org.hk/ditatopic/15785, last accessed 10/2/2020
- Kulatilaka Nalin and Marcus Alan J., Project Valuation Under Uncertainty: When Does DCF Fail?, Retrieved from http://onlinelibrary.wiley.com/wol1/doi/10.1111/j.1745-6622.1992.tb00229.x/full, last accessed 10/2/2020
- http://www.prd.uth.gr/uploads/discussion_papers/2003/uth-prd-dp-2003-17_en.pdf
- NPV vs IRR, Retrieved from http://accountingexplained.com/managerial/capital-budgeting/npv-vs-irr last accessed 10/2/2020
- What Are Mutually Exclusive Projects?, Retrieved from https://www.reference.com/business-finance/mutually-exclusive-projects-99ecf7953eeb15a8, last accessed 10/2/2020
- http://elearning.linnbenton.edu/mod/resource/view.php?id=237807
- Cash Flow, Retrieved from https://corporatefinanceinstitute.com/resources/knowledge/finance/cash-flow/, Last accessed 10/2/2020

## 12.13 SUGGESTED READINGS


1. "Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
2. "Gopalakrishnan", Project Management, TMH, 2007.
3. "H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.
4. "Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.
5. "Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.
6. "Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.
7. "Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.
8. "Prasanna Chandra", Project Management, TMH,2007.
9. "Chowdry", Project Management, TMH,2007.
10. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition

11. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.

12. Financial Management: I.M. Pandey.

13. Financial Management: Theory and Practices- Prasanna Chandra.

14. Financial Management: Khan and Jain.

## 12.14 TERMINAL QUESTIONS

Q1. What are mutually exclusive projects?

Q2. What are the different cash flows associated with the projects?

Q3. How cash flows differ from the profit? Explain the relevance of estimating cash flows for a project.

Q4. What do you mean by incremental cash flows? What is the process of calculating incremental cash flows?

Q5. A cosmetic company is planning to launch an Aloe Vera cream within a year. The cost of the manufacturing plant is Rs 10,00,000, installation cost shall be Rs 1,00,000 and working capital required shall be around Rs 50,000. The annual capacity of the plant is to manufacture 20,000 cream sachets. The price per cream sachet in the first year would be around Rs. 500. The variable cost to sales ratio is expected to 65%. The fixed cost per annum would be Rs 60,000 (excluding depreciation). The company calculates that the promotion cost of Rs 12000 shall also accrue in the first year. Written down depreciation rate for tax purposes is 25%. It is also estimated that working capital requirement shall be 25% of the sales. The company expects that the plant's capacity utilization over its economic life of 7 years will be as follows;

| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Capacity Utilization (%) | 40% | 40% | 50% | 75% | 100% | 100% | 100% |

The terminal value of the project is expected to be 20% of its original cost. The corporate tax rate is 30% and profit from the sale of the asset is taxed as the ordinary income. Net working capital is assumed to be released at the end of the economic life of the project.

# UNIT 13 CAPITAL BUDGETING TECHNIQUES



## 13.1 INTRODUCTION

In the previous units you learnt about the concept and importance of capital budgeting decisions. This unit basically discusses about the various techniques that will help you in valuing various project proposals. Through these techniques you would be able to know that whether an investment is worth taking or not. Since, it essential for the company to optimally utilise its resources therefore for expansion, diversification, modernisation, it is apt for the company to make critical and in-depth analysis of various alternatives available and then to choose the best among them. Hence, the main objective behind project appraisal is to maximize shareholder's wealth and thereby establishing goodwill of the company.

## 13.2 OBJECTIVES

After reading this unit you will be able to:

- Understand the various techniques for appraising projects.
- Apply discounted and non discounted techniques for appraising projects.
- Evaluate and rank various investment proposals.

## 13.3 PROJECT VALUATION

To assess the project proposals that are *prima facie* feasible and profitable, the valuation analysis is carried. The valuation analysis is based on the present data and on the basis of the projections of the returns that project may yield in the distant future. In this unit, you would learn to value projects on the basis of various techniques and hence you will be able to asses that which project is worth taking or not. Thus, these techniques will help in assessing whether the project is financially desirable or not. Before making investment in any project, it is imperative to estimate the expected returns from the project in comparison with the cash outlays. This requires that the project should be assessed and judged on the basis of cash flows expected from the project and the investment made by the firm or a company. These cash flows are assessed on the basis of investment criteria which are classified into two broad categories discounted and non-discounted.

Further, for the purposes of this unit, projects can be divided into two categories:

1. Expansion projects are the projects where companies invest in to expand their business's earnings. This could be into new products or new geographical regions or could be expansion using existing products or markets,

2. Replacement projects are the projects where companies invest in to replace old assets and maintain efficiencies. Replacement projects are taken for replacing old or damaged projects or even for undertaking projects for lowering costs.

## 13.4 CAPITAL BUDGETING TECHNIQUES

The evaluation of a project is carried out basically on three main dimensions, these are; a) Net Investment b) The Expected Cash Inflows c) The time period in which these benefits shall accrue. Further, there are various techniques of project evaluation and selections which are broadly categorized into discounted and non-discounted. DCF techniques are applied to discount the anticipated returns to a common ground using their present value (PV).

Non-discounted Cash Flow Criteria

a) Payback Period
b) Accounting Rate of Return

Discounted Cash Flow Criteria

c) Net Present Value
d) Internal Rate of Return
e) Profitability Index
f) Discounted Payback

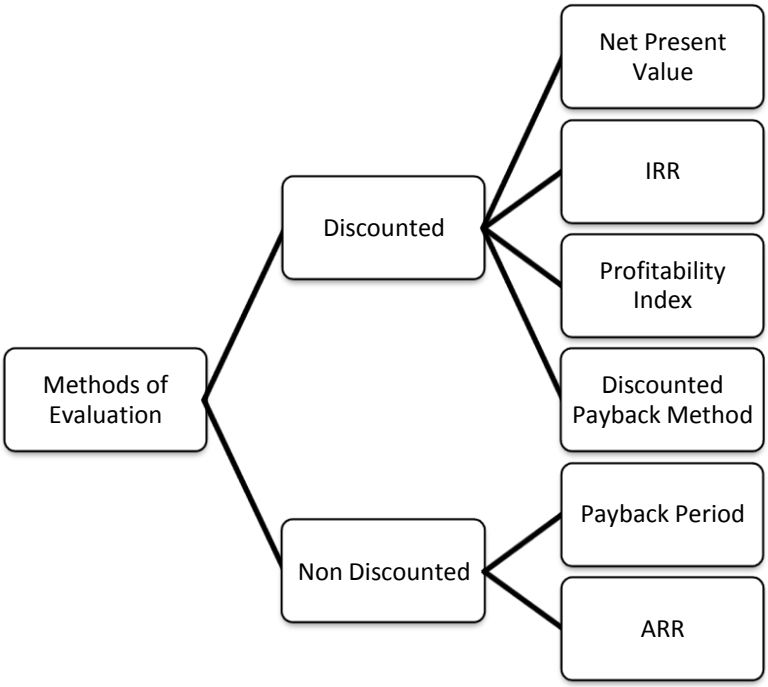



**Fig 13.1 Techniques of Capital Budgeting**

# 13.5 NON DISCOUNTED TECHNIQUES

The following are the capital budgeting techniques;

## 13.5.1 PAY BACK PERIOD METHOD

Payback period is the first screening method generally opted for selection of the project. Payback period is the number of years required to recover the funds from the cash inflows. Payback Period assesses the time period in which the initial cash flow is returned by the project. It is generally expressed in the years. At payback period cash inflows shall match the cash outflows. When two or more projects are compared than, the project with lower payback period is preferred. Further, the Payback as a decision rule for selecting the project from the various alternatives shall require an appropriate cutoff period to be decided by the company.

$$\text{Payback period} = \frac{Intial\ Investment}{Constant\ Cash\ Flows}$$

**Calculation of Payback period when annual inflows are equal**

For example a project requires an initial investment of Rs 15, 00,000 and is projected that the project shall generate cash inflows of Rs 5, 00,000 per year. For calculating payback period, the amount of initial investment shall be divided by cash inflows, therefore in the above example; the payback period shall be 3 years.

**Calculation of Payback period when annual inflows are unequal**

**Illustration 1:** Company Sunshine ltd. has to choose a project between Project X and Y. The initial investment for both the project is Rs 10, 00,000; however the following cash inflows are expected from the projects;

| Year | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Project X | 2,60,000 | 1,00,000 | 4,40,000 | 2,00,000 | 2,00,000 | 1,00,000 |
| Project Y | 3,20,000 | 2,80,000 | 1,00,000 | 1,00,000 | 3,00,000 | 1,00,000 |

**Solution**:

In the above example, the payback for Project X shall be 4 years as the sum of cash inflows of first 4 years shall be 2,60,000+1,00,000+4,40,000 + 2,00,000. For Project Y, the payback shall be computed using the following formula;

Payback= Number of years to before the full recovery+ $\frac{Unrecovered\ amount}{Cash\ flow\ during\ the\ year}$ ×12

Payback= 4+$\frac{2,00,000}{3,00,000}$ × 12 =4+8= 4 years and 8 months

Thus, in the above example, Project X shall be accepted by the company as payback period is less in case of project Y. Thus, it will return back the initial investment lesser duration as compared to project Y.

**Advantages**

1. It is simple and easy in terms of concept and application.
2. It helps in accepting only those projects which generates substantial cash flows in the initial years.
3. It helps in taking decision on the basis of liquidity of a firm.
4. Payback period is also considered as an indicator of risk as the project generating substantial cash flows in the initial years shall be generally considered as less risky as compared to the projects generating cash flows in the later years.

**Disadvantages**

1. It does not consider time value of money.
2. It ignores cash flows that accrue after the payback period.
3. It focuses more on liquidity than of profitability.
4. It does not consider the salvage value of an investment.

5. It does not state the overall liquidity position of a firm.

### 13.5.1.1 Payback Reciprocal Method

The other way of representing payback is Payback Reciprocal Method which is expressed as

Payback period Reciprocal= $\frac{1}{Payback\ period}$x100

Therefore, if a project has a payback period of 5 years, then the payback reciprocal period shall be 20%. This can be compared with the other projects and the project with the highest payback reciprocal shall be accepted.

## 13.5.2 ACCOUNTING RATE OF RETURN METHOD

Accounting Rate of Return (ARR) is the profitability of the project it shall be calculated as projected total net income divided by initial or average investment. It is also termed as average rate of return on investment, return on investment and return on capital employed .As a decision rule, the Accounting Rate of Return is compared with the ARR of the other projects and that of Industry. "ARR depicts increment in the profits due to investments by taking into account accounting profit arising from the investment as a percentage of that capital investment".(Ravi Kishore) It is method in which profitability is matched against the sum invested.

ARR=$\frac{Average\ Income}{Average\ \ Investment}$

ARR=$\frac{Average\ Profit\ after\ Tax}{Average\ book\ value\ of\ the\ investment}$

Accounting Rate of Return=$\frac{Average\ Annual\ Profit\ after\ Tax}{Average\ or\ Initial\ Investment}$x100

Average Investment=$\frac{Initial\ Investment+Salvage\ Value}{2}$

### Advantages

1. It is simple and easy in terms of concept and application.
2. Returns across the life of a project are assessed for this method therefore serves as a measure of profitability.
3. For achieving higher profitability, this method may be opted for evaluation.

**Disadvantages**

1. This method does not consider time value of money.
2. Accounting Rate of Return considers accounting profit and not cash flows; hence it cannot be used as reliable valuation method.
3. ARR is compared with some benchmark or some standard and this standard is many times arbitrarily fixed on the basis of past performances or industry's average rate of return thus ARR can give dubious results in such cases.

**Illustration -2**

Company Excel Ltd is considering a new project for which the following data are given;

(Rs.)

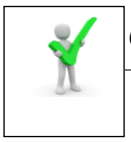
| **Details/Year** | **0** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| Investment | 2,00,000 | | | | |
| Sales Revenue | | 60,000 | 90,0000 | 80,0000 | 1,00,000 |
| Operating Expenses | | 30,000 | 20,000 | 40,000 | 50,000 |
| Depreciation | | 10,000 | 10,000 | 10,000 | 10,000 |
| Annual Income | | 50,000 | 40,000 | 40,000 | 50,000 |

Using the above data, let us calculate Accounting Rate of Return.

**Solution:**

In the above case, Average Annual Income shall be 50,000+40,000+40,000+50000/4=45,000

Further, Average Net Book value of Investment shall be 2, 00,000/2=1, 00,000. Therefore, Accounting Rate of Return shall be 45,000/1,00,000*100=45%. Excel Ltd. shall accept the project, if the benchmark or standard rate is less than 45%.



***Check Your Progress-A***

**Q1. Name the various capital budgeting techniques.**

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**Q2. 'Payback Period is a method for assessing liquidity and not profitability'. Comment**

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**Q3. How do you calculate Accounting Rate of Return?**

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**Q4. Fill in the blanks using appropriate word or words.**

a) _____ techniques should be capable enough for ranking various investment alternatives.
b) _____is the number of years required to recover the funds from the cash inflows.
c) _____ is also termed as average rate of return on investment, return on investment and return on capital employed.
d) _____are projects companies invest in to expand the business's earnings.

# 13.6 DISCOUNTED TECHNIQUES

The following are discounted techniques of capital budgeting;

## 13.6.1 NET PRESENT VALUE METHOD (NPV)

Net Present Value (NPV) is equal to sum of discounted cash inflows minus initial cash outflow . It adheres to the rule that a rupee earned today has more worth than a rupee earned after one or more years. The present values of future cash flows of a project are deducted from the initial investment to compute Net Present Value. Higher NPV is preferred and an investment is only viable if its NPV is positive.

A project will be accepted if the NPV is positive and the projects with the negative NPV shall be rejected. In case of project where NPV is exactly equal to zero then the company can be indifferent in accepting or rejecting such projects. The project with positive NPV contributes in magnifying net wealth of shareholders. While assessing mutually exclusive projects, project with higher NPV shall be selected.

Net Present Value= Present value of Cash Inflows- Initial Investment

$NPV=\sum_{t=1}^{n} \frac{C_t}{(1+k)^t} - C_0$

$NPV= \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \ldots\ldots\ldots\ldots\ldots\ldots + \frac{C_n}{(1+r)^n} - C_0$

**Advantages**

1. It recognizes the time value of money.
2. It considers cash inflows and outflows throughout the life of a project.
3. Maximizing NPV support the objective of investment decision making that is maximization of shareholder's wealth.

**Disadvantages**

1. Calculation of NPV is at times difficult for non financial executives.
2. It is also difficult in estimating the discount rate.
3. NPV may give ambiguous results in case of mutually exclusive projects or projects with unequal lives.
4. It is expressed in absolute terms; hence it does not factor in the scale in investment.

**Properties of NPV**

1. Net Present Value of different projects can be added. For example NPV of Project X can be added with the NPV of project Y, therefore as per value additivity principle, **(Pandey I.M)** NPV of both the projects i.e. NPV (Project X and Project Y) shall be equal to NPV of Project X + NPV of Project Y
2. The cash flows that occur between the initial investment and end of the project get reinvested at the discount rate.
3. NPV can be calculated when there are changes in the discount rate from one period to another.

Hence, if a company invests in the proposal with negative NPV or 0 NPV then the proposal shall not contribute to the shareholder's wealth. Accordingly, NPV Technique recognizes the net contribution of a project to the shareholder's wealth maximization.

**Illustration-3**

To illustrate the computation of NPV, consider a company Indian Star Ltd. which is comparing the two Project Alternatives A and B and the company is in dilemma regarding the acceptance of any one project. They wanted to finalise the project alternative using net present value of the two projects. The discount rate of the company is 10%.

| | Project A | Project B |
|---|---|---|
| Initial Investment | 30,000 | 40,000 |
| Estimated Life | 5 Years | 5 Years |

The Profits before Depreciation and After Taxes (Cash flows) are as follows;

| Years | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Project A | Rs. 7,000 | Rs. 12,000 | Rs. 12,000 | Rs. 5,000 | Rs. 4,000 |
| Project B | Rs.22,000 | Rs.12,000 | Rs. 7,000 | Rs. 5,000 | Rs. 4,000 |

**Solution:**

The net present value for Project X can be calculated by using present value table (Annexed at the end of the last block).

$$NPV_A=\frac{Rs7,000}{(1+.10)^1}+\frac{Rs12,000}{(1+.10)^2}+\frac{Rs12,000}{(1+.10)^3}+\frac{Rs5,000}{(1+.10)^4}+\frac{Rs4,000}{(1+.10)^5}-Rs.30,000$$

$$NPV_B=\frac{Rs22,000}{(1+.10)^1}+\frac{Rs12,000}{(1+.10)^2}+\frac{Rs7,000}{(1+.10)^3}+\frac{Rs5,000}{(1+.10)^4}+\frac{Rs4,000}{(1+.10)^5}-Rs.40,000$$

$NPV_A$ =Rs7,000($PVF_{1,.10}$)+ Rs12,000($PVF_{2,.10}$)+ Rs12,000($PVF_{3,.10}$)+ Rs5,000($PVF_{4,.10}$)+ Rs4,000($PVF_{5,.10}$)

$NPV_B$ = Rs22,000($PVF_{1,.10}$)+ Rs12,000($PVF_{2,.10}$)+ Rs7,000($PVF_{3,.10}$)+ Rs5,000($PVF_{4,.10}$)+ Rs4,000($PVF_{5,.10}$)

$NPV_A$ =Rs7,000 ×.909+ Rs12,000×.826+ Rs12,000×.751+ Rs5,000×.683+ Rs4,000×.621-Rs.30,000 = 6363+9912+9012+3415+2484-30,000
= Rs.31186-Rs30,000 = Rs.1,186

$NPV_B$ = Rs22,000×.909+ Rs12,000×.826+ Rs7,000×.751+ Rs5,000×.683+ Rs4,000×.621-Rs40,000 =19998+9912+5257+3415+2484-Rs40,000=Rs.41066-Rs40,000=Rs.1,066

Project A's Net Present Value of Cash Inflows is greater than the Net Present Value of Project B therefore, Project A shall add more wealth to the shareholders, hence Project A should be accepted.

## 13.6.2 INTERNAL RATE OF RETURN

Internal Rate of Return (IRR) is the discount rate at which net present value of the project becomes zero. It is the discount rate which equates the present value of cash flows with the initial cash outlays or outflows. Under IRR, discounting rate that makes NPV zero shall be found out. If the IRR of a project is greater than its opportunity cost of capital then such projects are accepted, that means if r is greater than k (r>k) , then such projects are accepted and if IRR of a project is lower than its opportunity cost of capital then such projects shall be rejected. Further, if the IRR is equal to the opportunity cost of capital then firm may be indifferent to such projects. Such projects may be accepted depending upon the willingness of the top level management.

**Advantages**

1. It recognizes time value of money.
2. It also considers all the cash inflows and outflows that occur in the life of a project.
3. It also supports the objective of investment decision making that is maximization of shareholder's wealth.

**Disadvantages**

1. In case of mutually exclusive projects, IRR may give dubious results.
2. Vale additivity principle is not applicable in case of IRR.
3. IRR ignores benefit of economies of scale.
4. Without calculating cost of capital, the profitability capability of any project can be assessed.
5. In case of non-normal cash flow, problem of multiple IRRs may result.
6. It is very difficult to calculate because it requires tedious calculations.

**When cash flows are equal**

A company is evaluating a project proposal costing Rs. 2, 00,000. The annual cash inflows are expected to be Rs 50,000. To calculate the IRR for equal cash flows, first of all an approximation shall be made with reference to payback period. In the above example it shall be 4 years, and then you have to find the value nearest 4 in the $6^{th}$ year row of the PVAF table. The nearest figure to 4 are given in 12% (4.111) and the 13% (3.998). Thus IRR will lie between 12% and 13%. The NPV shall be calculated using both the rates;

**NPV using 12%=(50000×4.111)-2,00,000=5550**

**NPV using 13%=(50,000×3.998)-2,00,000=-100**

The rate shall be computed at which NPV shall be zero which will lie in between of 12 % and 13%. At 12%, the NPV is Rs 5550 which is positive and NPV at 13% shall be (-Rs.100), therefore the following formula shall be used for computation;

IRR= Lower Discount Rate+$\frac{NPV\ at\ Lower\ discount\ rate}{NPV\ at\ Lower\ discount\ rate+\ NPV\ at\ the\ Higher\ discount\ rate*}$(Higher Discount Rate-Lower Discount Rate)

**= 12%+$\frac{5550}{5650}$ × (13-12)=12.98%**

**Note: *You need to ignore negative sign while adding NPV at the Higher discount rate to the NPV at the Lower discount rate. Else you can write as** $NPV\ at\ Lower\ discount\ rat - (-\ NPV\ at\ the\ Higher\ discount\ rate)$

**When cash flows are unequal**

The initial outlay for the project is Rs 2, 00,000 and project is expected to generate cash flows of Rs 60,000, Rs 80,000, Rs 70,000 and Rs 60,000 in next four years respectively. First of all weighted average of cash flows shall be computed

| Year | Cash Inflow | Weights | Cash Inflows X Weights |
|---|---|---|---|
| 1 | 60,000 | 4 | 240000 |
| 2 | 80,000 | 3 | 240000 |
| 3 | 70,000 | 2 | 140000 |
| 4 | 60,000 | 1 | 60000 |
| | | 10 | 6,80,000 |

Weights shall be given in reverse order

Weighted Average=680000/10 = Rs 68000 Now, calculate payback period using weighted average cash flows

The payback period using weighted average shall be 2,00,000/68000=2.9411

On the basis of the above, an approximation shall be made with reference to payback period. You have to find the value nearest 2.9411 in the PVAF table. The nearest figure to 2.9411 are given in 13% (2.974) and the 14% (2.914). Thus IRR will lie between 13% and 14%. The NPV shall be calculated using both the rates

| Year | Cash Inflow | PV of cash inflows using 13% | PV of cash inflows using 14% |
|---|---|---|---|
| 1 | 60,000 | =60000x.885 | =60000x.877 |

| | | | |
|---|---|---|---|
| 2 | 80,000 | =80,000x.783 | =80,000x.769 |
| 3 | 70,000 | =70,000x.693 | =70,000x.675 |
| 4 | 60,000 | =60,000X.613 | =60,000X.592 |

NPV at 13%=1030

NPV at 14%=(-)3090

**As of above, the IRR shall be computed using interpolation**

IRR= Lower Discount Rate+$\frac{NPV\ at\ Lower\ discount\ rate}{NPV\ at\ Lower\ discount\ rate+\ NPV\ at\ the\ Higher\ discount\ rate}$(Higher Discount Rate-Lower Discount Rate)

**= 14%+$\frac{1030}{4120}$ × (14-13)=14.25%**

### 13.6.2.1Modified Internal Rate of Return

MIRR is a concept which assumes that the reinvestment of intermittent cash flow would occur at a rate equivalent to cost of capital of the firm (instead at a rate equivalent to IRR, according to implicit assumption of IRR). It assumes that all intervening cash inflows that occur during the life of a project are reinvested at a rate equal to the required rate of return for the rest of the life of a project. The total cumulative values of all cash inflows are the n discounted back to be equal to the present value of all cash outflows. The rate of discount which makes Present value of cash inflows equal to present value of total cumulative cash inflows is termed as MIRR(Rustagi, 2011).. Hence MIRR can be calculated as;

=Cumulative Terminal Value of all Inflows/ $(1+MIRR)^n$

Or = $\sum_{i=0}^{n} \frac{COF_i}{(1+k)^i} = \sum_{i=1}^{n} \frac{Cash\ Inflows_i(1+k)^{n-i}}{(1+MIRR)^n}$

COF= Cash outflow in $i^{th}$ year

k= required Rate of return

n=Life of the project

MIRR=Modified Internal Rate of Return

The projects where MIRR is greater or equal to minimum acceptable rate of return then such projects shall be accepted and the projects less than minimum acceptable rate of return shall be rejected.

## 13.6.3 PROFITABILITY INDEX

Profitability Index is a technique which is an extension of Net Present Value Method. It is also known as Benefit Cost Ratio or Preset value Index.

In this method present value of cash inflows are divided by initial investment or cash outlays.

Profitability Index (PI) = $\frac{Present\ Value\ of\ cash\ inflows}{Initial\ Invetsment\ or\ Initial\ cash\ outlays}$

$=\sum_{t=1}^{n} \frac{C_t}{(1+k)^t} \div C_0$

The project having Profitability Index greater than one shall be accepted whereas project with PI less than 1 shall be rejected. Further, the projects with PI equal to 1 may be accepted or rejected depending upon other factors influencing capital budgeting decisions. In case of mutually exclusive projects, projects with highest profitability index shall be accepted.

**Advantages**

1. It consider time value of money while evaluating projects
2. It matches with the core objective of shareholder wealth maximization.
3. It is reactive assessment of profitability of a project.

**Disadvantages**

1. In some situations NPV and PI may give contradictory decisions.
2. This method cannot be used for the projects which require Initial investment for more than one year.
3. Estimation of discount rate is difficult for NPV as well as for Profitability Index method.

Taking the example of Company Indian Star Ltd., the Profitability Index of Project A and Project B shall be computed as below;

Profitability Index of Project A= $\frac{Rs7{,}000}{(1+.10)^1}+\frac{Rs12{,}000}{(1+.10)^2}+\frac{Rs12{,}000}{(1+.10)^3}+\frac{Rs5{,}000}{(1+.10)^4}+\frac{Rs4{,}000}{(1+.10)^5} \div Rs.30{,}000$

Profitability Index of Project B =$\frac{Rs22{,}000}{(1+.10)^1}+\frac{Rs12{,}000}{(1+.10)^2}+\frac{Rs7{,}000}{(1+.10)^3}+\frac{Rs5{,}000}{(1+.10)^4}+\frac{Rs4{,}000}{(1+.10)^5} \div Rs.40{,}000$

$PI_{A=}$ Rs7,000 ×.909+ Rs12,000×.826+ Rs12,000×.751+ Rs5,000×.683+ Rs4,000×.621÷Rs.30,000=6363+9912+9012+3415+2484÷30,000=1.04

$PI_{B=}$Rs22,000×.909+ Rs12,000×.826+ Rs7,000×.751+ Rs5,000×.683+ Rs4,000×.621÷Rs 40,000=19998+9912+5257+3415+2484÷Rs40,000=Rs.41066÷Rs40,000=1.03

As per the acceptance rule of PI, both the projects yield profitability index greater than one. Therefore, as per the rule both the projects may be accepted. However, Project A's Profitability Index is slightly greater than Profitability Index of Project B. Therefore, keeping all other factors as constant, project A can be accepted.

## 13.6.4 DISCOUNTED PAYBACK METHOD

Discounted Payback Method considers time value of money while calculating payback period. In this method all cash flows are first discounted using present values. These present values are then compared with initial investment in order to assess till which year initial investment shall be recovered. This method takes into account main drawback of payback period, however it does not take into account those cash inflows that occur after the payback period.

In the above example as of Company Indian Star Ltd., if the decision is based on discounted payback period, then the following steps may be used for selecting the project;

Discounted Payback of Project A =

Present Value in Year 1 Rs7,000 ×.909=6363

Present Value in Year 2 Rs12,000×.826=9912

Present Value in Year 3 Rs12,000×.751=9012

Present Value in Year 4Rs5,000×.683=3415and

Present Value in Year 5 Rs4,000×.621=2484

$DPB_A$=4 Years $+\frac{1298}{2484} \times 12 = 4 + 6.2$ =4 years and 6 months

Discounted Payback of Project B =

Present Value in Year 1 Rs22,000 ×.909=19998

Present Value in Year 2 Rs12,000×.826=9912

Present Value in Year 3 Rs7,000×.751=5257

Present Value in Year 4Rs5,000×.683=3415 and

Present Value in Year 5 Rs4,000×.621=2484

$DPB_A$=4 Years $+\frac{1418}{2484} \times 12 = 4 + 6.8$ =4 years and 7 months

As per discounted payback also, Project A shall yield initial investment little early than Project B.

In general, NPV and IRR are mostly opted criteria for evaluating projects. They are closely related to each other and both consider time value of money. But under certain situations they may also give conflicting results. In case of projects which are conventional in nature that is the cash outflows are negative and all cash inflows are positive, NPV and IRR shall give same accept or reject decisions particularly if they are economically independent. However, in case of non conventional investments cash outflows are mingled in the cash inflows throughout the span of the Project**.(Pandey I.M)** Projects with positive net present value would have higher IRR than the required rate of return.

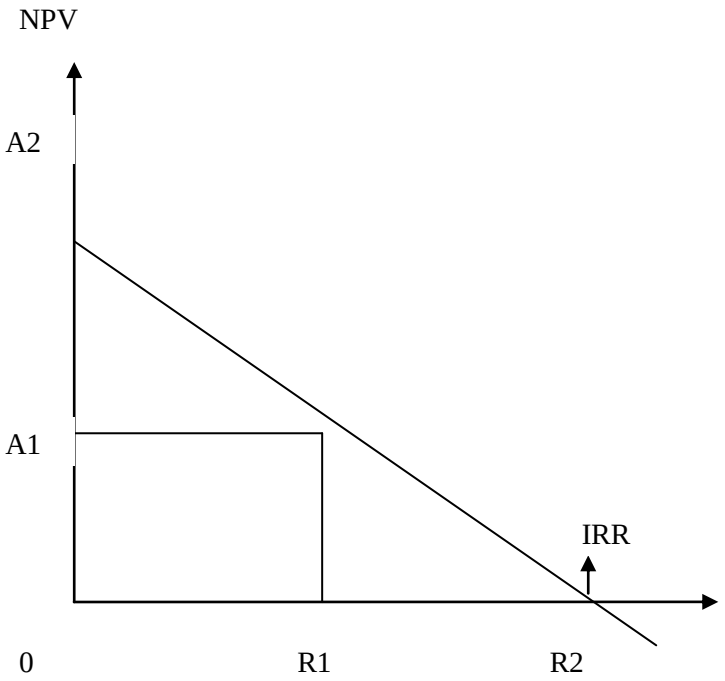


**Fig-13.2 IRR**

In the above figure-11.2 , at A2 NPV of the project is highest at zero discount rate which is difference between cash inflows and outflows. At R2 discount rate, NPV is zero and R2 is Internal Rate of Return

Further, the NPV and IRR will give conflicting ranking to the projects under the following conditions;

a) There is a difference in the cash flow pattern of the project. The cash flow of one project may increase over time and cash inflows of the other may decrease or vice versa.

b) There is a difference in initial investment.
c) There is a difference in the expected life of projects.

***Check Your Progress-B***

**Q1. Differentiate between Net Present Value and Profitability Index.**

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**Q2. What are the advantages and disadvantages of Internal Rate of Return?**

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**Q3. Fill in the Blanks with appropriate word or words.**

**a)** _____ is the profitability of the project calculated as projected total net income divided by initial or average investment.
**b)** Net present value of different projects can be _____ .
**c)** _____ is a concept which assumes that the reinvestment of intermittent cash flow would occur at a rate equivalent to cost of capital of the firm.

**Q4. While evaluating two or more projects, project giving a ——— Profitability Index would be preferred.**

a) More than one
b) Less than one
c) Equal to one
d) Equal to payback period

**Q5. Which of the following is the discount rate at which net present value of the project becomes zero?**

a) Internal Rate of Return (IRR)

b) Discount Rate
c) Cost of Capital
d) Profitability Index

## 13.7 OTHER FACTORS TO BE CONSIDERED WHILE MAKING CAPITAL BUDGETING DECISIONS

### Capital Rationing

It is a situation in which company has a limited funds and a limit is placed upon the capital expenditures during a particular period. Capital rationing refers to the selection of project proposal in a situation where constraint has been levied on the funds either external or self imposed and hence firm find it difficult to opt for the projects that yields positive NPV or projects which are acceptable as per other discounted and non discounted techniques. Kishore (2009) defines capital rationing as section of investment proposals in a situation of constraints on availability of capital funds to maximize the wealth of the company by selecting those projects which will maximize overall NPV of the Concern. Here, decision maker have to opt for any one project and remaining projects may be viable are rejected. Capital rationing may arise due to external factors when there are imperfections in the market or market information is not available regarding availability of capital. It may also arise if government has imposed some restrictions. Further, in case of internal factors, company is not interested to raise additional funds from debt or equity. It is also possible if Management of the company has fixed some arbitrarily limit as they cannot managed increased scale of operations and the likes. In such a situation, profitability index is adopted to rank the projects and choosing the optimal combination or the best project. However, PI may fail to give results in case of multi-period constraints and project indivisibility.

### Mutually Exclusive Projects

Mutually exclusive projects refer to a set of projects, from which only a single project can be accepted for implementation by a company or organization. Mutually exclusive projects are also assumed to be designed to fulfill the same task, and accordingly choosing one affects the cash availability for other projects. In mutually exclusive projects, best project is accepted; however, in some cases NPV and IRR give conflicting results. The conflict either arises due to the relative size of the project or due to the different cash flow distribution of the projects

### Risk Adjustment

A project also faces risk and therefore it should also be adjusted while valuing projects. Risk arises in the investment evaluation as it is difficult to predict about the future.

It may be adjusted with the following techniques;

a) Expected Net Present value-The expected net present value may be calculated by multiplying the cash flows by their probabilities. It adjusts for uncertainty by calculating NPVs under different scenarios and probability-weighing them to get the most likely NPV.

Expected Net Present value= Sum of Present Value of expected net cash flows

b) Risk Adjusted Discount Rate- Risk adjusted discount rate is a blend of time preference and risk preference. It is equal to Risk Free rate plus Risk premium. Accordingly, the discounted techniques shall be calculated as narrated above using the adjusted discount rate.

c) Certainty Equivalent- The Certainty Equivalent (CE) method adopts the concept of utility theory. In this approach, the decision maker must first evaluate a cash flow's risk and then specify how much money, to be received with certainty, it will make him or her indifferent between the riskless and the risky cash flows. The certainty equivalent coefficient shall be determined as under;

$$\propto = \frac{Certain\ Net\ Cash\ Flows}{Risky\ Net\ Cash\ Flow}$$

NPV shall accommodate certainty equivalent coefficient in computation;

$$\text{NPV} = \sum_{t=0}^{n} \frac{\propto_t NCF_t}{(1+k_f)^t} - C_0$$

Where,

NCF= Projections of net cash flows without risk adjustment
$\propto_t$= Certainty equivalent coefficient
$k_f$=Risk free rate assumed to be constant

## 13.8 SUMMARY

In this unit, you learnt how techniques of capital budgeting are important for project selection, expansion and replacement decisions. You also learned that it is important for a company to evaluate proposed project accurately using various methods and techniques. You also came to know about how to estimate cash flows for a project which is again an important step in evaluating project proposals. In the next unit, you will be studying about issues in Capital Budgeting Capital Rationing, Decision Tree, Stimulation, Sensitivity Analysis and CAPM methods.

## 13.9 GLOSSARY

**Payback period** is the number of years required to recover the funds from the cash inflows.

**Accounting Rate of Return (ARR)** is the profitability of the project calculated as projected total net income divided by initial or average investment.

**Initial Investment** is the cash outflows at the time of establishment of a project.

## 13.10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

Q4. Fill in the blanks using appropriate word or words.

a) Capital budgeting
b) Payback period
c) Accounting Rate of Return.
d) Expansion projects

Check Your Progress –B

Q3. Fill in the Blanks with appropriate word or words.

a) Accounting Rate of Return (ARR)
b) added.
c) MIRR

Q4. Ans-a

Q5 . Ans-a

## 13.11 REFERENCES


- Kishore Ravi M.(2009), "Chapter 12 Capital Budgeting Techniques" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 363-396

- Khan, M.Y. and Jain, P.K. (1992), "Chapter 10 Capital Budgeting I : Principles and Techniques" in Financial Management Text and Problems. New Delhi: Tata McGraw Hill Publishing Company Limited. pp 10.3-10.63
- Pandey, I.M. (2010), "Chapter 8 Capital Budgeting Decisions" in Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi, pp 141-165
- Rustagi R.P. (2011), "Chapter 7 Capital Budgeting: Techniques of Evaluation" in Financial Management- Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd.pp 204-255
- Sristava Rajiv and Mishra Anil (2016) "Chapter 11 Capital budgeting-I, Financial Management, Oxford University Press, New Delhi, pp269-295
- Van Horne, James C. and Wachowicz, John M. Jr (2009), Chapter 13vCapital budgeting Techniques", Fundamentals of Financial Management, 13th edition, Pearson Education Limited, pp 323-350


**Web Linked Referred**


- NPV, Open Textbook for HongKong, Available under Creative Commons-ShareAlike 4.0 International License, reteived from http://www.opentextbooks.org.hk/ditatopic/15785, last accessed 10/2/2020
- Kulatilaka Nalin and Marcus Alan J., Project Valuation Under Uncertainty: When Does DCF Fail?, Retrieved from http://onlinelibrary.wiley.com/wol1/doi/10.1111/j.1745-6622.1992.tb00229.x/full, last accessed 10/2/2020
- http://www.prd.uth.gr/uploads/discussion_papers/2003/uth-prd-dp-2003-17_en.pdf
- NPV vs IRR, Retrieved from http://accountingexplained.com/managerial/capital-budgeting/npv-vs-irr last accessed 10/2/2020
- What Are Mutually Exclusive Projects?, Retrieved from https://www.reference.com/business-finance/mutually-exclusive-projects-99ecf7953eeb15a8, last accessed 10/2/2020
- http://elearning.linnbenton.edu/mod/resource/view.php?id=237807


## 13.12 SUGGESTED READINGS


1. "Prasanna Chandra", Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
2. "Gopalakrishnan", Project Management, TMH, 2007.

3. "H.R.Machiraju", Introduction to Project Finance, Vikas Publications, 2005.
4. "Bhavesh.M.Patel", Project Management, Vikas Publication, 2007.
5. "Samnel.J.Montel, Jack.R.Meredith an Scott.M.Shafer Margaret .M.sutton with M.R.Gopalan", Project Management,1st edition, Wiley India, 2006.
6. "Narendra singh", Project Management Control, 4th Revised edition, Himalaya Publishing House, 2007.
7. "Narendra Singh", Problems & solutions in Project Management and Control, 3rd edition,"Himalaya Publishing House, 2007.
8. "Prasanna Chandra", Project Management, TMH,2007.
9. "Chowdry", Project Management, TMH,2007.
10. "Clifford.F.Gray, Erik.W.Larson", Project Management the Managerial Process, 3rd edition
11. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
12. Financial Management: I.M. Pandey.
13. Financial Management: Theory and Practices- Prasanna Chandra.
14. Financial Management: Khan and Jain.

## 13.13 TERMINAL QUESTIONS

Q1. How do you calculate Internal Rate of Return? What are its merits and demerits?

Q2. What do you mean by Net Present Value?

Q3. Differentiate between Net Present Value and Profitability Index.

Q4. Discuss the methods for ranking investment proposals. What are the methods commonly used for incorporating risk in capital budgeting decisions?

Q5. What are mutually exclusive projects?

Q6. X Ltd. is implementing a project with an initial capital outlay of Rs. 7,600. Its cash inflows are as follows;

| Years | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Cash Inflows | Rs. 6,000 | Rs. 2,000 | Rs. 1,000 | Rs. 5,000 |

The expected rate of return on the capital invested is 10%. Calculate the discounted payback period of the project. Present value of Re1 @10% is 0.909 for first year, 0.826 for second year, 0.751 for third year and 0.683 for fourth year and 0.621 for fifth year.

Q7. The Management of X Ltd. is considering the purchase of a new plant. Two alternatives Plants A and B are available, each costing Rs. 10, 00,000. The expected life of each Plant is 5 years. The cash flows are expected to be as follows;

| **Year** | **1** | • **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| Plant A | 2,60,000 | 1,00,000 | 5,50,000 | 3,00,000 | 2,00,000 |
| Plant B | 2,20,000 | 1,80,000 | 5,00,000 | 1,00,000 | 60,000 |

In respect of the above information calculate which Plant will be preferable using Net Present Value Method .While calculating the present values of cash flows, use a discount rate of 10%.

# UNIT 14 ISSUES IN CAPITAL BUDGETING



## 14.1 INTRODUCTION

Sometimes, a firm faces complex investment situations and has to choose among the available alternatives. In the previous unit, you have learned about the capital budgeting techniques, and so far we have assumed that the proposed investment do not involve any risk. But, in real world situation an investment project is exposed to various types of risk , uncertainty and constraints. Funds available for the projects may be limited and firm has to prioritize the project on the basis of the availability of funds and economic compulsion. In this unit you will be able to understand concept of capital rationing, selection of projects under different situations of capital rationing. You will also learn how to evaluate the project on the bases of sensitivity analysis, decision tree analysis and simulation technique. CAPM (capital asset pricing model) and the classification of risk into systematic and unsystematic risk have been discussed latter in this unit.

## 14.2 OBJECTIVES

After studying this unit, you will be able to understand the following;

- To make choices between investments under capital rationing.
- Focus on the technique of sensitivity analysis.

- Get familiar with the methodology of simulation analysis.
- Understand the decision tree approach in sequential investment decisions.
- Learn the concept of capital asset pricing model.

# 14.3 CONCEPT OF CAPITAL RATIONING

Capital allocation decisions are one of the most influential decisions in a firm's long-term financial health. Investment decisions presume vital significance since it determines the value of the firm by influencing its growth, profitability and risk. With a goal of maximizing its shareholders' value, a firm accepts all profitable projects and provide sufficient capital to utilize this opportunity. But, under capital rationing situation, a firm is unable to invest in all profitable projects as restrictions are placed on the amount of new investment to be undertaken by the firm when the supply of capital is limited. Theoretically speaking, a firm should aim to maximize shareholder's wealth by choosing profitable projects, but since the funds are made limited under capital rationing, all positive NPV projects may not be selected.

When evaluating capital investments, firm may often operate under capital constraint and faced with the possibility that the amount of capital it can devote to new investment is limited, also the cash flows of most investment project are uncertain and as such, availability of outside capital to fund these risky projects may be constrained. These capital constraints often lead to the phenomenon of capital rationing in the capital budgeting process of the firm.

Capital rationing is defined as a situation where a constraint or budgetary ceiling is placed on the total size of capital expenditures during a particular period. Capital budget is designed on the assumption that there are limited financial resources available within the firm. In capital rationing situation a company cannot undertake all positive NPV projects it has identified, because of shortage of capital. Therefore, sometimes managers are forced to let go some projects although they are viable and have positive net present value, simply because of lack of funds.

## 14.3.1FACTORS LEADING TO CAPITAL RATIONING

Sometimes due to imperfect capital market or because of some internal restrictions forced by the management, give rise to the situation of capital rationing. On this basis capital rationing can be of two types:

- ***External Capital Rationing(hard rationing)***: Imperfect capital market or sometimes due to deficiencies in market information for the availability of funds, leads to External capital rationing situations . Sometimes firm are unable to raise capital from external equity market to finance the new projects, thus leading to shortage of funds with the company. These constraints are due to imperfect equity market or can be due to restrictions imposed by government to supply the capital for investment even though the projects are profitable enough to produce the expected rate of return.

Therefore, because of these constraints by external means, firms are unable to carry out with all the projects even though they are viable or profitable.

***Reasons for external capital rationing***: There could be several reasons for this situation a) underperforming management team or bad track record of company b) new start –up firm c)restrictions imposed by lender : since most firm's rely on institutional investors and banks for its debt requirement, there can be limitations imposed by lenders upon borrowers, which affect the company's fund raising strategy. d) industry specific factors: there could be general downfall in the entire industry which could affect fund raising capacity of the individual firm .

- ***Internal Capital Rationing (soft rationing)*** :_when the management voluntarily "fixes" a certain budget at a predetermined levels and decides to restrict the use of total amount of capital by the firm , give rise to the situation of internal capital rationing. These self-imposed budgetary constraints by the managements are done to have financial control and manage the expenditure of the firm. Firm may opt for a conservative financial policy to manage the debt situations. Sometimes , the company may encourage only those investment which have lesser cost of capital , and thus by this way the restrictions imposed by the management through internal means forces firms to select only those project which will meet the managements expected rate of return and let go off some of the projects in spite being profitable and viable enough.

  ***Reasons for internal capital rationing***:_They can be as follows: A) Promoter's Decision : sometimes top management are hesitant to expand their equity share base so as not to lose controlling power over the operations of the company. B) Increase in opportunity cost of capital: too much leverage in the capital structure makes the company a riskier investment and lead to an increase in opportunity cost of capital. C) Future scenario: management is cautious in conserving some capital for some future project which might yield a higher rate of return or a decline in cost of capital.

  Whatever may be the type of restriction either (external or internal rationing) , the implications is that some of the viable and profitable projects will have to be foregone because of the shortage of funds.

## 14.3.2 SELECTION OF PROJECTS UNDER DIFFERENT SITUATION OF CAPITAL RATIONING

Needless to say, under capital rationing situation in spite of being a profitable and viable project, sometimes management has to forgo such projects and cannot accept them because of the lack of funds. Therefore, it is an important task of the management to identify not just the profitable projects but to obtain the best possible combination of profitable project with

highest NPV within the given available limit or constraint and then, they have to rank the projects in the order relative to their profitability.

**Situations of capital rationing**: some situations for which the capital rationing decisions need to be studied are as:

**14.3.2.1(a) Case 1- When divisible projects are there, and restriction or constraint is for a single period. :** (divisible projects are those projects which can be taken into parts example: construction of flats, whereas, single period rationing means, when there is capital constraints applied to the current period or for a single period only.)

Such problem can be solved by using the steps as follows:

(a) Firstly, we calculate the profitability index of each individual projects.
(b) Secondly, we will rank the projects in an order relative to their profitability index.
(c) Thirdly, choose the best possible combination of the projects.

***ILLUSTRATION 1:***

| **Project** | **Required initial investment** | **NPV of cash inflows, at the appropriate cost of capital** |
|---|---|---|
| A | 1,00,000 | 20,000 |
| B | 3,00,000 | 15,000 |
| C | 50,000 | 16,000 |
| D | 2,00,000 | 25,000 |
| E | 1,00,000 | 30,000 |

Total fund available is Rs 3,00,000. Determine the best possible combination of projects , when the given projects are divisible.

***SOLUTION :***

| Projects | Required initial outlay(Rs) **'a'** | NPV of cash inflows, at the appropriate cost of capital(Rs) | Present value of cash inflow **'b'=(outflow 'a'+ NPV)** | **Profitability index**= **(b/a)** | Rank |
|---|---|---|---|---|---|
| A | 1,00,000 | 20,000 | 1,20,000 | 1.20 | 3 |
| B | 3,00,000 | 15,000 | 3,15,000 | 1.05 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| C | 50,000 | 16,000 | 66,000 | 1.32 | 1 |
| D | 2,00,000 | 25,000 | 2,25,000 | 1.125 | 4 |
| E | 1,00,000 | 30,000 | 1,30,000 | 1.30 | 2 |

| **Rank of Investment** | **Project** | **Required initials (Rs)** |
|---|---|---|
| 1 | C | 50,000 |
| 2 | E | 1,00,000 |
| 3 | A | 1,00,000 |
| 4 | $1/4^{th}$ part of D | 50,000* |
| Total | | 3,00,000 |

- Since, all the projects cannot be selected because they cannot be accommodated as the total funds available is 3,00,000. Therefore ,after the selection of project C,E,A the remaining funds with us are (3,00,000-(50,000+1,00,000+1,00,000))= 50,000. So, $1/4^{th}$ portion of D i.e (2,00,000X1/4) to be considered and we reject project B completely since no extra funds are remaining.
  Therefore, the best possible combination of projects is C,E,A and $1/4^{th}$ of D

### 14.3.2.1(b) Case II- when indivisible projects are there and constraint or restrictions is for a single period:

(Indivisible projects are those which cannot be taken up into parts example: construction of a ship)

Such problems can be solved by using the steps as follows:

(a) Firstly , we construct a table showing the feasible combinations of the project by choosing those combination whose aggregate of initial outlay does not exceed the fund available for investment.
(b) Secondly ,we choose the best possible combination of those projects whose aggregate NPV is maximum and those project is considered the optimal project mix .

***ILLUSTRATION 2:***

Using the data from Illustration 1 , find the best possible combination of project mix , when the projects are indivisible.

***SOLUTION:***

| **Feasible** | **Total outlay** | **Aggregate of NPVs** |
|---|---|---|

| **combinations** | | |
|---|---|---|
| A,C | 1,50,000 | 36,000 |
| A,D | 3,00,000 | 45,000 |
| A,E | 2,00,000 | 50,000 |
| C,D | 2,50,000 | 41,000 |
| D,E | 3,00,000 | 55,000 |
| A,C,E | 2,50,000 | 66,000 |

By a careful examination of all the feasible combinations constructed in the above table, we will select those projects combination which have maximum or highest aggregate NPVs . Thus in the above table, the best possible combination of project mix is A,C and E because the aggregate of their NPV is maximum.

**14.3.2.1(C) Situation III: When divisible projects are there , and constraint is Multi-period :** (multi-period rationing means , when the constraints/or shortage is for more than one period.)

Under this situation , the problem of capital rationing can be solved with the help of linear programming . It is a mathematical programming approach .

## 14.4 SENSITIVITY ANALYSIS

Sensitivity analysis is a modelling procedure used in forecasting, to evaluate how sensitive the output variable is, to the change in one of the variables , while other input variables remains unchanged.

Sensitivity analysis is widely used in capital budgeting decisions to assess how the change in input variables such as sales, variable costs, fixed costs, cost of capital, initial investment , life of the project etc., will affect the output variable such as net present value (NPV) of a project, or internal rate of return (IRR). It help us to evaluate that how sensitive is the net present of a project is for a given change in one of the variables. The more sensitive the net present value of a project , the more critical is that particular variable .

***Formula :***

$$\text{Sensitivity analysis} = \frac{\text{Percentage change in output or one variable}}{\text{Percentage change in input or another variable}}$$

It helps us to understand the degree of uncertainty associated with a project , and to identify the critical factors so that further research can be carried out about such factors before accepting the project.

Let us understand the steps involved in sensitivity analysis:

- Firstly , identify all the input variables , which can have an influence on the project's NPV .
- Secondly, define the underlying relationship between the identified variables.
- Lastly, analyse the effect of the change in each of the variables it has on the net present value of the project.

Now, In order to start with this analysis , the decision maker will have to calculate the NPV of the project for each forecast under three assumptions (a) pessimistic (b) expected (c)optimistic. An "optimistic decision maker" considers the most favourable outcome in the project , whereas the "pessimistic decision maker" is very conservative in his approach.

This analysis is also known as "**what if**" analysis as it allows him to ask "what if" question. For example : **what** (is going to be the NPV) **if** volume increases or decreases ?**What** (will be the change in NPV ) **if** the project cost (fixed or variable ) increases or decreases?

Let us consider an example:

**ILLUSTRATION 3:**

Cash flow forecast for 'XYZ' flour mill project :

*Table 1:*

| | Year 0 | Year 1-12 |
|---|---|---|
| Investment | -5400 | |
| Sales | | 16,000 |
| Variable cost | | 12,800 |
| Fixed cost | | 2000 |
| Depreciation | | 450 |
| Pre tax profit | | 750 |
| Taxes | | 300 |
| Profit after tax | | 450 |
| Operating cash flow | | 900 |
| Net cash flow | -5400 | 900 |

Finance manager is considering to setup a new project costing 5,40,0000 as Initial Investment . The expected values of all the variables are given in the table above.

Expected cash flow from a new project (with 8% cost of capital ) and 40% Average tax rate, variable cost are 80% of sales and all numbers in (Rs'000).

*Table 2. Forecast under different Assumptions :*

| Range | | | |
|---|---|---|---|
| Variables | Pessimistic | Expected | Optimistic |
| Sales | 14,000 | 16,000 | 18,000 |
| Fixed cost | 2500 | 2000 | 1500 |

**SOLUTION:**

Since the cash flow from operation is an annuity, the NPV of the flour mill project is :

NPV = Present value of cash inflows(PVCIF) – Present value of cash outflow(PVCOF).

= 900,000 X PVFA(8%,12yrs) – 5400,000

= (900,000x7.536)-5400000 = 1382400.

Since, the NPV of the project looks positive. The underlying variables can vary widely and hence we would like to explore the effects of such variations on NPV. We will define the optimistic and pessimistic estimates for the underlying variables. The following data for the pessimistic and optimistic values for sale and fixed cost are given in Table 2 in the question itself.

We will calculate the optimistic and pessimistic values of each variables as:

1. ***Calculation of Sensitivity Analysis: 'when change in sales is taken'***
   a) Pessimistic case: Given sales 14,000, (cost of capital = 8%, average tax rate 40%, Variable Cost are a constant 80% of sales, all numbers in '000).

| Pessimistic case | Year 0 | Year 1-12 |
|---|---|---|
| Investment | -5400 | |
| Sales | | 14,000 |
| Variable cost | | 11,200* |
| Fixed cost | | 2000 |
| Depreciation | | 450 |
| Pre – tax profit | | 350 |
| Taxes | | 140** |

| | | |
|---|---|---|
| PAT | | 210 |
| Operating cash flow | | 660 |
| Net Cash Flow | -5400 | 660 |

*Variable cost = 80% of 14,000 = 11,200.

** Tax= 40%of Pretax profit = 40/100x350=140

NPV= PVOCI-PVCOF = 660XPVFA(8%,12yrs) – 5400

=660X7.536 – 5400 = -426.

b) **Optimistic case:** Given sales 18,000, (cost of capital = 8%, average tax rate 40%, Variable Cost are a constant 80% of sales, all numbers in '000).

| Optimistic case | Year 0 | Year 1-12 |
|---|---|---|
| Investment | -5400 | |
| Sales | | 18000 |
| Variable cost | | (14,400)* |
| Fixed cost | | (2000) |
| Depreciation | | (450) |
| Pretax profit | | 1,150 |
| Taxes | | (460)** |
| Profit after tax | | 690 |
| Operating cash flow | | 1,140 |
| Net cash flow | -5400 | 1,140 |

*****V.c = 80% of 18,000= 14,400. **Tax= 40%of 1150 = 460.

NPV = (1140X7.536)-5400 = 3191.04

***2. Calculation of Sensitivity analysis : For changing fixed cost :***

a) Pessimistic Case : Fixed cost = 2500

| Pessimistic Case | Year 0 | Year 1-12 |
|---|---|---|
| Investment | -5400 | |
| Sales | | 16000 |

| | | |
|---|---|---|
| Variable costs | | (12,800) |
| Fixed cost | | (2500) |
| Depreciation | | (450) |
| Pretax profit | | 250 |
| Taxes | | (100)* |
| Profit after tax | | 150 |
| Operating cash flow | | 600 |
| Net cash flow | -5400 | 600 |

- Tax = 40%of 250= 100.
  NPV = 600X PVFA (8%,12) – 5400 = -878.

b) Optimistic case : fixed cost = 1500

| Optimistic case | Year 0 | Year 1-12 |
|---|---|---|
| Investment | -5400 | |
| Sales | | 16000 |
| Variables cost | | (12800) |
| Fixed cost | | (1500) |
| Depreciation | | (450) |
| Pretax profit | | 1250 |
| Taxes | | (500)* |
| Profit after tax | | 750 |
| Operating cash flow | | 1200 |
| Net cash flow | -5400 | 1200 |

*tax= 40%of 1250= 500
NPV = 1200x PVFA (8%,12) -5400= +3643.

Table above shows project NPV when each variables is set to its pessimistic, expected and optimistic value. If the sales is decreased by 12.5%(i.e to 14,000), then NPV of the project becomes negative (-426) , similarly , if fixed cost is increased by 25% , NPV is negative (-878). Therefore the effect of variations in values can be analysed.

# 14.5 DECISION TREE ANALYSIS

So far we have discussed about the simple accept or reject decisions for a particular current investments. But in practice, the present decision may have an implications for future investment decisions and can also affect future events and decision making . Such complicated investment decisions requires a sequence of decision making over the time period . An analytical technique to handle the sequential decision is to use decision trees.

Decision tree is a graphical presentation of a decision making situation. It represents the relationship between a present decision and the future events, future decisions and their consequences. The events are plotted over time in an arrangement similar to the branches of a tree. The decision tree is constructed from left to right. The branches represent the possible alternative decisions which could be made.

- The "decision points" also called "decision nodes" (typically represented by 'square')

  = 

  From which the alternatives options will come out.

- The "chance point" also called "chance events" (typically represented by 'circles')

  = 

From which certain outcome like high demand , low demand or success or failure will come out.

## 14.5.1 STEPS IN DECISION TREE APPROACH:

While constructing and using decision tree, some important steps should be considered:

- Define investments: The investment proposal should be well defined. The proposal may be to enter into a new market or it can be for a new product development.
- Identify all the decision alternatives available: The decision alternatives should be clearly identified. For example , if the company is building a new plant then , it may construct a large plant, medium – size plant or a small plant, or and it may go for expansion later on or it might construct no plant at all.
- Draw a decision tree: the decision tree should display the decision points, chance events and other data.
- Analyse data: The results should be analysed and the best alternative should be selected.

**ILLUSTRATION 4:**

A Garment factory that specialized in handwoven sarees , is having a substantial backlog and for this, the firm's management is considering three courses of action , the correct choice depends largely upon the demand in future , which due to uncertainty can be low, medium or high.

Show this decision situation in the form of decision tree and indicate the most preferred decision and its corresponding expected value.

Where, S1= sub-contracting, S2= Begin-overtime, S3= construct new facility.

| **Demand** | **Probability** | **Course of Action** | | |
|---|---|---|---|---|
| | | **S1** | **S2** | **S3** |
| **Low** | 0.10 | 10 | -20 | -150 |
| **Medium** | 0.50 | 50 | 60 | 20 |
| **High** | 0.40 | 50 | 100 | 200 |

**SOLUTION :**

Steps involved: 1) Calculate the Expected Monetary Value using probability.

2) Draw the Decision Tree Diagram.

3) Select the best alternative among the following.

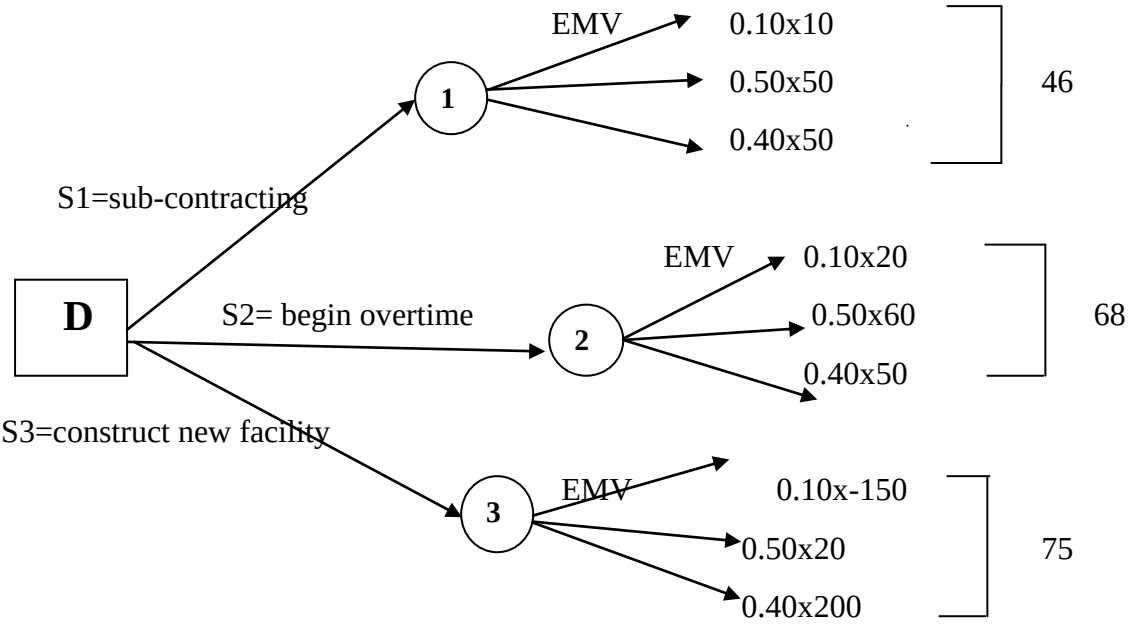
1) EMV(S1) = 0.10(10)+ 0.50(50)+0.40(50)= 46.

EMV(S2)= 0.10(-20)+0.5(60)+0.4(100)= 68.

EMV(S3)= 0.10(-150)+0.5 (20)+0.4(200) = 75.

Therefore , alternative S3 which has highest EMV is selected.

2) **Graphical Representation of decision tree:**



As per the decision tree analysis, alternative S3, which means 'construct the new facility' is selected as it has the highest NPV.

### 14.5.2 USEFULNESS OF DECISION TREE APPROACH:

This method of analysis is very useful in handling the sequential investments. With the help of this method we are able to eliminate unprofitable branches and can determine the optimum decision at various decision points. Following are the merit of this method:

- Decisions on whether to continue the project or not can be made in a well defined stages.
- Clarity: it brings out the implicit assumptions and calculations for all to see, question and revise back the decisions.
- Graphic visualization: it allows a decision maker to visualize assumptions and alternatives in a graphic form, which is usually much easier to understand than te more abstract, analytical form.
- The probabilities and the cash flow associated with the outcomes are specified at the beginning of the project, which means that the firm has experience of doing similar projects in the past.

However , in this analysis decision maker requires huge amount of information which sometimes becomes quite difficult to gather if the company has introduced something new (product or services) in market because when something new is launched in the market the available information for it is quite less for the analysis . It suffers from another limitation that sometimes, decision tree becomes complicated when more and more alternatives and variables are included in order to have wider future perspectives.

## 14.6 SIMULATION

Simulation means 'Imitation of the reality'. In simulation, a model is developed which has a well defined description or characteristics of a real system, and experiments are conducted with the model as the model represents the system itself. It is done for the purpose of understanding the behavior for the operation of the system.

Till now we have discussed about the sensitivity analysis, which indicate the sensitivity of the criterion (NPV, IRR etc) to the variations made in the basic factors example: if the quantity sold is decreased by 1%, other things being equal, then NPV falls by 6%. Such information is not adequate for the decision making, as the decision maker would like to know the likelihood of such occurrences, since this method does not reflect the probability by which the change in the variables occur, therefore we use the simulation technique.

Simulation is the representation of a model which will react to change in a similar way to that which is being simulated. Simulation technique is used to solve problem involving 'uncertainty'.

There are several technique of simulation, out of which 'Monte Carlo' technique is considered the very popular and easy to use technique.

This method uses 'random numbers' to solve problem which involve conditions of 'uncertainty'. It is an experiment on chance (use of probability). A computer would normally be used to build and run the model; meaningful information can be extracted only after a number of runs are done using different random numbers.

Some problems are very complex to solve with pure mathematics, so they involve random elements or risk situations that defy a practical mathematical solution. Therefore, we construct a model of a real world problem and use the trial –error approach to arrive at a reasonable solution to the problem.

***Uses:***

Simulation is basically the duplication of the original system. It can be use for a) inventory control b) financial decisions c) production scheduling d) investment analysis e) queueing problems etc.

## 14.6.1 ADVANTAGE OF SIMULATION

1. Problems that are too complex to be modelled mathematically can be solved using simulation.
2. It is microanalysis of big and complicated system by breaking it into various sub – system and studying the interface of various sub- system.
3. It forces the decision maker to clearly consider the interdependencies and the uncertainties characterizing the project.
4. A powerful technique which uses large amount of information, which would otherwise be lost.
5. It helps to identify the interactive effect of each single variables / components in order to determine which are important.

## 14.6.2 DISADVANTAGE OF SIMULATION

1. Simulation works on voluminous data, and is a costly process as well. Each simulation method is unique and the solution retrieved cannot be applied to other problems, even if the problems are similar in nature.
2. It is a complicated model, as the variables used in it are interrelated to each other and the values of the variables depend on previous time periods as well, therefore estimation of a possible relationship and the estimation of probability distribution is a difficult , expensive and time consuming task .
3. This method gives a rough approximation of the probability distribution of (NPV, IRR etc) . There is a lack of accuracy in the method, as the simulated probability distribution may be misleading when a tail of distribution is critical.

**ILLUSTRATION 5.** The financial controller of XYZ Ltd. Has drawn the following projections with probability distributions :

| Wages and salaries (Rs '000) | Probability | Raw material | Probability | Sales revenue (Rs '000) | Probability |
|---|---|---|---|---|---|
| 10-12 | 0.3 | 6-8 | 0.2 | 30-34 | 0.1 |
| 12-14 | 0.5 | 8-10 | 0.3 | 34-38 | 0.3 |
| 14-16 | 0.2 | 10-12 | 0.3 | 38-42 | 0.4 |
| | | 12-14 | 0.2 | 42-46 | 0.6 |

You are required to simulate the cashflow projection and expected cash balance at the end of the sixth month. Use the following random numbers:

| | | | | | | |
|---|---|---|---|---|---|---|
| Wages and salaries | 2 | 7 | 9 | 2 | 9 | 8 |
| Raw materials | 4 | 4 | 1 | 0 | 3 | 4 |
| Sales revenue | 0 | 6 | 6 | 8 | 0 | 2 |

**SOLUTION:**

Steps to solve :

- Estimate the probability distribution ( in this case, it is already provided in question)
- Calculate the cumulative probability distribution.
- Setting random number Intervals .
- Generating random numbers (in this case, it is already provided in question)
- Interpret the result.

**(a) Simulation of Cash flow Projection**

Random Number Allocation:

| **Wages and salaries** | | |
|---|---|---|
| Mid point (Rs'000) | Cumulative probability | Random numbers intervals |
| 11 | 0.3 | 0-2 |
| 13 | 0.8 | 3-7 |

| | | |
|---|---|---|
| 15 | 1.0 | 8-9 |

| **Raw Materials** | | |
|---|---|---|
| Mid point | Cumulative probability | Random number intervals |
| 7 | 0.2 | 0-1 |
| 9 | 0.5 | 2-4 |
| 11 | 0.8 | 5-7 |
| 13 | 1.0 | 8-9 |

| **Sale Revenue** | | |
|---|---|---|
| Mid point | Cumulative probability | Random number intervals |
| 32 | 0.1 | 0 |
| 36 | 0.4 | 1-3 |
| 40 | 0.8 | 4-7 |
| 44 | 1.0 | 8-9 |

Simulation of cash flow :
(Rs'000)

| Month | Wages and salaries (a) | Raw materials (b) | Sales revenues (c) | Fixed cost (d) | Net cash flow (opening bal =Rs 50) (e)= c-(a+b+d) | Cash balance |
|---|---|---|---|---|---|---|
| 1 | 11 | 9 | 32 | 14 | -2 | 48 |
| 2 | 13 | 9 | 40 | 14 | +4 | 52 |
| 3 | 15 | 7 | 40 | 14 | +4 | 56 |
| 4 | 11 | 7 | 44 | 14 | +12 | 68 |
| 5 | 15 | 9 | 32 | 14 | -6 | 62 |
| 6 | 15 | 9 | 36 | 14 | -2 | 60 |

From the above simulation it will be observed that there are 3 months ($2^{nd}$,$3^{rd}$,$4^{th}$ ) which have net cash outflows, the probability of net cash outflow can therefore be estimated as 3/6 = 0.5. From the above table estimated total cash balance at the end of sixth month is Rs 60,000.

**(b) Expected Value Method of Cash flow Projection**

EV of salaries and wages = (11x0.3)+(13x0.5)+(15x0.2) = 12,800.

EV of raw materials = (7x0.2)+(9x0.3)+(11x0.3)+(13x0.2)=10,000.

EV of sales revenue = (32x0.1)+(36x0.3)+(40x0.3)+(44x0.2)=34,800

Expected Net cash inflow per month = 34,800-12,800-10,000-14,000 = Rs 2000.

Expected cash balance after six month = 50,000+(2000x6) = Rs 62,000.

The difference between the two values Rs 60,000 and Rs 62,000 is due to sample errors . If more number of times the simulation process will be repeated then the mean of the balances predicted should approach the expected value more closely and more similar to each other as the number of repetition of process was increased.

## 14.7 CAPITAL ASSET PRICING MODEL (CAPM)

CAPM model was introduced by William Sharpe and John Linter , which is build upon the earlier work of Harry Markowitz on diversification and modern portfolio theory.

This model provides a framework to determine the required rate of return on an asset and describes the relationship between expected rate of return and the risk of the asset.

The model draws the attention that the risk factor in a portfolio theory is a combination of two risk i.e systematic risk and unsystematic risk (Table ). The combination of both types of risk give us the total risk .

| Total risk = Systematic risk + Unsystematic risk |
|---|

CAPM suggest that the required rate of return on security 'Ri' or 'Ke' is directly related to 'systematic risk', since it cannot be neutralized through diversification , whereas unsystematic risk can be reduced through a diversified and a balanced portfolio.

The required rate of return ('Ke' or 'Ri')as estimated by CAPM help in valuing an asset or securities , as we can compare the expected rate of return on an asset with the required rate of return and we can determine whether the assets is fairly valued, over-valued, or under-valued.

It also helps us to make an informed guess about the returns we can expect from an assets which has not yet been traded in the market.

Before moving forward, first we should understand how the risk is classified:

- ***Systematic Risk***: This risk arises out of external and uncontrollable factors. The effect in systematic risk causes the price of individual shares to move in the same direction, which is generally due to the response to economic, social and political change . Systematic risk is difficult to reduce through diversification of portfolio.

Example :

- Government changes the interest rate policy, deficit financing,
- Increase in inflation rate.
- Government relaxes the forex exchange control.

- ***Unsystematic risk :*** This risk arises out of known and controllable factors. These factors are unique and related to a firm or Industry. Unsystematic risk is the change in the price of the stock due to the factors which are particular to the stock. Unsystematic risk can be reduced or eliminated through diversification of portfolio.

Example :

- Company workers have declared strike.
- Government increases the taxes on certain raw materials
- New competitors enter the market or the company has old and obsolete technology.

**Table 14.1 : Showing systematic and unsystematic risk.**

Assumptions of CAPM :

1. Capital market are in equilibrium
2. There is no market imperfection. All the investment are infinitely divisible.
3. There are no taxes ,no interest changes , information is cost less, there is no inflation
4. Investment goals of investors are rational.
5. No transaction costs involved.
6. All investors have the same expectations about the risk and returns.
7. Investors base their portfolio investment decisions on security, its expected returns and standard deviation criteria.

Limitations of CAPM :

1. In real world assumptions made under CAPM does not hold good.
2. It is difficult to estimate the risk free return, market rate of return and risk premium.
3. CAPM is a single period model and most project available as large indivisible projects.

## 14.7.1 SML (SECURITY MARKET LINE)

In this section ,we will discuss about SML under CAPM, it demonstrate the relationship between an asset's risk and its required rate of return .SML expresses the basic theme of CAPM i.e the expected return of a security increases linearly with the risk as measured by β 'beta', which is explained latter in this section.

SML is straight line sloping upwards with an intercept at the risk-free return securities and passes through the market portfolio.

The upward slope of line indicate that greater expected return follows the higher levels of beta. i.e( more risk, more return).

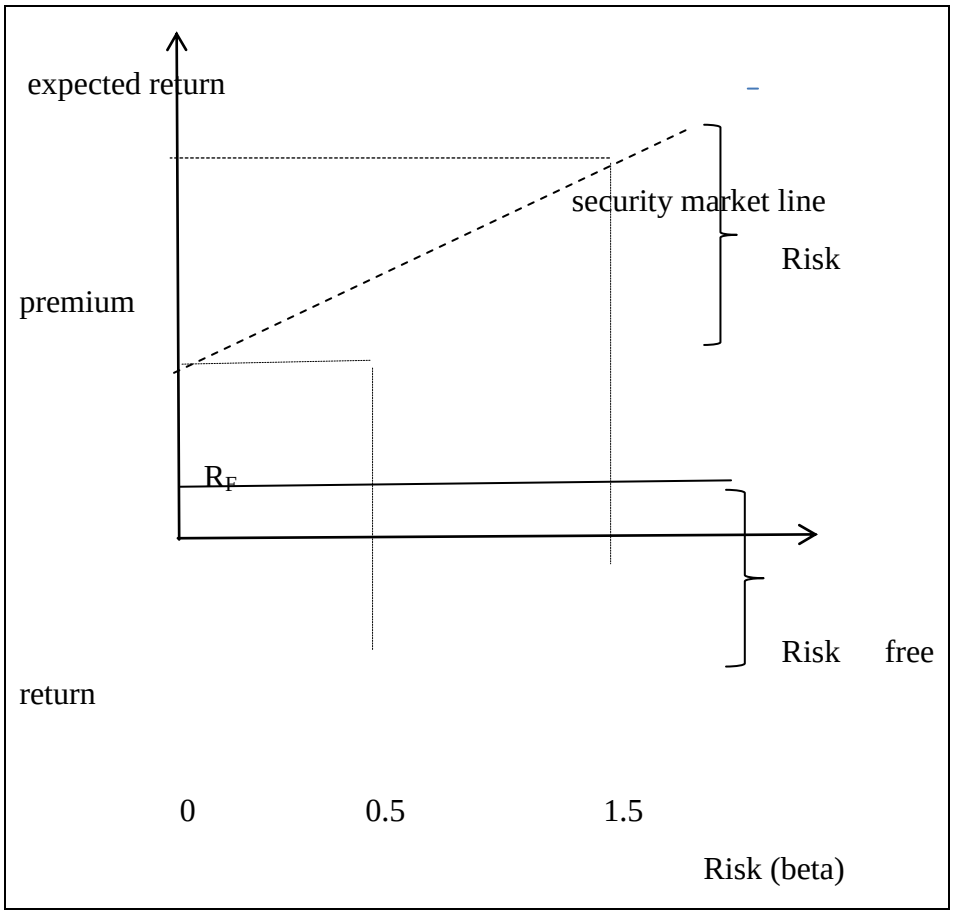



**Figure 14.2: Security Market Line Chart. Reprinted from Financial Management (p1046),by Ravi.Kishore,2009,NewDelhi,Taxmann Publication.**

The above diagram shows that the return expected from the investment made is a combination of risk free return plus risk premium.

The investors will only be interested in taking risk only if the return on investment will also include the risk premium also.

CAPM shows the risk-return relationship of an investment is given by the formula :

| $\mathbf{E(R_i) = R_f + \beta i\ (R_m - R_f)}$ |
|---|
| Expected return on security = Risk-free return + Beta of security X Market risk premium |

Where, $E(R_i)$ = Expected rate of return on security or (portfolio of security)

$R_{f=}$ risk free rate of return.

$R_{m=}$ expected rate of return.

$R_m$-$R_f$ = Risk premium or Equity market premium.

$B_i$ = 'beta' of the security, or market sensitivity of the individual security or (portfolio of security).

Beta 'β' is a measure of a security's systematic risk. The market related risk is also called 'systematic risk' and it is an unavoidable risk even after diversification, whereas unsystematic risk can be avoided by diversification of portfolio.

'Beta' factor is a measure of volatility of a systematic risk of a security. 'β' of a market as a whole is 1. A zero β means no risk.

a) A 'β = 1' indicate that the systematic risk is equal to the aggregate market risk, and the required rate of return on security will be equal to market rate of return.
b) A 'β greater than 1' means the systematic risk is greater than the aggregate market risk and the security's return are more sensitive and fluctuate more than the market return, which implies that the security's required rate of return will be more than the market rate of return.
c) A 'β less than 1' indicate that the systematic risk is lower than the aggregate market risk , and the security's return are less sensitive to the changes in the market return, which implies that security's required rate of return will be less than the market rate of return.

**ILLUSTRATION 6:**

ABC Ltd , an investment company has invested in equity share of a blue chip company, it's risk- free return ($R_f$) = 8%, expected total return ($R_m$) = 15%, market sensitivity index(β) = 1.5. Calculate expected return on security.

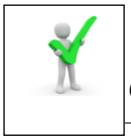
**SOLUTION :**

Total expected return ($R_m$) = 15%

Risk free return ($R_f$)= 8%

Risk premium ( $R_m - R_f$) = 7%

$E(R_i) = R_f + \beta (R_m - R_f) = 8+1.5 (15-8) = 18.5$ %.



***Check Your Progress-A***

**Fill in the blanks :**

1. The required rate of return of the project can be calculated as_____.
2. Two steps involved in capital rationing are _____and_____
3. In sensitivity analysis , the emphasis is on assessment of sensitivity of _____
4. When a firm imposes constraint on the total size of its capital budget , it is know as _____
5. Decision tree approach is used in _____decision making.
6. A risk free security has a beta equal to ____, while the market portfolio's beta is equal to _____.
7. According to CAPM , overpriced securities has a _____beta.
8. Beta is a measure of volatility of _____risk, if the beta is _____means the stock is more sensitive .
9. SML line slopes_____ and passes through___ and expected return.
10. Rigidity that affects the free flow of capital between firms causes_____.

# 14.8 SUMMARY

In this unit we have discussed about, how the firms prioritize the projects in the basis of limited availability of funds and the economic compulsion to do so. When capital is rationed there is a need to develop a method of selecting the best project with its highest possible NPV. We also learnt about the forecasting method by sensitivity analysis when the change in one input variable leads to the change in other output variables. Further, we also learnt about the steps involved in Decision Tree approach and the concept of simulation. Lastly , we discussed about the CAPM which helps us to identify the relationship between expected rate of return and the risk of an asset . Classification of risk into systematic and unsystematic risk is also discussed at the end.

## 14.9 GLOSSARY

**Expected return:** expected return of an investment or portfolio is a combination of risk free return plus a risk premium.

**Beta factor:** it is a measure of the volatility of the systematic risk of an investment in the portfolio. Beta more than 1 means stock is more sensitive than average investment.

**CAPM:** Capital asset pricing model

Expected value: the probability of occurrence of cash flow will help estimating the expected value.

**Decision tree:** a branching diagram with probabilities of different activities and the payoffs of different decisions.

## 14. 10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

1. $E(R_i) = R_f + \beta i\ (R_m - R_f)$
2. Ranking the project, selection of the most profitable investment proposal
3. NPV
4. Capital Rationing
5. sequential
6. Zero,one
7. Negative
8. systematic risk, more than 1
9. Upwards, risk free return
10. External capital rationing.

## 14.11 REFERENCES


- Kishore, Ravi. (2009). *Financial Management*. New Delhi, New Delhi: Taxmann Publication.
- Pandey, I.M.(2008). *Financial Management.* New Delhi, New Delhi: Vikas publication
- Chandra, Prasanna.(2006). *Financial Management*. New Delhi, New Delhi: Tata McGrawHill.
- Jordan & Corrado.(2005).*Fundamentals of Investments*(3rd edition). New York, New York: McGraw-Hill Irwin.
- Chandra, Prasanna.(2017). *Investment Analysis and Portfolio Management. New Delhi,* New Delhi: Tata McGrawHill.
- Bierman and Smidt.(2007).*The Capital Budgeting Decisions.* London. p.147 and p.152

Article :

- Sharpe, W.F. (1964), "Capital asset prices: a theory of market equilibrium under conditions of risk", Journal of Finance, Vol.19, No. 3, pp 425-42
- Fama, E. F. and French, K. R. (2004). The capital asset pricing model: Theory and evidence. Journal of Economic Perspectives, Vol. 18 (3): 25–46.

Online sources:

- http://www.accountingnotes.net/financial-management/capital-rationing-meaning-and-factors/
- https://www.nseindia.com/products/content/equities/indices/beta.htm


## 14.12 SUGGESTED READINGS


1.Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.

2.Financial Management: I.M. Pandey.

3.Financial Management: Theory and Practices- Prasanna Chandra.

4.Financial Management: Khan and Jain.

5.Corporate Financial Management: Arnold Alen, London, Pitman 1998.

6.Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.

7.Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997

8.https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-rationing/

9. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=440920

10. https://www.nseindia.com/products/content/equities/indices/beta.htm

## 14.13 TERMINAL QUESTIONS

Q1. What is capital rationing? What are the factors leading to capital rationing?

Q2. Write a short note on 'Monte –Carlo simulation'. State its advantages and disadvantages .

Q3. 'Decision tree analysis is helpful in managerial decisions' . Explain with an example.

Q4. What is sensitivity analysis in capital budgeting .

Q5 . Briefly explain capital asset pricing model and state its assumptions.

Q6. The following information is given

Risk free rate of return 8%

Expected rate of return on market portfolio 16%

Beta of security = 0.7

i) Find out the expected rate of return of the security.
ii) If another security has an expected return of 20%, what must be its beta?

# Block IV
# Current Assets Management

# UNIT 15 AN OVERVIEW OF WORKING CAPITAL MANAGEMENT



## 15.1 INTRODUCTION

The financial management function broadly covers two distinctive decision areas though related to each other, as the management of long term capital and the management of short term funds or working capital. In block 2, we have learned about the planning and management of firm's long term investments. The other aspect of financial decisions of planning and managing a firm's investment in short term funds shall be taken in this unit. Thus, the present unit deals with the management of working capital which is usually concerned with managing everyday financial activities such as collecting from customers and paying creditors to ensure firm's continued operations and avoid costly interruptions.

Working capital is an integral part of managing a business and therefore its efficient and effective management can ensure incessant earning to the business without hindering its liquidity position. Working capital can thus be viewed as the amount of capital required for the smooth and uninterrupted functioning of a business firm which constitutes procurement of

raw materials, converting them into finished goods for sale and realising cash from debtors and account receivables. Working capital decisions concerns with cash inflows and outflows that occur within a year or less and also encompasses the process of planning, organising, monitoring and controlling of current assets and current liabilities and involves deciding about the means of financing them. This unit explains the meaning, types, basic elements of working capital decision, factors affecting working capital, estimating working capital requirements and components of working capital management.

## 15.2 OBJECTIVES

After reading this unit you will be able to:

- Explain and define the meaning of Working Capital.
- Assess the importance of Working Capital.
- Understand the relationship between components of Working Capital.
- Identify the factors affecting the Working Capital requirement.
- Estimate the amount of Working Capital.
- Comprehend financial planning and management of Working Capital.
- Conversant with estimating firm's Working Capital using the operating cycle.

## 15.3 CONCEPTS OF WORKING CAPITAL

### 15.3.1 MEANING AND DEFINITION

The working capital management consists of management of short term assets of a business concern like stock, cash, marketable securities, receivables and short term obligations in the form of creditors, payables, short term loans. It indicates liquidity position of the company. In laymen terms, it is the cash needed to pay for the day to day operation of the business.

Thus, like most other financial terms the concept of working capital is used in different connotations by different writers.

"*The administration of the firm's current assets- namely, cash and marketable securities, receivables and inventory- and the financing (especially current liabilities needed) to support current assets.* *Van Horne and Wachowitz*

*"Working Capital is the amount of funds necessary to cover the cost of operating the enterprise".* *Shubin*

*"The term working capital refers to a firm's short term assets, such as inventory, and its short-term liabilities, such as money owed to suppliers'. Ross, Westerfield and Jordan*

*Working capital means current assets. Mead, Baker and Malott*

*Working Capital is the sum total of the physical working capital as already defined above and the cash deposits in hand and at bank and the net balance receivable over amounts payable at the end of the accounting year. Working capital, however, excludes unused overdraft facility, fixed deposits (irrespective of duration), advances for acquisition of fixed assets, loans and advances by proprietors and partners (irrespective of their purpose and duration), long-term loans (including interest thereon) and investments.*

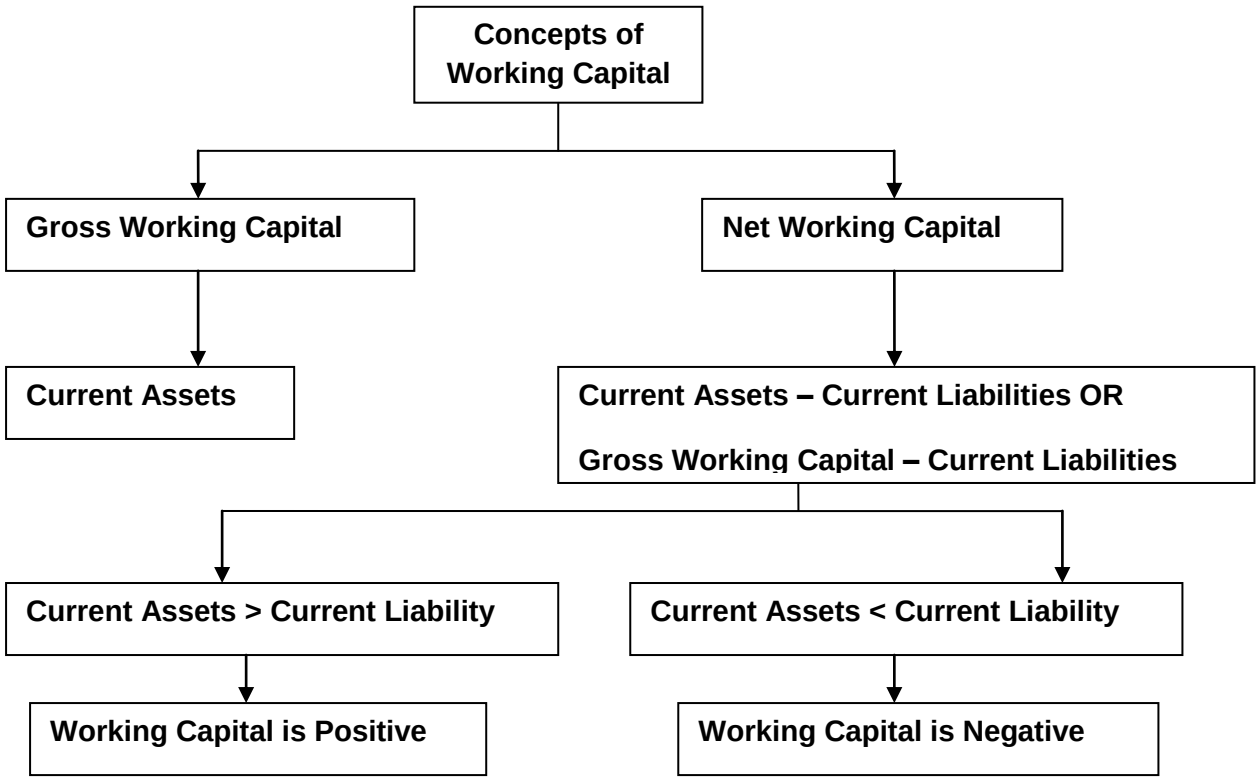
*The Annual Survey of Industries (ASI)(survey 2009-10)*

## 15.3.2 CONCEPT OF GROSS AND NET WORKING CAPITAL

Working Capital is defined in two ways therefore there are two concepts of Working Capital:

(i) Gross Working Capital.

(ii) Net Working Capital.




**Gross Working Capital:** It is total investment in the current assets.

**Net Working Capital:** It is the difference between current assets and current liability.

**Gross Working Capital-** The concept emphasises that finance manager should be concerned with the current assets as it provides the total fund for operating a company. Further, the finance manager should also know various investment avenues where idle funds can be invested for the short term for increasing profitability. Thus, your consideration should be on managing an optimum level of current assets and should avoid excessive and inadequate investment in current assets. The reason being an excessive investment in current assets or short term assets will ruin the profitability of a company whereas inadequate investment in current assets can lead to insolvency of an enterprise as it will find difficulty in meeting its short term obligations.

∴Trade-off between
- Excessive investment in Current Asset
- Inadequate investment in Current Assets

**Net Working capital:** This view denotes that company should optimize liquidity and profitability by managing individual current assets and current liability and also by managing the interrelationship between each other. Therefore it can be put up as excess of current assets over current liabilities. It is alternatively known as 'Net Current Assets'. It can be either positive or negative. If the total current assets are greater than total current liabilities then you can assess it as positive working capital and on the other hand, if the sum of all current liabilities or short term obligations is greater than short term assets or current assets then you may have a negative working capital.

## 15.3.3 TYPES OF WORKING CAPITAL

Working capital is generally divided into two types as;

i) **Permanent Working Capital or Fixed Working Capital**
ii) **Variable or Fluctuating Working Capital**

**Permanent Working Capital or Fixed Working Capital-**The minimum level of current assets maintained by a company for meeting minimum long term needs is termed as Permanent Working Capital**.** The example of Permanent Working Capital is safety stock of cash and inventories. Thus, it can also be put it as the minimum limit in current assets which is required for enduring the business operations without intrusions. This level depends on the operating cycle period of the company and the policy of the management in respect to the degree of flexibility to the production and sales.

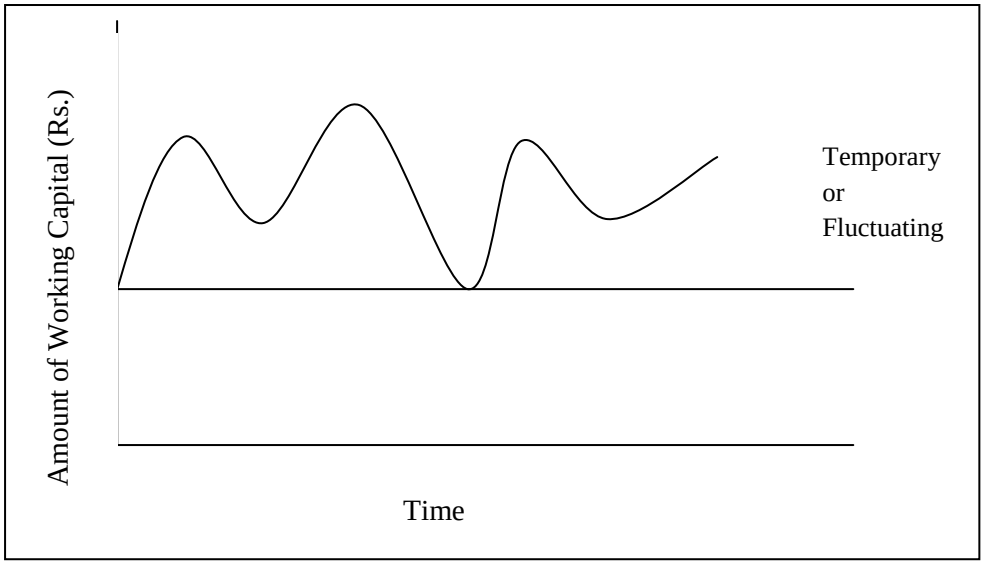
**Fluctuating or Variable Working Capital-**This is the additional working capital required to buffer for the changes in production or sales. It is the amount of current assets required over and above the minimum level and this varies according to the level of activities or operations. It is generally said as to have current assets in excess of the current liabilities as it will safeguard a company for meeting short term obligations within the ordinary operating cycle of a company. For example, woolen garment manufacturers or soft drink manufacturers are

required to maintain a larger amount in stocks in anticipation of increased sales in their season.

Traditionally, it is said that a higher level of current assets in comparison to the level of current liabilities will provide a shield against the liquidity crisis of a concern. It is a conventional rule that the company should keep twice the amount of investment in current assets *vis-à-vis* current liabilities. Further, one should also consider the quality and market value of short term assets in assessing the level of current assets in comparison with the level of current assets. Moreover, net working capital concept also helps managers in formulating policies for a judicious mix of short term and long term funds for financing current assets. Therefore, it subdivides the amount of working capital to be financed with permanent sources of funds like equity, share capital, debentures, preference share capital, retained earnings and long term loans.

Figure 15.1 denotes that permanent working capital is stable over time whereas fluctuating or temporary working capital varies with either the demand of outputs or supply of inputs. However, permanent working capital can also increase or decrease over a period of time.(Fig 15.2)

Figure 15.1 denotes that permanent working capital is stable over the time whereas fluctuating or temporary working capital varies with either the demand of outputs or supply of inputs. However, permanent working capital can also increase or decrease over a period of time.(Fig 15.2)



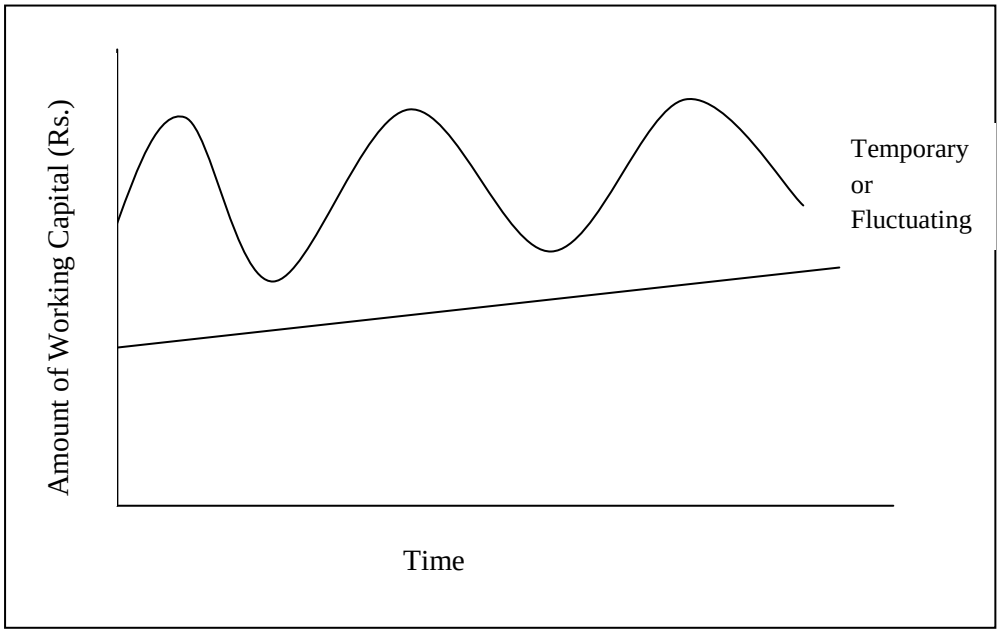



**Figure 15.1 and 15.2 Temporary and Fluctuating Working Capital***

Further, the two decisions regarding types of working are in respect of;

- Financing pattern of current assets and
- The ratio of current assets to current liabilities.

## 15.4 COMPONENTS OF WORKING CAPITAL

Broadly, working capital is composed of current assets and current liabilities.

**Current Assets**- These are those parts of total assets which are liquid in nature and are either held in form of cash or can be easily converted into cash within one accounting period. Current assets generally include-

**I) Inventories-**
- a) Stock of Raw Materials
- b) Stock of Work in Progress
- c) Stock of Finished Goods
- d) Stock of stores, spares and fuel, etc.

**II) Sundry Debtors**
- a) Debts outstanding for a period exceeding six months.
- b) Other Debts

**III) Bills Receivables**

**IV) Cash and Bank**

a) With Scheduled Banks
   i) in current account
   ii) in deposit account
b) With Non-Scheduled Banks
c) Cash and Cheque at collection centres
d) With others

**V) Marketable Securities**

**VI) Loans and Advances**

a) Bills receivables granted by scheduled banks
b) Secured loans
c) Unsecured loans
   i) Advances recoverable in cash or kind for value to be received
   ii) Deposits
   iii) Balances with customs and Excise Authorities
d) Taxes paid in advances and deducted at source

**VII) Prepaid Expenses**

**Current Liabilities**-These are the obligations of the company which are to be paid within one accounting period, usually one year.

**I) Acceptances**
**II) Sundry Creditors**
**III) Advances and deposits from customers**
**IV) Unclaimed dividend warrants**
**V) Unclaimed denture interest warrants**
**VI) Application money refundable**
**VII) Interest accrued but not due on loans**
**VIII) Hire purchase dues**
**IX) Short term loans and advances**
**X) Cash credit from banks**
**XI) Other short term payables**
**XII) Bank Overdraft**
**XIII) Provisions**

a) Provision for Taxation
b) Proposed dividends on preference and equity shares

**XIV) Bills payable**
**XV) Income received in advance**

To have better insight, let us go through the company balance sheet illustrated as under and understand how practically working capital components are included and presented.

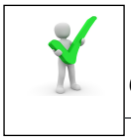
| Balance Sheet as at 31st March, 2016 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Note | As at 31st March, 2019 (Rs. In Crores) | | | As at 31st March, 2018 (Rs. In Crores) | | |
| **EQUITY AND LIABILITIES** | | | | | | | |
| **Shareholders' Funds** | | | | | | | |
| Share Capital | 1 | | 804.72 | | | 801.55 | |
| Reserves and Surplus | 2 | | 32124.28 | 32929.00 | | 29934.14 | 30735.69 |
| **Non-Current Liabilities** | | | | | | | |
| Long-term borrowings | 3 | | 25.83 | | | 38.69 | |
| Deferred tax liabilities (Net) | 4 | | 1848.42 | | | 1631.60 | |
| Other Long term liabilities | 5 | | 15.13 | | | 7.05 | |
| Long-term provisions | 6 | | 112.19 | 2001.57 | | 100.72 | 1778.06 |
| **Current Liabilities** | | | | | | | |
| Short-term borrowings | 7 | | 3.60 | | | 0.02 | |
| Trade Payables | | | | | | | |
| Total outstanding dues of micro enterprises and small enterprises | | 32.92 | | | 21.91 | | |
| | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total outstanding dues of creditors other than micro enterprises and small enterprises | | 2232.67 | 2265.59 | | 1882.71 | 1904.62 | |
| Other Current liabilities | 8 | | 4000.08 | | | 3671.18 | |
| Short-term provisions | 9 | | 8318.59 | 14587.86 | | 6106.09 | 11681.91 |
| **TOTAL** | | | | **49518.43** | | | **44195.66** |
| **ASSETS** | | | | | | | |
| **Non-Current Assets** | | | | | | | |
| Fixed assets | 10 | | | | | | |
| Tangible assets | | | 13816.77 | | | 13777.14 | |
| Intangible assets | | | 387.76 | | | 401.35 | |
| Capital work-in progress- Tangible assets | | | 2470.08 | | | 2085.49 | |
| Intangile assets under development | | | 30.75 | | | 28.65 | |
| | | | 16705.36 | | | 16292.63 | |
| Non-Current investments | 11 | | 6392.90 | | | 2441.64 | |
| Long-term loans and advances | 12 | | 2285.43 | 25383.69 | | 1506.36 | 20240.63 |
| **Current Assets** | | | | | | | |
| Current Investments | 13 | | 6461.34 | | | 5963.82 | |
| Inventories | 14 | | 8519.82 | | | 7836.76 | |
| Trade receivables | 15 | | 1686.35 | | | 1722.40 | |
| Cash and bank balances | 16 | | 6563.95 | | | 7588.61 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Short-term loans and advances | 17 | | 501.84 | | | 549.89 | |
| Other Current assets | 18 | | 401.44 | 24134.74 | | 293.55 | 23955.03 |
| **TOTAL** | | | | **49518.43** | | | **44195.66** |

**Exhibit 15.3 Balance Sheet of ITC Ltd.**

In the above Balance Sheet , you may notice Short-term borrowings, Trade Payables, Total outstanding dues of micro enterprises and small enterprises, Total outstanding dues of creditors other than the micro enterprises and small enterprises, Other current liabilities and short term provisions as current liabilities that are reflected in the ITC's Balance Sheet**.** Further, you may also notice that Current investments, Inventories, Trade Receivables, Cash and Bank Balance, Short term loans and advances and other current assets are included in the head current assets.



***Check Your Progress-A***

**Q1. Why is it necessary for you to assess working capital?**

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**Q2. What are Current Liabilities?**

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**Q3. Distinguish between**

**i) Gross Working Capital and Net Working Capital**

**ii) Permanent Working Capital and Temporary Working Capital**

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**Q5. Which concept represents excess of current assets over current liabilities?**

a) Working Capital
b) Gross Working Capital
c) Net Working Capital
d) Going Concern Concept

**Q6. Which of the following is not a current asset?**

a) Cash in hand
b) Debtors
c) Bill Payables
d) Goods on consignment

**Q7. Fill in the Blanks with appropriate word or words.**

a) Assets and liabilities of a company can be classified on the basis of duration into…… and ……. .
b) Operating assets are also called as …….
c) The total stock in a company generally comprise of ……., …….. and finished goods.

**Q8. Which of the following statements are true or false in respect to working capital?**

a) The management of current assets is a tradeoff between liquidity and profitability.
b) Net working capital is always positive.
c) Current liabilities are the liabilities raised for the purposes of current production.

## 15.5 NEED AND SIGNIFICANCE

Working capital is considered to be a backbone of a business as it plays an important role in maintaining financial health and strength during the normal business operations of a company. As we know that during the normal course of business, sales do not convert into cash instantaneously. There is always a time gap between the sale of product and receipt of cash. Working capital is required for this period to support and sustain the process of production and sales activity.

Imagine you run a manufacturing company; you will need to invest your money in two types of assets. One is an investment in machinery, land, building which is termed as fixed assets whereas , the other is an investment in operating assets, namely assets enclosed by one operating cycle. These operating assets are also known as ‘working capital’. Thus, adequate working capital is needed to sustain the sales, purchase raw materials, pay wages, and other

expenses required for manufacturing the goods / products to be sold. After realizing that you need working capital to support day to day as well as the smooth functioning of a company, you will also recognize the fact that a company faces the uncertainty of demand, price, quality, availability of raw materials its products and those of suppliers, therefore it would be necessary for you to judge and decide the amount of investment in working capital so that it meets the needs of forecasted sales as well as to have a buffer in form of safety stocks to meet unforeseen contingencies. Hence you have to also understand that the working capital needs of the firm can be fluctuating with the changing business activity or may be same throughout the year. Thus as a manager, you have to initiate timely action and correct imbalances due to change in business operations.

Therefore, it can be stated in a nutshell that working capital is needed to run the day to day functioning of business. No business firm can work or succeed without sufficient working capital In other words, to run the business, liquid surplus (current assets-current liabilities) is always needed and this difference of current assets and current liabilities which is termed as liquidity surplus by various authors is called as working capital gap and this gap can be identified by finding out operating cycle, which sometimes termed as heart of the need for working capital.

## 15.6 OPERATING CYCLE

Operating cycle denotes the continuous flow from cash to suppliers, to inventory, to accounts receivables and back into cash. Thus, it is the time period required to convert sales after the conversion of resources into inventories and later in cash. A manufacturing firm moves through the various stages of the operating cycle, viz, carrying raw material or components in the store, carrying unfinished stocks during processing, holding finished goods until sale and average collection period before getting back cash along with profit.

The cycle commencing from holding of raw material or components and computing with finished goods production is known as 'Production Cycle'.

Thus, it can be put up in this way:-

**Raw material Conversion Period+ Work in Progress Conversion Period+ Finished Goods Conversion Period=Production Cycle**

Further, you have to offer a credit period to your customer for paying bills on account of sale. This cycle further extends finished goods holding to carrying receivables.

**Raw material Conversion Period+ Work in Progress Conversion Period+ Finished Goods Conversion Period+ Receivables Conversion Period=Gross Operating Cycle**

You also know that a company purchases raw materials and other components like tools, spares, etc. thereby giving rise to the spontaneous current liability which are account payables. Further, when the average payment period is deduced from the Gross Operating

Cycle the resultant period is known as 'Net Operating Cycle Period' or 'Operating Cycle Period'. Thus, the equation may now be written as;

**Raw material Conversion Period+ Work in Progress Conversion Period+ Finished Goods Conversion Period+ Receivables Conversion Period- Average Payable Period =Net Operating Cycle**

The cycle which now extends further beyond the stage of receivables holding period to creditor's payable period due to creditors or suppliers, is called as 'Net Operating Cycle'.

Further, if depreciation is excluded from expenses in the computation of operating cycle, the net operating cycle also results to the cash conversion cycle.

**Raw material Conversion Period+ Work in Progress Conversion Period+ Finished Goods Conversion Period+ Receivables Conversion Period- Average Payable Period =Cash Conversion Cycle**

It is net time gap between cash collections from the sale of the finished goods and cash payments for raw materials and other resources purchased by the company.

Step by Step calculation of the operating cycle shall be discussed later in the unit.

Thus, shorter the duration of the operating cycle period, faster will be the transformation of current assets into cash.


**Figure No. 15.4 Operating Cycle of a Manufacturing Firm**

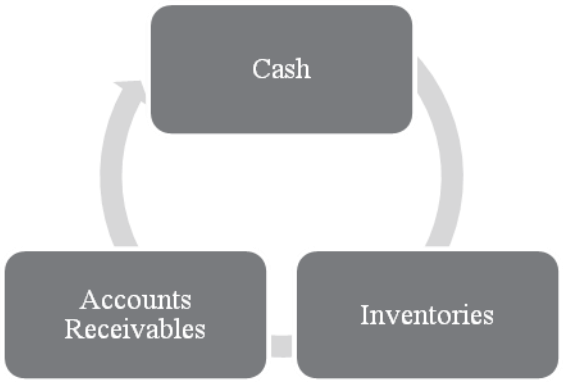



**Figure 15.5 Operating Cycle of a Trading Firm**

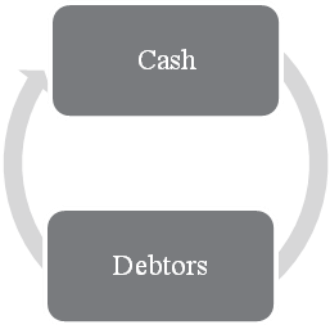



**Figure 15.6 Operating Cycle of a Financing Firm**

### Applicability of Operating Cycle Approach-

Operating Cycle is used both in controlling and forecasting working capital. It is gradually used in estimating the working capital requirement of a company to support the forecasted level of sales. Operating cycle can be compared with a yardstick or benchmark or with the corresponding figure of the industry or previous accounting year. Noticeable deviations can be identified for further analysis to seek the reason for such occurrences and, thus remedial measures can be taken to correct imbalances. Thus, operating cycle can shed light on improving the efficiency of working capital management across the years.

**Concept of Negative Cash Cycle and the Concept of Zero Working Capital**

Internet –based bookseller Amazon.com manages its cash cycle extremely well. It turns its inventory over 26 times a year, making its inventory period very short. It charges its customer's credit card when it ships a book and its gets paid by the credit card firm usually in a day. Finally, it takes about 46 days to pay the suppliers. All this mean that Amazon.com has a negative cash cycle.

Many leading companies seek to have zero (or even negative working capital). This happens when inventories and receivables are supported by the credit provided by suppliers and the advances given by customers. On average, working capitals to sales ratio is about 0.20. Reducing working capital has two financial benefit (i) every rupee released by reduced working capital makes a one-tome contribution to cash flow, and (ii) periodically , the cost of money locked in working capital is saved. Apart from the financial benefits, reducing working capital forces a company to serve its customers quickly, lessens warehousing needs, and reduces obsolescence costs.

[1.]Prasanna Chandra, 2010, 'Financial Management: Theory and Practice, Page No.663and 665 Tata Mc

**Exhibit 15.7 Concept of Negative Cash Cycle and the Concept of Zero Working Capital**

# 15.7 FACTORS AFFECTING WORKING CAPITAL REQUIREMENTS

Working capital, as we learned, is the sum of investments made in raw materials, or components, stock in progress, finished goods held in stock and value of bills unrealized on the account of credit sales. These investments of funds in working capital has a total cost viz. opportunity cost of loss of interest that would have been earned by the company if such funds had been invested in investment vehicles. Therefore, it becomes imperative for you as a manager to be careful in deciding on the amount of investment required in working capital, as working capital is termed as the lifeline of a business. But it is not an easy task to estimate the working capital requirements and to rank them because the influence on working capital components changes over the years as a company's internal policies and the environment in which it operates changes. The following factors are to be taken into consideration while making an estimate of working capital requirements of a concern-

1. **Nature of Business**-A working capital requirements of a business enterprise is to a great degree, is related to the nature and character of business it conducts. Firms engaged in trading and financing requires a large amount of funds in working capital and very small investments in fixed assets. On the contrary, manufacturing firms

would need relatively less amount of working capital and have to invest substantially in fixed or long term assets. Further, luxurious products producing companies and merchandising concerns have to carry big inventories of materials to meet customer's demand and have to grant greater credit period to attract customers, therefore, they will have to carry large amount of working capital. In contrast, public utilities concerns maintained a small working capital position because of continuous inflow of cash from their customers. Retail stores like Shopper Stop, Pantaloons, Reliance Mega Mart, Easy day and the likes must carry large stock of a variety of goods or products to satisfy varied and continuous demand of their business. Exhibit 15.8 gives highlight of relative proportions of investment in current assets and fixed assets for certain industries.

**Proportions of Current Assets and Fixed Assets**[1]

| Current Assets (%) | Fixed Assets (%) | Industries |
|---|---|---|
| 10-20 | 80-90 | Hotels and Restaurants |
| 20-30 | 70-80 | Electricity Generation and Distribution |
| 30-40 | 60-70 | Aluminum and Shipping |
| 40-50 | 50-60 | Iron and Steel, Basic Industrial Chemicals |
| 50-60 | 40-50 | Tea Plantation |
| 60-70 | 30-40 | Cotton Textiles, Sugar |
| 70-80 | 20-30 | Edible Oils, Tobacco |
| 80-90 | 10-20 | Trading and Construction |

[1.]Prasanna Chandra ,2010, ' Financial Management: Theory and Practice', Tata Mc Graw Hill Education Pvt. Ltd. , New Delhi

**Exhibit 15.8 Proportions of Current Assets and Fixed Assets in Certain Industries**

2. **Size of business**-Companies producing the same products may differ in working capital requirements because of their varying sizes i.e. turnover. A company whose turnover is small requires greater investment in cash, receivables and inventories, whereas, a company with bulky turnover requires lesser investment in cash, receivables and inventories. Further, a small firm though even growing tend to be hard-pressed in working capital financing as they cannot access to capital markets or open markets and hence have to depend upon trade credit and short term loans for meeting the current assets requirements.
3. **Market and Demand Conditions**-Relationship between volume of sales and working capital requirement is directly proportional to each other. If there is a rise in demand and also in sales then there should be a corresponding investment in inventory, finished goods and account receivable to support the enlarged scale of operations by the company. The degree of competition prevailing in the market

should also be considered before estimating working capital needs. Under the boom conditions in the economy, sales will tend to increase, to support these additional sales, firm requires massive investment in inventories and receivables and thereby additional investment in working capital is brought into the company through short term borrowing generally from banks, financial institution and by marketable securities. On the contrary, under the conditions of recession in the economy, firm squeezes its short term borrowing as sales level dips because of which firm is forced to reduce its investment in inventories and receivables**.**

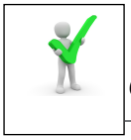
4. **Production Policies-**Level of working capital required in an enterprise depends on the speed and duration of the production cycle. For companies having extended production cycle, working capital requirements are comparatively higher as raw material introduced in the production may take a long period before it gets converted into finished goods for sale. Therefore, funds are blocked in raw material, labour expenses and overheads at the various stages of production. The process period also depends on the selection of manufacturing cycle. Therefore, a firm has to select steady or variable production policies in order to gear inventories to seasonal requirements in the demand for the firm's product. Inventories or stock of finished goods are kept to minimum levels during the off season by adopting variable production policy whereas if a steady production policy is adopted it can avoid changeability in production schedule but firm will have to bear greater inventory costs and risks. Thus, production policies will differ from firm to firm, depending on the demand requirements and intensity of seasonality of product.
5. **Competitive Position-**Competitive position of a company has an important bearing on the working capital needs. In order to combat competition, a firm may offer liberal credit terms to the customers resulting in higher debtors. Moreover, larger inventories may be maintained by the company to meet the customer's demand. However, a monopoly or monopolistic firm may have some relaxation in amount of working capital required as company can ask for advance payments from their customers**.** Therefore, when there is cut throat competition, a company has to increase its inventory level to satisfy customer's demand and to grant more liberal credit terms thereby causing increased investment in receivables.
6. **Trade Cycle-**An industry and a company undergoes different stages of business cycle i.e., boom, recession, recovery etc. these recurring movements of the business cycle influences working capital changes. In case of the boom, inflation prevails and business activities increases due to which needs for cash, inventories, etc. get amplified resulting in more blocked funds. On the contrary, during the recession, there is a reduction in business activities and therefore, there will be a fall in inventory and cash requirement. Thus, the company becomes cash poor as the economic prosperity surges and becomes cash-rich as it runs out of it.
7. **Credit Policy-** The credit policy illustrated the term and conditions on which goods are sold and purchased. The credit terms to be granted to the customer are generally governed by its industry and the demands of product by the customers. If the credit items are liberal, the amount blocked in receivables will be larger and in such cases, a

firm will be exposed to considerable amount of risk. However, in case of tight credit policy, there will be increased risk of loosening increased sales, especially, in case of intense competition. For example, in India in the 70's and 80's scooters and cars were sold on advance payment but now, if you intend to buy a scooter or a bike , you have an option of choosing from various models and companies without advance or down payment, rather sometimes sellers are willing to offer scooter on credit.

8. **Operating Efficiency-** Operating Efficiency means maximum production of goods with minimum utilization or resources and at minimum costs. Need for working capital depend on how well company deploys funds and resources, so as to optimize firm's rate of return and thus, helps in seeking advantage of balanced working capital, overall adding value to the firm. Since, it is not possible for a finance manager to predict about the changes in the price of raw material or wages or price of intermittent goods required in the production but he can certainly ensure efficient and effective utilization of resources. Further, management increasingly sophistication in handling the current assets and current liabilities will curtail the major working capital problems.
9. **Business Growth rate–**Assessment of working capital requirement is also influenced by the growth rate of a business concern. A large amount of working capital is needed if management anticipate robust growth of the concern .However, there is no clear cut rule demarcating the relationship between the growth of the company's relationship between the growth of the company's volume of production and the growth of its working but it generally follows that the increase in operations of a business concern will demand higher investment in working capital. In the nutshell, an increased volume of operations should always be supported and backed by the increased working capital. The need for puffy working capital does not contribute directly in the growth of business but it indirectly supports the growing operations of a business concern.
10. **Price Level Changes-**Inflation is indicated by the rise in the price of goods and services kindle changes on working capital requirements of the firm. Commonly, rising prices level leads to further investment in inventories, receivables and cash. During inflationary conditions companies also tends to increase their production volume as well as also accumulate inventories to reap the speculative gains, thus it forces a business to maintain larger working capital funds as compared to normal conditions of the economy. Further, magnitude of the impact of price level changes on the business differ company to company and industry to industry as some industries are badly affected by it and some may not be affected as severely.
11. **Availability of credit from suppliers-**Working capital requirements of a firm is also affected by the terms and conditions of purchase and sale. A firm, will need less working capital if liberal credit terms are available to it, In addition to it, duration and availability of credit from banks also influences the working capital needs of the firm.
12. **Dividend Policy –** The volume of working capital is also influenced by the dividend policies followed by the company and sometimes, changes in working capital may also bring about an adjustment of dividend policy. For example, these days many

companies provide ESOP (Employees Stock Option Plans) Scheme or Right Shares or Bonus shares to cover up or to avoid liquidity problems. However, if company desired to maintain stable dividend distribution in cash then accordingly it has to maintain higher amount of working capital.

13. **Degree of Seasonality-** Magnitude and form of working capital is also affected by how much a company is exposed to seasonal fluctuations. Companies that experience strong seasonal movements in demand also notice fluctuations in working capital for every change. For example, in a woolen mill, the demand will certainly be higher during the winter season and therefore, it has to build up high inventories and bigger base of receivables and subsequently additional working capital is required to maintain higher production especially before onset of winter. In India, inability to manage severe working capital fluctuations has forced companies to diversify into unrelated areas to compensate the factors of seasonality.



***Check Your Progress- B***

**Q1. Mention in your own words, what you understand by profitability and liquidity.**

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**Q2. List any five determinants of working capital.**

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**Q3. Distinguish between Operating Cycle and Cash Cycle.**

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**Q4. Generally , it is noticed that utility concerns like Indian Railways hold 10% of total assets in current assets , whereas, retail trading concerns like, shoppers stop hold 60% of total assets in current assets. Explain why or why not?**

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**Q5. Multiple Choice Questions-**

**i) Which of the following factors influence(s) the composition of working capital?**

a) Nature of business
b) Dividend Policy
c) Degree of Seasonality
d) All the above

**ii) The duration of the operating cycle can be reduced by;**

a) Increase in the time available for payments to crudities
b) Increase in the raw material storage period
c) Decrease in the work in progress period
d) Both a and c

**iii) The time between cash disbursements and cash collection is;**

a) Cash Cycle
b) Inventory Period
c) Operating Cycle
d) Accounts Payable Period

**Q6. State True or False for the statements given below-**

a) Carry of book debts by your firm will be influenced by the extent of demand that your products commands and the status it has in a competitive environment.
b) Working capital investment also has a cost attached to it.
c) Firms engaged in the same line of business activity may have different working capital requirements.
d) Excise duties on the capital equipment's effects the working capital policies of a firm.
e) Sugar mills have to carry a small reserve of working capital as they have to spend about two-third of their production expenditure in buying sugar canes.

## 15.8 ESTIMATION OF WORKING CAPITAL-

Estimation of working capital is the process of assessing as realistically as possible the quantities of raw material or components, stock in progress, finished goods inventory and bills receivables, you will need to analyze as a finance manager at any given time at such levels that will ensure smooth operations of the business.

There are different approaches available to estimate the working capital requirements of a firm. A finance manager can apply any of the following techniques for assessing the working capital requirements of a company-

1) **Operating Cycle Approach**
2) **Percent of Sales Approach**
3) **Estimation of Components of Working Capital Method.**

### 1) Operating Cycle Approach-

We have already discussed that the concept of operating cycle helps in determining the time duration required to transform current assets into cash. In nutshell, the shorter the duration of operating cycle period faster will be the transformation of current assets into cash. Operating cycle approach is the most followed and is termed as the most systematic and logical approach in working capital computation. In this method, the working capital estimation is made on the basis of analysis of each component of working capital. However, we have already learned various components of working capital, let us figure out important points to be considered while their estimation-

1) Cash and Bank Balance- Require most vigilant estimation as it is least productive of all the current assets and it also provides liquidity to a concern.
2) The number of units to be required by the Manager to stock depends on raw material consumption rate time log in procuring new stock, contingencies or buffer stock required etc.
3) The value of raw material, wages and other expenses locked up in work in process depends on the availability of technology. It may be noted that there will be different number of units in different stages of production. Therefore, for the purpose of easy and feasible computation the value of raw material blocked in W-I-P will be taken equivalent to full cost of number of units of raw material. It is also assumed generally that W-I-P units are on an average 50% complete with respect to labour and expenses.
4) Finished goods are valued on the basis of cost of units in terms of purchasing, procuring and production.
5) In case of receivables, it is better to calculate their value on the cost basis because the actual funds locked up in receivables are restricted to the cost of goods sold.
6) Creditors, for wages and expenses, are considered they have significant contribution in work in progress and finished goods but are paid usually at the end of the month.
7) Depreciation is generally not considered in working capital estimation as it is a non-cash expense and no funds are blocked in it. The working capital calculations ignoring depreciation is known as cash basis working capital whereas when in the calculations, depreciation is included in such estimate is known as total basis working capital.
8) Nature and quantum of safety margin or margin for contingency depend upon the characteristics of industry and company. It is generally expressed in terms of percentage of current assets and current liabilities.

**Step by Step calculation of the length of operating cycle is presented as below:-**

**Step1: Raw Material Conversion Period-**

RMCP= $\frac{Average\ Raw\ Material\ Stock}{Total\ Raw\ Material\ Consumption}$×365= $n_1$ days

Where, Average Raw Material Stock = $\frac{Opening\ Stock+Closing\ Stock}{2}$

**Step 2:Work in Progress Conversion Period-**

WPCP= $\frac{Average\ Work\ in\ Progress\ Stock}{Total\ Cost\ of\ Production}$×365= $n_2$ days

Where, Average W-I-P Stock = $\frac{Opening\ Stock+Closing\ Stock}{2}$

Total Cost of production=Opening Stock of W-I-P + Consumption of raw material+ Other manufacturing costs such as wages and salaries , power and fuel etc. + Depreciation- Closing stock of W-I-P

**Step 3: Finished Goods Conversion Period-**

FGCP= $\frac{Average\ Finished\ Goods}{Total\ Cost\ of\ Goods\ Sold}$×365= $n_3$ days

Where, Average Stock of Finished Goods = $\frac{Opening\ Stock+Closing\ Stock}{2}$

Total Cost of Goods Sold= Opening Stock of Finished Goods+ Cost of Production + Excise Duty+ Selling and Distribution Cost+ General Administration Costs + Financial Cost –Closing Stock of Finished Goods.

**Step 4: Average Collection Period or Debtors/Receivables Conversion Period-**

DCP= $\frac{Average\ Debtors}{Total\ Credit\ Sales}$×365= $n_4$ days

Where, Average Debtors = $\frac{Opening\ Balance+Closing\ Balance}{2}$

**Step 5: Average Payment Period Creditors /Payables Deferral Period**

CDP= $\frac{Average\ Creditors}{Total\ Credit\ Purchases}$×365= $n_5$ days

Where, Average Creditors = $\frac{Opening\ Balance+Closing\ Balance}{2}$

**From the above calculations, the gross operating cycle period is obtained as;**

**Step 6: Gross Operating Cycle= $n_1+n_2+n_3+n_4$**

**Step 7: Net Operating Cycle = $n_1+n_2+n_3+n_4 - n_5$**

**Step 8:** After completing the period of one operating cycle, the total number of operating cycles that can be completed during a year can be completed by dividing 365 with the number of operating days in a cycle .The total operating expenditure in the year when divided by the number of operating cycles in a year will give the average amount of working capital required. Let us, try to compute the working capital requirement for Diksha Pvt. Ltd. using operating cycle period approach-

| | |
|---|---|
| **Period Covered** | **365 days** |
| **Average Period of Credit allowed by suppliers** | **18 days** |
| | **(` in'000)** |
| **Average debtors outstanding** | **500** |
| **Raw Material Consumption** | **60,000** |
| **Total Production Cost** | **10,000** |
| **Total Cost of Goods Sold** | **10,500** |
| **Sales for the Year** | **20,000** |
| **Value of Average Stock Maintained:** | |
| **Raw Material** | **300** |
| **Work In Progress** | **380** |
| **Finished Goods** | **290** |

**Solution:**

**Computation of Working Capital**

1) **Raw Material Conversion Period =** $\frac{Average\ Raw\ Material\ Stock}{Total\ Raw\ Material\ Consumption}\times 365$

$= \frac{300}{6,000}\times 365 = 18$ days$=n_1$ days

2) **Work in Progress Conversion Period**= $\frac{Average\ Work\ in\ Progress\ Stock}{Total\ Cost\ of\ Production}\times 365$

$=\frac{380}{10,000}\times 365 = 14$ days$=n_2$ days

3) **Finished Goods Conversion Period**= $\frac{Average\ Finished\ Goods}{Total\ Cost\ of\ Goods\ Sold}\times 365$

$=\frac{290}{10,500}\times 365 = 10$ days$=n_3$ days

4) **Debtors Collection Period=** $\frac{Average\ Debtors}{Total\ Credit\ Sales}\times 365 = n_4$ days

$= \frac{500}{20,000} \times 365 = 9$ days $= n_4$ days

**5) Credit Payment Period** $= \frac{Average\ Creditors}{Total\ Credit\ Purchases} \times 365 = n_5$ days

$= \frac{Average\ Creditors}{Total\ Credit\ Purchases} \times 365 = n_5$ days

**∴Gross Operating Cycle $= n_1+n_2+n_3+n_4 = 51$ days**

**Net Operating Cycle $= n_1+n_2+n_3+n_4 - n_5 = 51-18 = 33$ days**

Number of Operating Cycles in a year = 365/ 33= 11

**6)** Amount of working Capital Required $= \frac{Total\ Operating\ Expenses}{Number\ of\ Operating\ Cycle}$

$= \frac{10,500}{11}$ = Rs. 955

**Tutorial Note: -** You will observe that the company has an Average Payment Period of 18 days and a collection of 9 days which gives the impression to the creditors that the company is late in paying its bills or credit. If a company can reduce its raw material storage period and work in progress conversion period, then it certainly require less amount of working capital.

☞**Words Worth Remembering-**

1. **In the above formulas, if only the closing balance is available, then it can be taken in substitute of Average balance.**
2. **365 represents number of days in a year, sometimes even one can take it as 360**
3. **In case of RMCP, WPCP,FGCP, the denominator is calculated at cost basis and the profit margin has been excluded because there is no investment in profit.**

2) **As a Percentage of Net Sales Method-** As you have learned in the previous discussion that working capital needs and the sales volume of a company are directly proportional to each other. Therefore, the higher the sales, the greater would be the need for working capital. Hence, one more method, which we can follow to compute working capital requirement is percentage of Net Sales Method. Under this method, working capital requirement is expressed in terms of percentage of expected sales for particular time period. Estimating sales is an exercise in prediction. This computation of working capital on the basis of expected sales is made logically, rationally and based on reliable data. Sales of past years are first plotted to analyze the trend in respect of sales growth and thereafter, we will then have to project and articulate the working capital requirement for the next year. We have to follow three steps in the estimation of working capital which are listed as under-

Step 1– Estimate Total Current Assets as a Percentage of Estimated Net Sales

Step 2– Estimate Current Liabilities as a Percentage of Estimated Net Sales

Step 3– Difference of Step 1 and Step 2, Net Working Capital as a Percentage of Net Sales

You will better understand this procedure, after going through the following data for ABC Company-

| **Particular (Expected)** | **Year 1** | **Year 2** | **Year 3** | **Year 4** |
|---|---|---|---|---|
| Sales | 5, 00,000 | 6, 00,000 | 7, 00,000 | 10, 40,000 |
| Percentage of Growth | 15 % | 20 % | 25% | 30 % |
| Production (in units) | 36 | 40 | 50 | |
| Total Current Assets | 80,000 | 1, 00,000 | 1, 60,000 | 1, 87,200 |
| Total Current Liability | 40,000 | 50,000 | 80,000 | 93,600 |
| Step 1 Current Assets as a % of sales | 16 % | 16.6% | 20% | 18% |
| Step 2 Current Liabilities as a % of sales | 8 % | 8.3% | 10% | 9% |

Step 3 Difference between = 18%(16+16.6+20/3)-9 %( 8+8.3+10/3)=9%

Average of Step1 and

Average of Step 2

Let project that sales of the company in Year 4 will increase by 30 % then Net Working Capital would be computed as 9% which is the difference between step1 and step 2 of Rs.10,40,000, which will be equal to Rs.93,600.Thus, this is one of the simple method of projecting working capital requirement.

**4) Working Capital as Percentage of Total Assets or Fixed Assets-**

As you learned that total assets of a firm consist of fixed asset and current assets. Now, under this approach working capital requirement is computed as a percentage of fixed assets or total assets. On the basis of past trends, and experience, a relationship between total current assets and total fixed assets or total assets is calculated.

We have to follow three steps in the estimation of working capital which are listed as under-

| Step 1– Total Current Assets/ Gross Working Capital/ Net Working Capital |
|---|

| Step 2– Total Assets or Total Fixed Assets |
|---|

**Let us try to work out the working capital requirement for XYZ Industry using the data given below;**

| **Particulars** | **Year1** | **Year 2** | **Year 3** |
|---|---|---|---|
| Total Assets | 10, 00,000 | 15, 00,000 | 20, 00,000(Expected) |
| Current Assets | 1, 00,0001, | 50,000 | 2, 00,000 (10 % of 20, 00,000) |
| Current Assets as a Percentage of Total Assets | 10% | 10% | 10% |

In the above data, company decided to increase its total assets under capital budgeting decisions to Rs.20,00,000 and it is noticed that company follows a policy of maintaining 10% of Total Assets in Current Assets , therefore, in the Year 4 company is required to keep Rs.2,00,000, worth of assets in working capital.

The major shortcoming of the last two approaches is that it is practically very difficult to establish a relationship and project about the next year sales or fixed assets on the basis of past experience.

# 15.9 WORKING CAPITAL: LIQUIDITY VS. PROFITABILITY TRADE OFF

One of the important discussions in working capital management is to keep such a balance in the working capital which can magnify profits and at the same time reduces cost. This important aspect emphasizes to determine the optimal amount of working capital which would add a positive impact on the value of the firm. A larger investment in current assets under the certainty conditions would curtail the rate of return on total assets and investments for the firm whereas smaller investment in short term assets would pose a company with the risks of stockouts, mounting payment obligations, production stoppages and lost sales from inventory shortage. It also reveals that greater investment in current assets will provide greater liquidity in making the firm's meet its payment schedules but as we learned above that it also has a cost attached to it, opportunity cost of loss of returns on idle liquid assets. So there exists a tradeoff between profitability and liquidity or tradeoff between cash crunch and cash surplus or tradeoff between risk and return with reference to working capital. In other words, the larger the amount of investment in current assets the less risky the firm will be and smaller will be the amount available for investment in various investment avenues . Thus, there is an inverse relationship between liquidity and risk of the firm with respect to working capital.

If a firm wants to increase profits by reducing the cost of maintaining liquidity, then it must also bear the risk and if it wants to decrease it, then it should also accept the decreased profitability. Therefore, a tradeoff between risk and return is important for a concern.

Another view of this risk –return tradeoff is in terms of the cost of keeping a certain level of current assets. Like most corporate financial decisions, working capital management also considers the decisions regarding cost. i.e. cost of liquidity and illiquidity. The cost of high investment in current assets which is low rates of return on idle current assets and it increases with the level of current assets. On the other hand, the cost of illiquidity is the cost of holding insufficient current assets which will adversely affect the goodwill of the firm as it will face difficulty in obtaining credit. Thus, as a finance manager, you have to balance risk and profitability or solvency and profitability by minimizing the cost of liquidity and illiquidity.

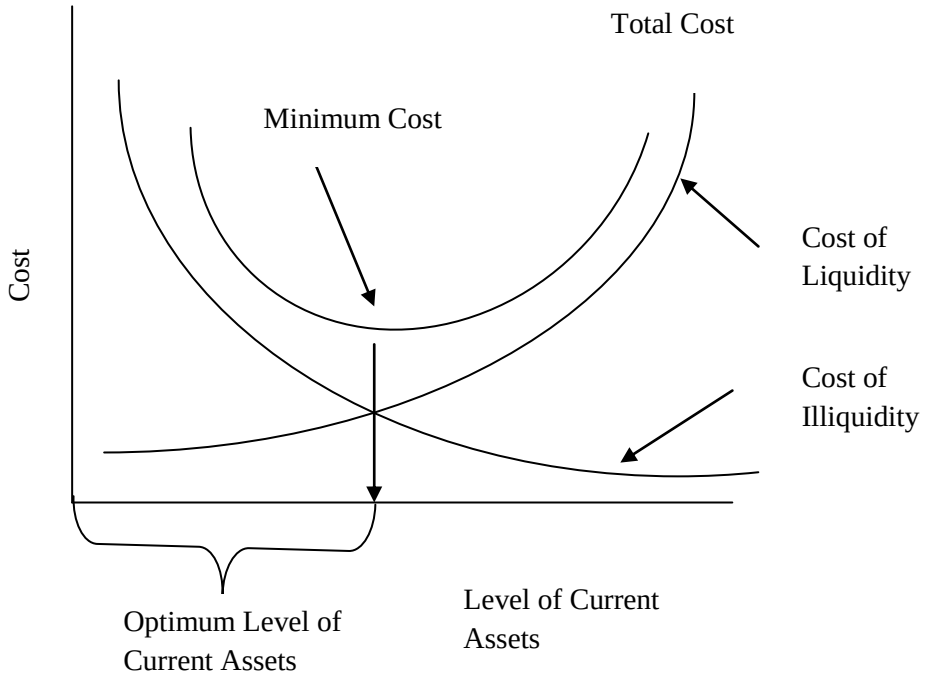



**Fig. 15.9 Cost of Liquidity and Illiquidity Trade off**

(Source: Pandey I.M. , " Chapter 27 Principles of Working Capital Management" in Financial Management pp 588)

Figure 15.9 illustrates that when the level of current assets increases, cost of liquidity increases while the cost of illiquidity decreases and on the contrary if the level of current assets decreases, cost of illiquidity increases but cost of liquidity decreases.

## 15.10 SUMMARY

This unit has introduced us with the conceptual understanding of the various issues involved in working capital management. We learned that the success or failure of a business largely depends on it. This unit also explained that the gross working capital is the total of all current assets employed in the business whereas net working capital is the difference between current assets and current liabilities. We traced and examined that working capital management involves not only managing different components of current assets but also managing the current liabilities in particular financing aspects of current assets. We also witnessed that the how company start with cash and how it goes through the successive stages of the operating cycle before getting cash along with profits. Further, we saw how working capital requirement of a firm are influenced by several factors like nature of business, size of business, seasonality of operations, production policy and market conditions. An attempt has also been made to highlight the methods of calculating the working capital needs of a firm;

these are mainly ratio of sales method, operating cycle method and percentage of total assets method. We also learned that managing short term assets involved minimizing the two major costs i.e. cost of liquidity and illiquidity and the objective of working capital planning and management is to find the optimal tradeoff between these two costs. In the unit, we also looked that the segregation of working capital into permanent and temporary capital is relevant for working capital policy decisions relating to the financing of working capital requirements. Now, in the next unit you will learn about another important aspect of working capital that is Cash Management.

## 15.11 GLOSSARY

**Gross Working Capital:** It refers to the firm's investment in total assets or circulating assets.

**Net Working Capital:** It may be defined as the excess of current assets over current liabilities.

**Temporary Working Capital:** It is the amount of current assets required over and above the minimum level and this may vary according to the level of activities or operations.

**Permanent Working Capital:** This is the minimum limit in current assets which is required for enduring the business operations without intrusions.

**Operating Cycle:** It is the time period required to convert sales after the conversion of resources into inventories and later in cash.

**Production Cycle:** The cycle commencing from holding of raw material or components and computing with finished goods production is known as 'Production Cycle'.

**Cash:** The term is generally used for both cash, deposits in bank and marketable securities i.e. assets which are near to cash.

**Credit Terms:** It refers to the terms under which a firm sells goods on credit to its customers.

## 15.12ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress –A

5. c 6. c

7. i) fixed assets , current assets

ii) working capital

iii) raw material, work in progress

8) i) True ii) False iii) True

Check Your Progress –B

5, i) d ii) d iii) c

6. a) True

b) True

c) False

d) False

## 15.13 REFERENCES


- Pandey. I.M, (2008), Financial Management, Vikas Publishing House Pvt. Ltd. , Noida*
- Chandra Prasanna, (2010), Financial Management, Tata Mc Graw Hill Education Pvt. ltd, Delhi
- Horne Van, James C. and Wachowicz John M. (2005),'Fundamentals of Financial Management', Pearson Education, Delhi
- Ross Stephen A, Westerfield Randoph W. and Jordan, Bradford D., (2008), Fundamentals of Corporate Finance, Tata Mc Graw Hill Education Pvt. Ltd.
- Rustagi R.P (2009), Financial Management, Galgotia Publishing House, Delhi
- http://mospi.nic.in/mospi_asi.htm
- http://www.itcportal.com/shareholder/annual-reports/itc-annual-report 2016/pdfs/Balance-sheet.pdf

## 15.14 SUGGESTED READINGS


1. Chandra Prasanna, (2011), "Chapter 23 Working Capital Policy, in Financial Management, Tata Mc Graw Hill Education Pvt. ltd, Delhi, pp 563-574
2. Pandey. I.M, (2007), " Chapter 27 Principles of Working Capital Management" in Financial Management, Vikas Publishing House Pvt. Ltd. , Noida, pp 577-597
3. Bhalla, V K.,(2001), Working Capital Management: Text and Cases, Anmol Publications, Delhi
4. Bhalla, V K.,(2014), Chapter 1 Working Capital Management : An overview Working Capital Management: Text and Cases, S Chnad & Company Pvt Ltd. , pp 1-17
5. Periasamy P.,(2007) Working Capital Management, Himalaya Publication House ,Delhi
6. Hampton J J. and C.L. Wagner, Working Capital Management. John Wiley & Sons
7. Bhattacharya Hrishikes,(2009)," Chapter 1 Working capital Working capital: A Techno-Financial Analysis" in Working Capital Management-Strategies and Techniques, PHI Learning Pvt. Ltd., New Delhi, pp 1-29
8. Bodhanwala Ruzbeh J., (2006)," Chapter 11 Basis of Working Capital and Managing Receivables" in Financial Management Using Excel Spread Sheet, Taxmann Allied Services (P.) Ltd., Delhi , pp 273-302
9. Web links

- www.businessdebts.com
- http://www.osi.hu/cpd/policyresources/fmbp/chapter_06_page2_fmbp.html
- http://hsc.csu.edu.au/business_studies/financial_planning/working_capital/Effect_working_capital.html


## 15.15 TERMINAL QUESTIONS

Q1. Explain the concept of working capital. How the working capital requirement can be ascertained?

Q2. Define the term working capital. What factors would you take into consideration, on the formation of a new business, in estimating the amount of working capital requirement?

Q3. Write a brief note on the significance of adequate working capital.

Q4. Distinguish between

a) Operating Cycle and Gross Operating Cycle
b) Operating Cycle and Cash Cycle
c) Gross Working Capital and Net Working Capital

Q5. "Why at all we need working capital can we not do without it." Discuss?

Q6. 'Can risk and return tradeoff be maintained by working capital policy". Comment

Q7. Write short note on 'Inventory Conversion Period'.

Q8.Using imaginary figures how working capital requirements are assessed using operating cycle concept.

Q9. How do you plan for working capital in your organisation?

Q10. What is meant by 'operating cycle concept' in management of working capital?

Q11. What are the various components of working capital?

Q12. How does efficiency of working capital management results to the growth of the firm?

Q13. Working Capital is the lifeblood and the controlling nerve centre of a business. Comment

Q14. 'Liquidity and Profitability are the two faces of a same coin". Comment

Q15. Explain how working capital management policies affect the profitability and liquidity of a company. Highlight the strategies and policies which are successful in a company you are familiar with.

## 15.16 WEB EXERCISES

Go to website of BSE or NSE or SEBI; download the most recent Balance Sheets and Income Statements for any two companies in two different industries of your choice. Also collect information about their financial performance

i) Using the information you gathered, calculate operating cycle for each company. Identify similarities and differences.
ii) Carry out a detailed various working capital ratios for the two companies and identify the area where there is need for improving performance.

# UNIT16 CASH MANAGEMENT



## 16.1 INTRODUCTION

In the previous unit, you learned that Working capital is an integral part of managing a business and therefore its efficient and effective management can ensure incessant earning to the business without hindering its liquidity position. This unit explains that cash is one of the focus areas of the Management and it is absolutely necessary that cash should be sufficient for the survival of the company. Accordingly, cash management strategies are concerned with managing liquidity as well as profitability efficiently so that company can combat the unpredictable changes in cash. The cash management is examined from the four aspects and these are;

a) Managing level of Cash

b) Managing Cash Inflows

c) Managing Cash Outflows and

d) Optimal investment of surplus cash

Now let us learn about these aspects and their method in this unit.

## 16.2 OBJECTIVES

After reading this unit you will be able to:

- Assess the importance of cash management.
- Identify the motives for holding cash.
- Conversant with estimating firm's cash conversion cycle.

## 16.3 ABOUT CASH MANAGEMENT

Cash management is one of the prime concerns of the Finance Managers. It is the most crucial aspect of any business organization. Cash Management means managing cash effectively in the firm so that the firm can achieve appropriate liquidity and maximum profitability. Therefore, it involves devising strategies for optimum utilization of liquid assets so that there are proper raising, disbursement, allocation, and investments of cash and near-cash assets. The optimum cash balance is the position when the company neither has excessive liquid funds nor is facing a cash crunch during its functioning. So managing a business with this optimum level of cash is termed as ideal cash level. Cash management strategies are concerned with managing liquidity as well as profitability so that company may have a win –win situation on these fronts. But balancing these twin objectives is challenging for a company. This happens if a company is holding excessive cash then the company will carry opportunity cost of profits or returns and on the contrary, if a company has a cash shortage due to excessive investments then it will severely impact the manufacturing process. Thus, a finance manager has this responsibility of managing an appropriate cash level in the company as well as balancing liquidity and profitability simultaneously.

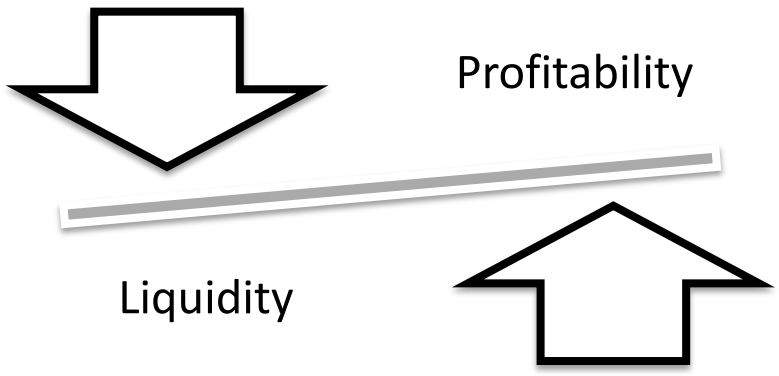



**Fig 16.1 Cash Management Twin Objectives- Balancing Liquidity and Profitability**

"Cash should be held by the company until the time marginal value of the liquidity it gives is equal to the value of the interest lost. (Kishore Ravi). Thus, the basic objective for the Cash

Management is to ensure that cash is sufficient to fulfill current commitments while ensuring that there are no unused funds available in the organization.

Waltson and Head (2007) explained Cash Management as the concept which is concerned with optimizing the amount of cash available, maximizing the interest earned by spare funds not required immediately, and reducing losses caused by delays in the transmission of funds.

According to Zimmerer et al (2008) cash management is the process of forecasting, collecting, disbursing, investing, and planning for cash a company needs to operate smoothly. They further added that cash management is a vital task because it is the most important yet least productive asset that a small business owns. A business must have enough cash to meet its obligations or it will be declared bankrupt. Creditors, employees, and lenders expect to be paid on time and cash is the required medium of exchange

The following are the key functions of Management regarding managing cash;

(i) Regulation of Cash Level in the Company
(ii) Regulation of Cash Inflows in the Company.
(iii) Regulation of Cash Outflows in the Company.
(iv) Optimum Investment or appropriate investment in surplus cash and near-cash assets.

As per ICAI, the following terms are used in Accounting Standard for Local Bodies (ASLB) Financial Reporting under the Cash Basis of Accounting with the meaning specified:

- "Cash comprises cash on hand, demand deposits and cash equivalents.
- Cash basis means a basis of accounting that recognises transactions and other events only when cash is received or paid.
- Cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.
- Cash flows are inflows and outflows of cash.
- Cash payments are cash outflows.
- Cash receipts are cash inflows.
- Control of cash arises when the entity can use or otherwise benefit from the cash in pursuit of its objectives and can exclude or regulate the access of others to that benefit."

Since there is a lack of synchronization between cash outflows and cash inflows, therefore, it is pertinent to identify the timings and amount of future cash flows. Seasonal industries generally follow a conservative approach in holding cash as they witness asymmetry in cash receipts and cash payments.

Effective Cash management involves the management of cash inflows and outflows which involves (Kishore Ravi);

a) Appropriate estimation of cash flows

b) The symmetry between cash inflows and outflows

c) Using Floats

d) Increasing Collections

d) Availability of funds whenever needed

e) Controlling disbursements

Therefore, the main objective of cash management is short term forecasting of cash and near-cash assets position in an enterprise and taking steps for financing cash deficit during a given point of time and investing cash surplus if any at a given point of time.

## 16.3.1CASH MANAGEMENT CYCLE

The main objective of working capital management is to reduce the cash conversion cycle to manageable limits. The company can achieve this by reducing the raw material work in progress and receivables conversion periods and by increasing the Average Payable Period.

Raw material Conversion Period+ Work in Progress Conversion Period+ Finished Goods Conversion Period+ Receivables Conversion Period- Average Payable Period =Cash Conversion Cycle

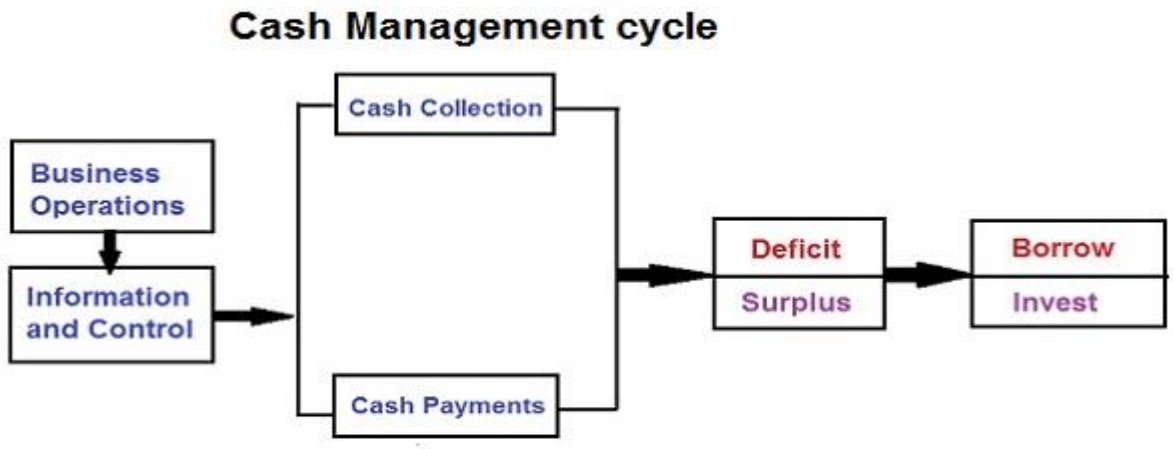



**Fig 16.2 Cash Management Cycle (Source Pandey I.M, Chapter 30 Cash Management, page No. 640)**

Hence, the main aspect of cash management is managing cash collections, cash payments, and cash surplus held. From cash management cycle it can be inferred that from where cash results and where it is disbursed for the payments. Further, if there is surplus cash then it has to be invested for earning returns and on the contrary, if there is deficit then funds is borrowed to meet the remaining payments. The ideal cash management accomplishes the above with the minimum cost. However, this ideal cash management depends upon organization structure, market position, industry's norms, economic position, sales level, competition, etc. Accordingly, a company needs to hold cash balances to have sufficient

liquidity. Therefore, there are certain motives due to which a company holds cash balances. Let us study this in the next section;

## 16.4 MOTIVES OF HOLDING CASH

The firm needs to keep an optimum level of cash in an organisation because of the following three motives;

**Transaction Motive** – Cash is required for meeting day to day obligation of the business, Firm requires cash for the payments of raw material, purchases, wages and salaries, operating expenses, dividends, interests, installation charges, etc. Since there is a time lag between receipts and payments of cash therefore the company needs to keep sufficient amount of cash for the routine expenses. For meeting these routine expenses, the working cash inflows should be in surplus than the working capital outflows. The company may also invest funds in marketable securities for meeting out funds required for transactions, as marketable securities are also considered as near cash assets. Generally, companies invest cash in securities whose maturity matches the payments required for dividends, interest charges, etc. Cash is kept for the transactionary motive to meet payments whose timing is not perfectly matched with cash inflows. However, online banking, e-payments apps, online transfers have changed the scenario of keeping an additional buffer for transaction purposes.

**Precautionary motive-** Companies hold cash to meet uncertainties, contingencies, unforeseen circumstances, and fluctuations in the market. Accordingly, cash is retained by the companies to have smooth business operations to face such uncertainties. Keeping funds in liquid form or in bank account as a safeguard against unforeseen events is also important for the management.

**Speculative Motive-** Another motive of holding cash is for speculation purposes. For taking advantage of speculative investment opportunities cash may be kept by the companies. Sometimes a company may find unexpected opportunities during normal business routine such a sudden decrease in prices of raw material which is not expected to exist for long or company is interested to invest into some securities due to sudden decline in prices. These transactions are purely speculative in nature and hence companies or firms keep cash to explore possibilities that are out of the usual course of business.

**Compensation Motive-** Companies or Business Organisations also keeps some minimum balance in their current account as per the policies of the banks. This minimum balance is not allowed for transaction purposes; therefore it is also a type of investment of liquid funds by the company in the Bank Accounts.

The cash management deals with the following facets these are;

A) Cash Planning

B) Managing Cash Flows

C) Determining Optimum Cash Level

D) Investing Surplus Funds

These are taken one by one in this unit, let us discuss very first aspect that is cash planning.

# 16.5 CASH PLANNING

The management needs to plan and use cash appropriately. It will help in estimating cash inflows and cash outflows for a given point of time. This will help in ensuring that the company has sufficient funds to meet expenditures effectively over the year and cash surplus or deficit so found are adequately met. This planning can be prepared for weekly, monthly, quarterly, or yearly basis depending upon the nature and scale of operations. Cash budget is one of the important devices for planning cash inflows and outflows of a firm at a given point of time. It helps in better monitoring and control.

## 16.5.1 CASH BUDGET

Cash Budget depicts the amount of cash receipts and cash payments or you can say it represents cash inflows and outflows over a given period of time. It helps in estimating the future cash requirements of the company and planning for financing these requirements, exercising control over the cash inflows and outflows and maintaining liquidity of the firm. Such cash inflows and outflows include income received, expenses charged, and receipts and payments for loans. In other words, cash budgeting is a projected future financial situation forecast of the business.

Now take a look of few definitions of cash budget;

"This budget represents the amount of cash receipts and payments, and a balance during budgeted period, it is prepared after all the functional budget are prepared by the chief accountant either monthly or weekly giving the following hints;

a) It ensures sufficient cash for business requirements.

b) It proposes arrangements to be made overdraft to meet any shortage of cash.

c) It reveals the surplus amount and the effect of the seasonal fluctuations on cash position." (Pillai and Bhagavathi)

"A cash budget is a summary statement of the firms expected cash flows and outflows over a projected time period. It gives information on the timing and magnitude of expected cash flows and cash balances over the projected period" (Pandey I.M)

A cash budget is a summary of movement of cash during a particular period."(Rustagi)

Hence, cash budget helps in effective cash management as it can identify cash deficit as well as cash surplus. Further, it will help a company in recording sources of receipts and payments to know how much cash to be held, to what extent funds from the bank can be raised and to

what extent surplus funds can be invested in marketable securities. Cash flow statement is different from the cash budget as in cash flow statement the cash generated and used during a given point of time is reported under the three heads that are operating, financial and investing activities. The cash flow statement is prepared from the past figures whereas cash budget is forecasting regarding cash inflows and outflows for the future.

Cash budget is prepared as per the following Methods;

a) Receipts and payments Method

b) Adjusted Net Income Method

c) The Balance Sheet Method

1) Receipts and Payment Methods-In this method, cash receipts from various sources and cash payments to various agencies and individuals are estimated. Cash receipts are added to the opening balance of cash and from the total, the total of estimated cash payments is deducted to determine the closing a balance.

| Particulars | Amount |
|---|---|
| **Opening cash balance** | |
| **Add Receipts** | |
| Cash Sales | |
| Collection from Debtors | |
| Advance Received | |
| Dividend Received/Interest Receive | |
| Sale of Investments | |
| Raising of funds | |
| Tax Refund | |
| Revenue receipts | |
| **Less payments** | |
| Creditors | |
| Wages& Salaries | |
| Overheads | |
| Purchase of fixed assets | |
| Purchase of securities | |
| Payment of loans | |
| Surplus/Shoratge | |
| **Closing Cash Balance** | |

2) Adjusted Profit and Loss Method

In this method cash budget is prepared on the basis of opening cash and bank balances, projected profit and loss account and balances of the assets and liabilities.

| **Particulars** | **Amount** |
|---|---|
| Opening Balance | |
| **Add** Net Profit | |
| Depreciation | |
| Decrease in B/R | |
| Issue of Securities | |
| Increase in B/P | |
| Decrease in Stock | |
| Depreciation, Goodwill written off | |
| Transfer to General Reserves | |
| **Less** Purchase of Machinery | |
| Purchase of Furniture | |
| Increase in Debtors | |
| Decrease of Creditors | |
| Decrease in other current liabilities. | |
| Dividend | |
| **Closing Balance** | |

3) The Balance Sheet Method

In this method at the end, budgeted balances for cash and bank or forecasted balance sheet is prepared in which assets and liabilities are presented and the balancing figures are computed that represents overdraft or cash balance. When assets are less than liabilities then the difference will be Cash Balance. On the other hand when assets are more than liabilities the difference will be Bank Overdraft.

Let us now consider preparation of cash budget from the illustration given below;

From the information provided by XYZ Ltd. regarding income and expenditure for three months October, November and December, let us compute cash budget. The bank balance on 1st October, 2020 was Rs 15,00,000

| Month | Sales | Purchases | Wages | Factory Expenses | Administration and Selling Expenses |
|---|---|---|---|---|---|
| July | 20,00,000 | 12,00,000 | 1,00,000 | 2,00,000 | 1,00,000 |
| August | 18,00,000 | 8,00,000 | 90,000 | 2,00,000 | 1,20,000 |
| September | 21,00,000 | 11,00,000 | 1,10,000 | 1,80,000 | 1,30,000 |
| October | 17,00,000 | 8,00,000 | 1,20,000 | 1,90,000 | 1,10,000 |
| November | 18,00,000 | 10,00,000 | 1,00,000 | 1,85,000 | 1,10,000 |
| December | 20,00,000 | 10,00,000 | 1,50,000 | 2,30,000 | 1,30,000 |

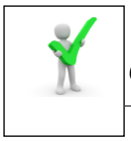
| Particulars | |
|---|---|
| Sales Commission due two month after sales is payable in addition to selling expenses | 5 percent on sales |
| Purchase of Plant in the month of December | 1,00,000 |
| Dividend payable in November | 1,00,000 |
| Two months credit allowed to customer and three months credit is offered from the suppliers | |
| Wages, Factory Expenses and Administrative expenses are paid in the next month | |

**Cash Budget for three months**

**October to December, 2020**

| | October | November | December |
|---|---|---|---|
| **Receipts** | | | |
| Opening Balance | 1500000 | 1590000 | 2265000 |
| Sundry Debtors | 1800000 | 2100000 | 1700000 |
| | 3300000 | 3690000 | 3965000 |
| | | | |
| **Payments** | | | |
| Sundry Creditors | 1200000 | 800000 | 1100000 |
| Wages | 110000 | 120000 | 100000 |
| Factory Expenses | 180000 | 190000 | 185000 |
| Administration and Selling Expenses | 130000 | 110000 | 110000 |
| Dividend payment | | 100000 | |
| Sales Commission | 90000 | 105000 | 85000 |
| Purchase of Plant | | | 100000 |
| | 1710000 | 1425000 | 1680000 |
| **Closing Balance** | **1590000** | **2265000** | **2285000** |

Cash Reports are also prepared by finance mangers to know the actual cash position on a more frequent basis i.e. on a daily or a weekly basis. Cash reports are generally prepared when cash inflows and outflows can be forecasted with accuracy. Cash reports help in keeping a check on actual data and budgeted data and making changes accordingly in financing patterns and controlling cash or marketable securities.



***Check Your Progress-A***

**Q1. What do you mean by Cash Management?**

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**Q2. What are the motives of holding cash in a company?**

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**Q3. What is Cash budget?**

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**Q4. Draw Cash Management Cycle.**

# 16.6 MANAGEMENT OF FLOAT AND CASH FLOWS

## 16.6.1 MANAGEMENT OF FLOAT

A Company should control cash outflows effectively. This means that cash disbursements can help in retaining cash with the company. Therefore, trade credit is also termed as spontaneous finance. The company should make the best possible use of credit terms and by maximizing delay in payment (but without affecting goodwill) results in maximum availability of funds. Now, how this time lag or float can be used as cash management strategies is discussed as under;

Float means the amount of money that is tied up between the time a payment is initiated and actual funds become available in the company's bank account. When a firm collects or accepts payments in cheque and the same is processed at a later date this difference between when the cheque was received and actual payment was received is termed as a float. Float refers to the "amount of money tied up between the time a payment is initiated and cleared funds become available in the company's bank account. The efficiency of firm's cash management can be enhanced by having knowledge and use of various proceeds aiming at accelerating cash inflows and controlling cash outflows." (Kishore Ravi) Therefore, this float should be managed strategically and efficiently to reduce the breadth and depth of the cash management cycle. The various sources of float which company face;

**Billing Float-** When the goods are dispatched to the customer an invoice is prepared for the goods consigned. The time lag between the sale of goods and mailing of invoice or bill is termed as billing float.

**Mailing Float**- The Time lag between cheque sent by the customer through mail and cheque received at the seller's office is termed as Mail Float.

**Processing Float-** The Time gap between the receipt of cheque and deposit of cheque into the bank account is termed as Processing Float.

**Cheque Clearing Float-** When there is a gap between the time of depositing a cheque and the period when the funds are available for spending is termed as Cheque Clearing Float.

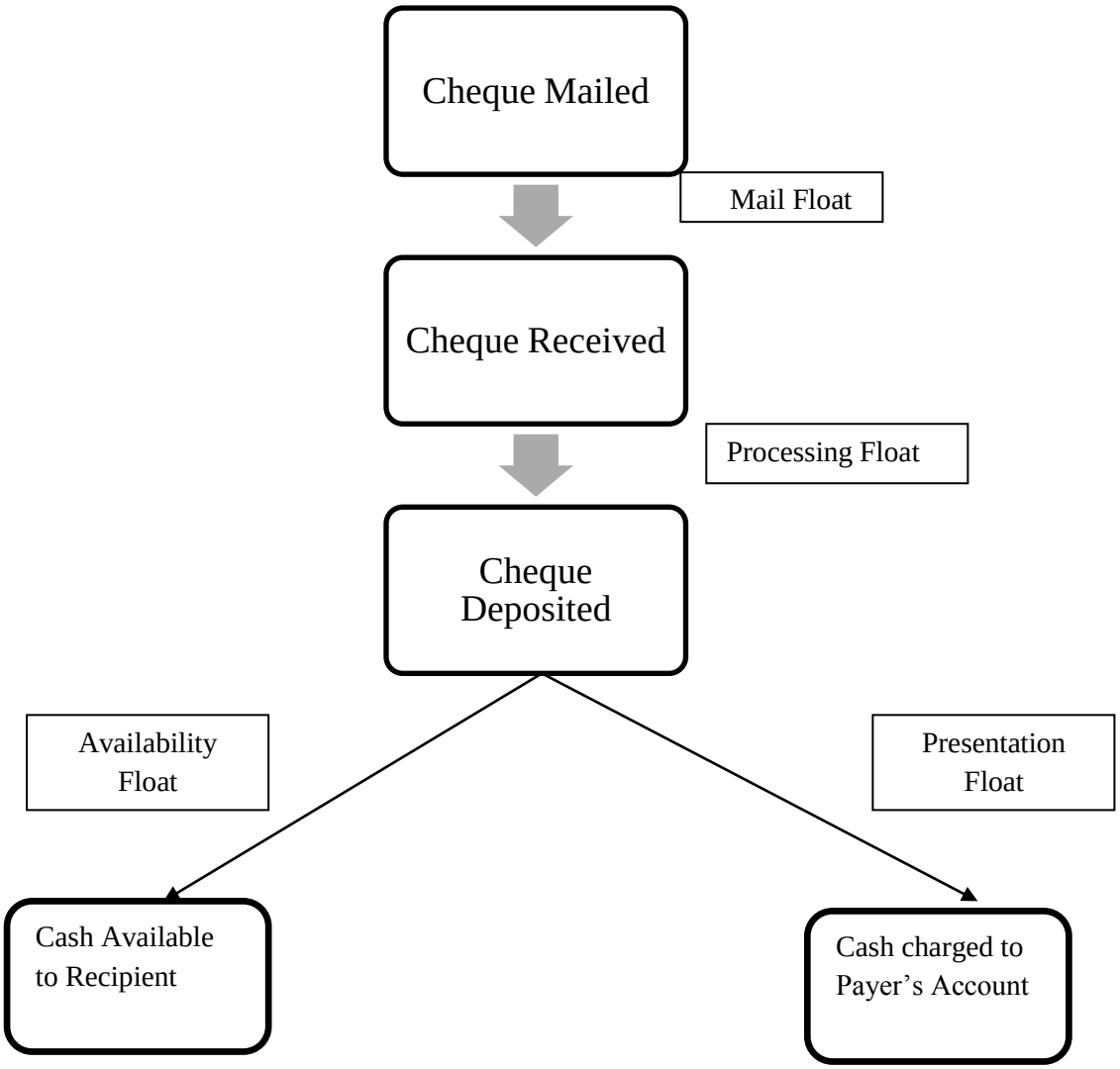



**Fig 16.3 Types of Floats (Source: Bodhanwala in Chapter 13 Cash Management, pp 329)**

Types of Float are ;

a) Collection Float

b) Payment Float

C) Net Float

Collection Float is the time lag between the payments made by the customers or the debtors and the time funds are actually available for usage. It is the time lag when the amount is deposited according to record of the company and the amount of cash reflected as per the record of the bank.

Cheques issued by the bank but not paid at any given time are called 'payment float'. The interval between the day a cheque is deposited and the day that the sum is finally withdrawn from the bank balance of the firm is termed as payment float. This float can be used at the time of adverse time when a company faces a shortage of cash as it helps to extend money in times of need.

The difference between the payment float and the receipt float is termed as a net float. The net float is the total difference between the bank balance available to the business and the balance reported by the company's ledger. If the net float is positive, i.e. payment float is more than receipt float, and then the bank balance available exceeds that of the book. A business with a positive net float will take advantage of it and retain a lower cash balance.

Therefore, effective cash management focuses on accelerated cash collections and decelerates cash disbursements to the extent it can easily and optimally manage. Therefore, a company has to 'play with float' to maximize the availability of the funds with the company. If a finance manager can accurately determine to predict receipt of cheques and cash and similarly payment of cash and cheques accurately then the manager can play with this float for earning returns.

## 16.6.2 MANAGING CASH FLOWS

Cash flows should be adequately controlled by the finance manager. This requires reviewing and controlling on a regular basis. A company needs to formulate a method whereby each functional unit maintains sufficient cash to fulfill its regular requirements without keeping in hand surplus balances. Thus management should focus on accelerated collection using a decentralized collection process as this will help in speedy recovery from the debtors. The Concentration banking and lockbox system also serves in speedy collections from debtors.

**Concentration Banking-** In concentration banking, a company establishes various collection centres in different regions near debtors. The firm collects payments at the regional collection centre instead of a single collection center at the head office. The payment so collected at the local banks is transferred to the head office's bank account. Accordingly, this system will reduce the collection time from the debtors and hence will help in effective cash management. "The movement of cash from lockbox or field banks into the firm's central cash pool residing in a concentration bank is termed as cash concentration." (Van Horne) This cash concentration process contributes in improving control over cash flows, keeping minimum compensating balances, and accordingly reducing the size of the float.

**Lockbox System-** Under the Lockbox System, the customers send their payments to the nearest post office box also called 'lockboxes'. The companies through the local banks collect the amount from the post office boxes and these banks later credit the amount to the company's account after deducting their cost. These banks collect amount or cheques from the post office several times a day. This system can streamline collections for the company

where high denominations cheques or large amount of payments need to be collected. In India, this system is not so popular because sometimes this system is highly costly and it is also not profitable for the firms whose receivables are few in number. Using advanced lockbox technology, banks have built several contact channels for companies to use for payment and deposit receipts.

**Online Transfers-**In the recent past years, online transfer of funds provided has drastically changed the cash management strategies of the firm. In today's world information and funds are transferred from one account to another with great speed and reliability. This has lead in forecasting patterns and management of cash and near-cash assets. In general, the speed of electronic fund transfer has to an extent eliminated float. Electronic Fund Transfer has magnified reliability by rendering accurate information tracked from using debit and credit cards. This has not only helped in saving money but also helped in reducing hard cash. This means that with electronic fund transfers, one can easily transfer money from one bank account to another without the exchange of physical cash. The system does not only reduce hard cash but also abolish paper money and eliminate most crimes (Bitwababo, 2011). Online transfer of funds system is gradually replacing manual processes with electronic data processing and this system has scaled up the flow of funds by transmitting data at high speed. These methods are simple, effective, customer-friendly, and are easy to handle; with which money can be sent or received across the globe without any problems or hassles.

Therefore, the above systems are sustainable if expenses are less than profits or returns, and the same is not capable of adoption if company is spending more than the returns generated from the above system.

The next important decision in cash management is determining the optimum level of cash balance from the following models that have been developed for estimating optimum level. Many types of mathematical models have been built by finance wizards that will help companies in deciding the optimal cash balance.

# 16.7 CASH MANAGEMENT MODELS

## 16.7.1 BAUMOL'S MODEL

This model has been propounded by Willam Baumol as published in the "Transactions Demand for Cash: An Inventory Theoretic Approach" published in The Quarterly Journal of Economics in Year 1952. In this, he suggested that cash should be managed in the same way as inventory is managed based on the optimum cash balance.

This model states that the level at which the carrying cost and transaction costs are the minimum is basically an optimum cash level. The carrying cost or holding cost refers to the

cost of holding cash that is interest forgone on marketable securities or you can say it is an opportunity cost in terms of interest forgone on investment of this cash. Transaction cost is the cost incurred due to the conversion of cash into marketable securities and *vice versa;* that cost incurred in the form of brokerage, commission, etc. The optimum level of cash is determined using the following formula;

Optimum level of Cash balance= $\sqrt{\frac{2AT}{I}}$

Where

A =Annual Cash Payments

T =Cost per transaction of purchase or sale of marketable securities

I =Interest on marketable securities (carrying cost per rupee of cash)

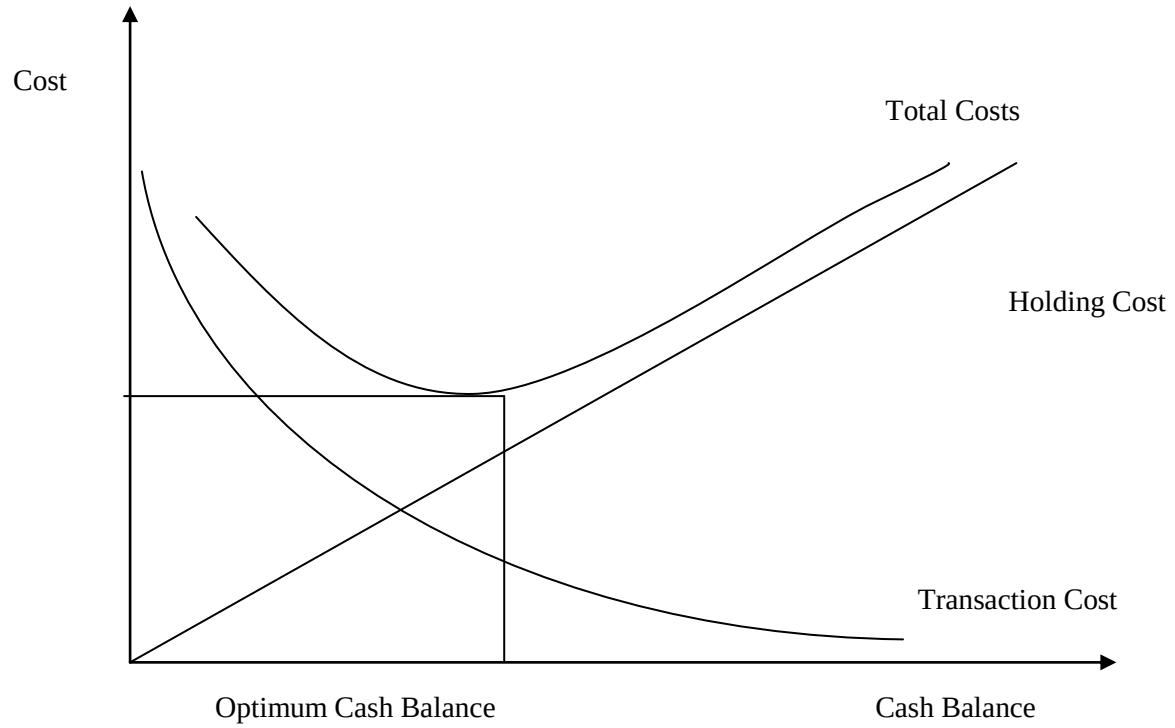
The model has the following assumptions;

a) The company can predict its requirements of cash with certainty.

b) The opportunity cost of holding cost is known and is constant.

c) A company can easily access transaction cost and this also remain constant.

d) Cash usage of the company can be assessed with certainty and it is also uniform over a period of time.



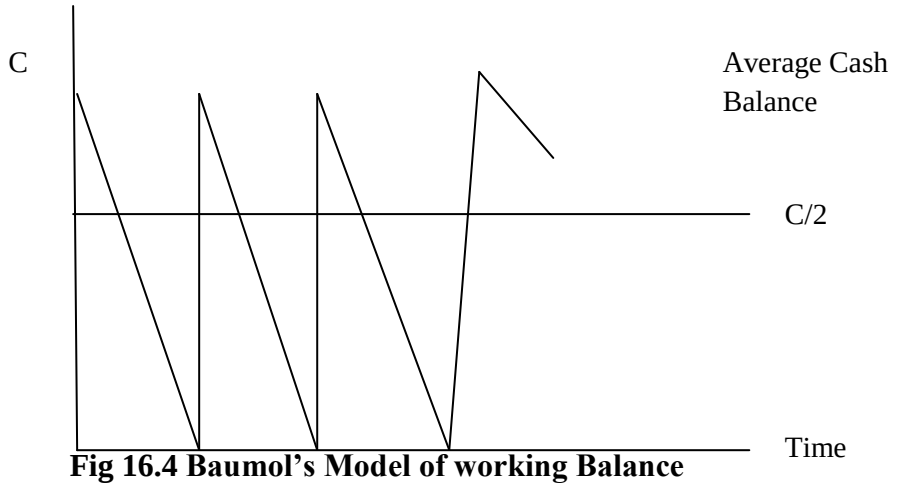



**Fig 16.4 Baumol's Model of working Balance**

Let us try to calculate optimum level of cash using Baumol's Model on the basis of the following information;

Total Cash need of the ABC Limited is Rs 4,00,000 per annum. Annual returns from the marketable securities are 16% per annum. The cost of converting money into securities is Rs 40 per transaction. Securities can be bought and sold in fractions. You are required to calculate optimum level of cash using Baumol's Model.

Optimum level of cash= $\sqrt{\frac{2AT}{I}}$

$= \sqrt{\frac{2*4,00,000*40}{.16}}$

=14142.1356

## 16.7.2 MILLER-ORR MODEL

This model assumes that cash flows pattern is stochastic in nature. This means that net cash flows are normally distributed with a zero value of mean and a standard deviation. This model argues that changes in cash balance for a given time period are random in nature as well as in size. The Miller-Orr cash management model is developed for the companies that witness unpredictable cash inflows and outflows. This model specifies for setting two control limits for setting lower and upper cash equilibrium limits and assessing the return point (target cash balance). This is different from the Baumol Model which is based on the premise that cash flows are constant in nature. Company also needs to determine the return point or the target cash balance. If the company's cash flows fluctuate unexpectedly and reach the upper limit, the company buys enough marketable securities to return to come back to the

regular cash balance level or you can say to the return point. However, if the firm's cash flows fluctuate and hit the lower limit then it sells sufficient marketable securities to restore the cash balance to the normal level or the return point .The difference between upper control limit and lower control limit is determined on the basis of the following three factors;

a) Transaction cost(tc)

b) Standard deviation($\sigma$)

c) Interest Rate(i)

The formula for determining the distance between upper and lower limit that is termed as z or spread is depicted as under;

(Upper limit-Lower limit) = $\sqrt[3]{\frac{\frac{3}{4}\times tc\times\sigma^2}{i}}$

Or could be written as

(Upper limit-Lower limit)= $(3/4 \times Transaction\ Cost \times Cash\ Flow\ Variance/ Interest\ perday)\ 1/3$

Upper Limit= Lower limit+3z

Return Point = Lower limit+z

Average Cash balance== Lower limit+0.75z

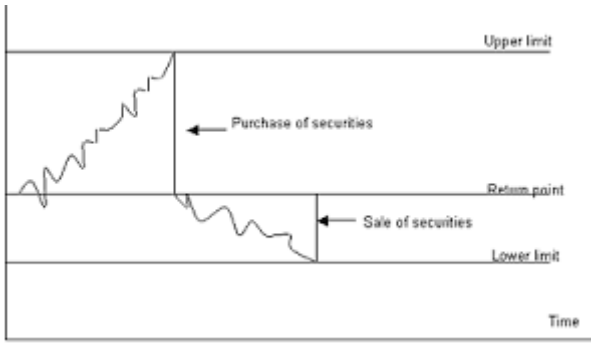



**Fig 16.5 Miller-Orr Model**

This is different from the Baumol's model, as it is based on the following assumptions;

a) Cash flows pattern is stochastic in nature and there is no underlining trend in the cash balance.

b) The cash spending rate is constant.

c) A company can have different cash payments per day, as well as different cash receipts.

d) There is a possibility of investing surplus cash in marketable securities.

ABC Ltd. has a policy of maintaining Rs 1, 00,000 as cash level. The following information is provided by ABC Ltd to you for determining Lower Limit and Return point under Miller-Orr Model;

Standard deviation of the company cash flow=10,000

Annual interest rate 10%

Transaction cast Rs 50

$$Z= \sqrt[3]{\frac{\frac{3}{4}\times tc\times \sigma^2}{i}}$$

$$= \sqrt[3]{\frac{\frac{3}{4}\times 50\times 10000^2}{.10/360}}$$

Upper Limit= Lower limit+3z

= 200000+3( 23811.0158)

=271433.0474

Return Point= Lower limit + z

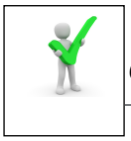
= 200000+23811.0158

=223811.0158

## 16.7.3 STONE'S UNCERTAINTY MODEL

This model was explained by BK Stone in " The Use of Forecasts and Smoothing in Control Limit Models for Cash Management". This model also has the same foundations as of Miller-orr Model as far as control-limits are concerned. His model is a little extension to Miller orr Model in the sense that when approaching an upper or lower limit it is very much likely that the cash surplus or deficit may naturally correct itself. This means he identifies two sets of limits that are outer and inner limit. If the outer limits are crossed in this model then the finance manager will not do a transaction but will initiate to do analysis to determine the predicted pattern of cash flows in coming days. If the cash balance is expected to return

within the internal limits in the coming days, then he will not initiate any transaction. However, if there is deviation then he will find the target balance and the closing balance, then the buying and selling of securities may take place so that the closing balance at the given point of time is equal to the target balance. Hence, the Stone Model takes cash flow forecast into consideration.



***Check Your Progress-B***

**Q1. What do you mean by Concentration Banking?**

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**Q2. What is Baumol Model of determining optimum cash level for a firm?**

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**Q3. What are the basic assumptions of Miller-Orr Model?**

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# 16.8 TREASURY MANAGEMENT

Treasury Management involves planning, raising, organizing, directing, and controlling funds and working capital of the enterprise so that optimum use of funds can be possible while maintaining liquidity, profitability and reducing the overall cost of funds together with mitigating operational and financial risk. Treasury management is defined as 'the corporate handling of all financial matters, the generation of external, and internal funds for business,

the management of currencies and cash flows and the complex strategies, policies and procedures of corporate finance. (Kishore Ravi) Treasurers are usually responsible for liquidity risk management, market risk management, credit risk management, and organizational risk management.

The following are the key aspects of Treasury Management;

i. It helps in managing cash and near-cash assets.
ii. It helps in reconciling bank statement.
iii. It helps in formulating the capital structure of an organization depending upon the goals and objectives of the company.
iv. It helps in the credit management of the company.
v. It helps in establishing credit policy regarding decisions about trade discount, credit terms and receivables aging schedules.
vi. It focuses on maintaining liquidity, or solvency of the company.
vii. It helps in establishing liaison with bankers, financial institutions and investors.
viii. It helps in managing currency, transaction, and translation exposure during international business operations.
ix. It helps in tax management, insurance, and investment management.
x. It helps in regulating the transmission of funds from various divisions and units to the headquarters and *vice versa.*
xi. It helps in investing surplus funds in marketable securities for the short term.
xii. It helps in determining various types of floats and making them useful for the fund management.

In nutshell, the following are the functions of a Treasurer;

a) Cash forecasting, budgeting and planning
b) Working Capital Monitoring
c) Currency Management
d) Fund Planning and Management
e) Financial Planning and Budgeting
f) Financial reporting, bookkeeping and record-keeping
g) Capital assets and stock monitoring
h) Risk Management
i) Credit rating agency relations
j) Liquidity Management
k) Trading and Arbitrage

Cash Management is closely associated with treasury management. It helps in fulfilling short term needs regarding the availability of cash at a given point of time so as to find the deficit and surplus in the cash position.

Further, the controller of a company has to record the transactions of these cash and near-cash assets. Treasurer, as well as Controller, should work synchronously to establish an effective control system. The Internal Control System should be established in such a way that it reduces errors, discrepancies, and financial misconducts and wrongdoing. Such system should act as a whistle blower so that it can find as well as prevent it. If a proper monitoring system is introduced, it immediately shows the weakness of the cash management strategies, receivables, discounts, expenditure, etc.

## 16.9 MARKETABLE SECURITIES

Marketable Securities is an important aspect in cash management as they provide avenues of investment for the short term period and can promptly be converted into cash as per the requirement. Hence, these securities serve liquidity as well as profitability to an organization. These are short term money market instruments that can be converted into cash as and when needed. These marketable securities typically have maturities of less than a year. Since they have high liquidity, these investments are perfect for working where working capital needs are fluctuating. Since, we discussed in the previous sections that idle cash provides no explicit returns therefore surplus cash balance should be invested in the marketable securities. A firm should hold as much cash balance that is required for the normal functioning of the business. Further, some reserve should be kept for the precautionary purpose and the remaining surplus amount should be invested in short-term liquid securities to earn interest. While investing in marketable securities the following factors should be considered by the company;

1) Safety-The basic factor while investing marketable securities is selecting securities that have no risk of default in interest or principal repayment. In the case of short term investment finance manager can forgo higher returns for the safety of principal and interest.

2) Maturity- The length of time for which surplus cash is expected for availability should be matched with the maturity of marketable securities. For removing financial distress, a company should invest in the marketable security for the shorter duration then the expected availability period.

3) Marketability-Marketability means convenience and accessibility of converting securities into cash. Hence, companies should invest in securities which can be sold quickly without loss.

4) Liquidity- Liquidity means the ability of conversion of an asset into cash. Therefore, a company should ensure that the selected investment vehicle should be easily, speedily, and conveniently be converted into cash.

5) Taxability- Securities exempted from tax are offered on the market at a lower yield than other securities with the same maturity. Therefore, the tax aspect should be considered when choosing marketable securities for investment.

Types of Marketable securities are;

Bank deposits- Investing surplus funds in short term deposit schemes in the banks.

Intercorporate deposits are investing excess cash in other firms as deposits however for the short term. Generally, these are from three months to one year.

Bill discounting- Company with surplus funds can also discount the bills of other firms or companies in similar patterns as it is done by commercial banks.

Treasury bills- These are one of the most preferred investments for surplus funds for the short term. These are issued by RBI for different maturity periods. These are considered as highly safe and easily marketable investments.

Commercial papers are short term unsecured securities issued by highly creditworthy companies.

Money market fund is a type of mutual fund that invests only in highly liquid and short-term and high credit rating securities.

## 16.10 SUMMARY

In this unit we discussed about cash management that is efficient cash collection and cash disbursement. Cash Management involves temporarily investment of idle cash with the company. Cash management strategies are concerned with managing liquidity as well as profitability so that company may have win –win situation on these fronts. But balancing these twin objectives is really challenging for a company. This happens if a company is holding excessive cash then the company will carry opportunity cost of profits or returns and on the contrary, if a company has a cash shortage due to excessive investments then it will severely impact the manufacturing process. Since, there is a lack in synchronization between cash outflows and cash inflows, therefore it is pertinent to identify the timings and amount of future cash flows. Cash Budget depicts the amount of cash receipts and cash payments or you can say it represents cash inflows and outflows over a given period of time. In this unit you also learned various models for determining optimum cash level in the company. In the next unit, you will be apprised with another aspect of working capital that is inventory management.

## 16.11 GLOSSARY

**Cash:** The term is generally used for both cash, deposits in bank and marketable securities i.e. assets which are near to cash.

**Operating Cycle:** It is the time period required to convert sales after the conversion of resources into inventories and later in cash.

**Production Cycle:** The cycle commencing from holding of raw material or components and computing with finished goods production is known as 'Production Cycle'.

**Treasury Management:** It involves planning, raising, organizing, directing and controlling funds and working capital of the enterprise so that optimum use of funds can be possible while maintaining liquidity, profitability and by reducing overall cost of funds together with mitigating operational and financial risk.

## 16.12 REFERENCES


- Kishore Ravi M.(2009), "Chapter17 Management of Cash and Marketable Securities" in Financial Management, Seventh Edition, Taxmann Publication (p) Ltd., pp 545-57
- Khan, M.Y. and Jain, P.K.,(2006), Chapter 29 Management of Cash and Marketable Securities" in Financial Management Text and Problems., Second Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, pp 29.1-29.42
- Sristava Rajiv and Mishra Anil (2016), "Chapter 24 Cash Management" in Financial Management, Oxford University Press, New Delhi, pp 611-629
- Pandey, I.M. (2010), "Chapter 30 Cash Management" in Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi, pp 640-656
- Rustagi R.P. (2011), "Chapter19 Management of Cash and Marketable Securities" Financial Management- Theory, Concepts and Problems, Fifth Revised Edition, Taxmann Publications (P) Ltd. pp 534-564
- Van Horne, James C. and Wachowicz, John M. Jr (2009), "Chapter 9 Cash and Marketable Securities Management" in Fundamentals of Financial Management, 13th edition, Pearson Education Limited, pp 221-248
- Rubeh J. Bohanwala(2006), "Chapter 13 Cash Management", in Financial Management, Second Edition, Taxmann Allied Services (P) Ltd. , pp 319-335

- Kuchhal S.C. (1980), "Chapter 9 Managing Cash Poistion"in Financial management: An Analytical and Conceptual Approach, Seventh Edition, pp 419-444
- Bhattacharya Hrishikes (2009), Chapter 5 Liquidity and Cash Management" in Working Capital Management, PHI Learning Pvt Ltd., pp 272-374
- Dr. Wanjare Joshua(2014), Computerized Funds Transfer System and Cash Management at Kisumu East District Treasury, Retrieved from https://pdfs.semanticscholar.org/7f63/88fcf5ddf9be75b1b65e596d62d8e1922821.pdf, last accessed 27/4/2020


## 16.13 SUGGESTED READINGS


**1.** Chandra Prasanna, (2010), Financial Management, Tata Mc Graw Hill Education Pvt. ltd, Delhi

**2.** Pandey. I.M, (2008), Financial Management, Vikas Publishing House Pvt. Ltd. , Noida

**3.** Bhalla, V K.,(2001), Working Capital Management: Text and Cases, Anmol Publications, Delhi

**4.** Periasamy P.,(2007) Working Capital Management, Himalaya Publication House ,Delhi

**5.** Hampton J J. and C.L. Wagner Working Capital Management. John Wiley & Sons

**6.** Bhattacharya Hrishikes,(2009),Working Capital Management-Strategies and Techniques, PHI Learning Pvt. Ltd., New Delhi

**7.** Bodhanwala Ruzbeh J., (2006), Financial Management Using Excel Spread Sheet, Taxmann Allied Services (P.) Ltd., Delhi

Web links

**8**. Essays, UK. (November 2018). Literature Review of Cash and Cash Management. Retrieved from https://ukdiss.com/litreview/literature-review-about-cash-and-cash-management.php?vref=1, last accessed 29/4/2020

**9.** Akenne edith claire, The impact of cash management on profitability of small retail businesseshttps://www.academia.edu/24217964/the_impact_of_cash_management_on_profitability_of_small_retail_businesses, last accessed 29/4/2020

**10.** www.businessdebts.com

**11.** http://www.osi.hu/cpd/policyresources/fmbp/chapter_06_page2_fmbp.html

**12.**http://hsc.csu.edu.au/business_studies/financial_planning/working_capital/Effect_working_capital.html

**13.** https://cpfga.icai.org/wp-content/uploads/2019/06/Cash-basis-ASLB.pdf

## 16.14 TERMINAL QUESTIONS

Q1. Discuss Baumol's Model of Cash Management.

Q2. What are the main motives for holding cash and near cash assets?

Q3. Discuss the importance of cash budgeting.

Q4. Discuss some of the strategies of cash management. Using hypothetical example show the cash management cycle.

Q5. What is the importance of speedy receivables collection? Also explain concentration banking and lockbox system.

Q6. What is lock box system and how it is used to reduce cash balances.

Q7. Explain the procedure of preparing cash budget.

# UNIT 17 INVENTORY MANAGEMENT



## 17.1 INTRODUCTION

Inventory constitutes a significant part of current asset of manufacturing companies. Inventory can be defined as the stock of goods, the companies' holds with them. All firms invest in inventories- raw material, work-in progress and finished goods. Because inventory is a significant part of current assets, it requires a considerable amount tied with them. Given the size of the fund invested in holding inventory, it is, therefore, imperative to manage it efficiently and effectively.

## 17.2 OBJECTIVES

After going through this unit, the reader should be able to

- Understand the meaning of inventory
- Understand the motive behind holding inventory
- Discuss various types of inventory

- Analyze various cost associated with inventory
- Understand how to determine optimal level inventory usage
- Economic Order Quantity (EOQ) Model
- Understand the concept and determination of re-order point and safety stock
- Understand and analyze inventory management techniques

## 17.3 ABOUT INVENTORY

L.R observed that- "The proper management and control of inventory not only solves the acute problem of liquidity but also increases annuals profits and causes substantial reduction in the working capital of the firm". Presently business action has expanded and the issue of inventory has also become more complex. The business-man needs more money to lead his everyday business exercises. Therefore, the higher the degree of inventory, lower the degree of money. So, the requirement for inventory must be adjusted against the preference for liquidity. If the inventory in more in stock then it will save the cost of idle time of machinery and the cost of idle time of men.

## 17.4 TYPES OF INVENTORY

Broadly, based on the manufacturing firms, inventory is categorized into raw material; semi finished goods and finished products.

**17.4.1 RAW MATERIAL:** Raw material is basic material input of the production process. For example, a construction business, cement, bricks, iron rods etc are raw material. For a food processing unit, grain, oil, salt, seasoning etc are the raw material. All firms maintain a stock of raw material with them. Normally, a large amount is invested in maintaining the stock of raw material. It is done because of the following reasons-

a) To decouple the production function from purchasing function: The firm want to make these two functions independent from each other, they want a smooth flow of raw material ready for their production process. They do not want to interrupt the production because of delay or non-availability of raw material.

b) Secondly, firms find it economical to purchase the raw material in bulk/ large quantity. Also, firms want to maintain a large quantity of raw material, if they sense an increase in the price of it in the future.

**17.4.2 WORK-IN-PROGRESS (WIP):** It is term as semi finished goods. It is the types of goods on which some works are done but they need to further go in the production process in order to manufacture final product. Like- in construction business, doors, windows and fittings are the W-I-P goods which need to fit in the buildings.

**17.4.3 FINISHED GOODS:** Finished goods are ready materials which are good to sold in the market. The firm holds these types of stock with them so that as and when the product is demanded by the customers, they can be readily available with them. Finished products are requisite in smooth functioning of marketing operations.

## 17.5 THE MOTIVE BEHIND HOLDING INVENTORY

Holding an inventory is a cost to the organization. The firm has to invest the fund to procure the raw material, require proper storage to keep them in a safe and proper condition and also take care of them to refrain inventory from any wear and tear or spoilage. Despite these costs, it is imperative for any manufacturing firm to hold inventories, because of the following motives-

**Transaction Motive**- It underlines the purpose of keeping up stock to encourage smooth operation, and sales activities.

If the raw material or semi-finished goods are not available at the time of production, it hampers the operation of the business and can be detrimental of the business. So, it is essential to provide raw material instantly whenever required so that there should not be any delay in the production.

**Precautionary Motive**- The firm holds the stock with them to avoid any untoward change in the demand and supply situation. Suppose, because of the strike, on bad weather in case of agricultural product, raw material cannot be source, in that case the firm will have to halt the operation, which in turn results in short supply of the product ion the market.

Likewise, if there is sudden spurt of demand of the product in the market and if the stock of finished product is not available with the firm, the will have to lose the customer. To not to caught in these types of situations, firms prefer to keep the stock with themselves.

**Speculative Motive**- Sometimes, firms hold the stock to take advantage of the price fluctuations. Like, confectionary firms purchase potatoes in bulk to take advantage of low price at the time of harvesting.

## 17.6 OBJECTIVES OF INVENTORY MANAGEMENT

The motivation behind the inventory management is to maintain the stocks in such a manner so that there will be neither over stocking nor under stocking. The aim of inventory management is to make the raw material and W-I-P accessible to the production process in adequate amount so that work isn't interrupted for need of stock and also, provides finished products to the sales team in desired numbers/quantity. According to I.M. Pandey-

"Both excessive and inadequate inventories are not desirable. Therefore, optimum level of inventory will lie between the two danger points of excessive and inadequate inventories".

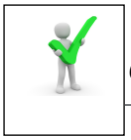
According to L.R. Howard "The efficient management of inventories enables the industries to achieve better working results and reduction in working capital. An undertaking neglecting the management of inventories will be jeopardizing its long-term profitability and may fail ultimately. It is possible for an undertaking to reduce its level of inventories to a considerable degree e.g. 10% to 20%, without any adverse effect on production and sales, by using simple inventory planning and control techniques".

The firms need to make a trade off in two conflicting decisions-

a) Maintain a size of raw material enough to not to hamper the production flow and finished goods to support seals operations and
b) The minimum level of fund to minimize the cost of the production.

The following are the objectives of Inventory Management-

a) To maintain company inventory at an appropriate level to escape from excessive or shortage of stock.
b) To maintain inventory at the proper level so that production and sales going smooth.
c) To provide the accurate quantity and quality of goods in time and at right time.
d) To minimize wastage, damages, theft etc.
e) To minimize carrying and ordering costs of inventory.
f) To design the proper organizations for Inventory Management.



***Check Your Progress-A***

**Q1. What is inventory?**

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**Q2. What are the types of inventory?**

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**Q3. What is transaction motive of holding inventory?**

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## 17.7 COST ASSOCIATED WITH HOLDING THE INVENTORY

Though, holding stock provides a safety net to the firms against any untoward situations, it also attracts cost tied with it.

### 17.7.1 ORDERING COST

It is also known as setting cost. These are the variable expenses of submitting a request to purchase the raw material. Requests are set by the firm to replenish the stock of raw material, which are ought to go into production process. Ordering costs incorporate the expense of asses the quantity or number of the goods required, ordering, examining and getting. The ordering cost change in relation to the number of orders placed. They likewise incorporate administrative expenses and stationery costs (That is the reason it is known as a set-up cost.). Although, these expenses are nearly fixed in nature, the bigger the order set, or the more continuous the procurement of inventory made, the higher are such expenses. Also, the less the requests, the lower the request cost will be for the firm. In this way, the ordering/acquisition costs are contrarily identified with the degree of inventory.

### 17.7.2 CARRYING COST

Carrying costs, otherwise called holding cost and inventory carrying costs, are the costs a business pays for holding inventory. A business can bring about an assortment of carrying costs, including charge of taxes, insurance charges, representative costs, devaluation, the expense of keeping goods in proper condition, the expense of risk of spoilage of short-lived things and opportunity costs. Opportunity cost, here, is defined as the fund, which is tied in holding inventory, which could be otherwise used in the other productive activates.

## 17.8 ADVANTAGES AND DISADVANTAGES OF INVENTORY MANAGEMENT

### 17.8.1 ADVANTAGES

a) Every material can be obtained in the most affordable amount. Because if customer wants that product in bulk in that case possibility of discount are also there.
b) Buying and stock control individuals consequently gives their consideration regarding those things which are required just when are needed.
c) Positive control can maintain inventory at the ideal level just by computing the foreordained greatest and least qualities.
d) It facilitates regular and timely supply to customers through adequate stocks of finished products. If our order is delivered on time to the customers then it will be good for the company.

### 17.8.1 DISADVANTAGES

a) If inventory is more in the company then more space is required and the spaces are accounts for rent.
b) Chances of damage are also there.
c) Insurance charges are also increased
d) Sometimes order is placed at an inappropriate time then it will not be good for the company or the suppliers.
e) Increased chance of obsolesce

## 17.9 EOQ MODEL

Economic Order Quantity (EOQ) is the ideal quantity ordered for an organization should buy to limit stock costs, for example, holding costs, shortage costs, and order costs. This model was created by Ford W. Harris in 1913 and has been refined several times. The economic order quantity is a noteworthy idea in acquisition of raw materials and in the capacity of finished goods and in-transit inventories. In this framework of ordering, the quantity to be ordered is resolved with the assistance of 'EOQ' equation which considers three variables:

a) Handling of the materials during the given time frame

b) Ordering cost; and

c) Carrying cost of stock

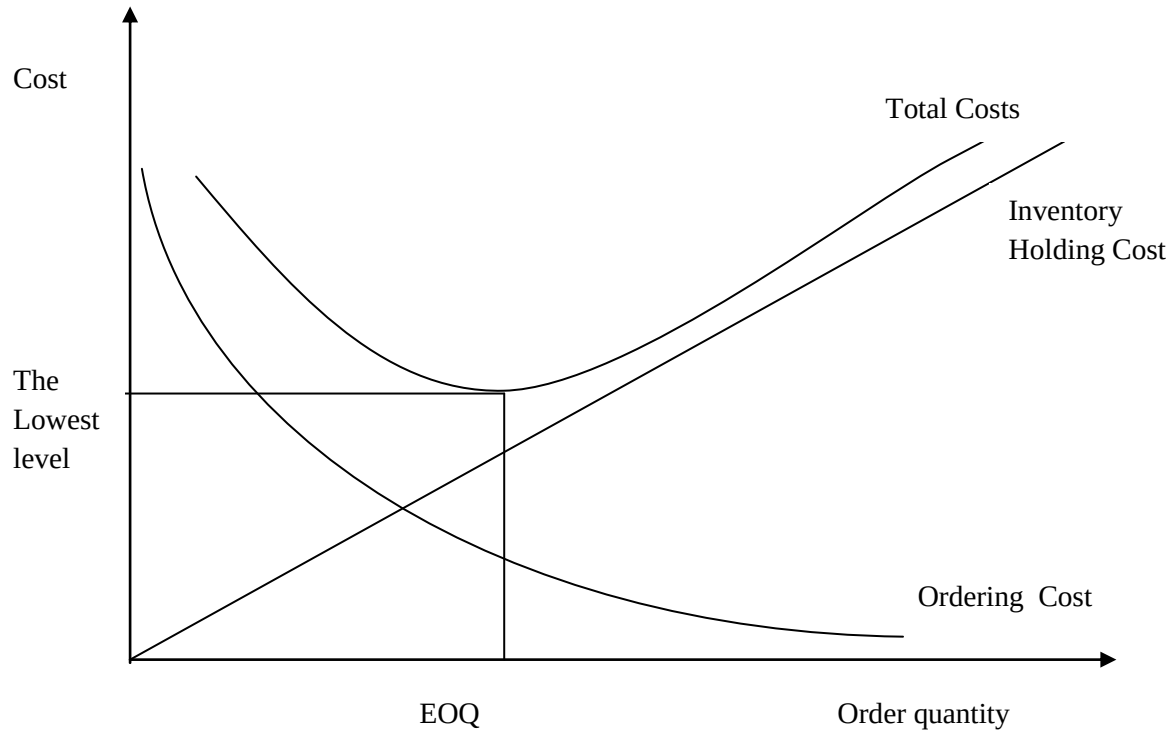



**Fig 17.1 EOQ Graphical Representation**

**Assumptions**

The EOQ model works under following assumptions

i) Demand remains constant

The model assumes that the demand of the product remains same. Because the demand of the product remains same, so the quantity of the production also constant and the requirement of the raw material is same. This model also assumes that as the stock exhaust, new stock arrives just at time, therefore, no requirement of safety stock.

ii) Delivery is Immediate-

This model also assumes that as the stock exhaust, new stock arrives just at time; there is no delay in delivery. Because there is no delay in delivery, therefore, no requirement of safety stock.

We experience in our real life that because of strike, unavailability of the product etc, there is a time lag, so the firm need to keep a safety stock with them.

iii) Constant Ordering Cost

It says that whatever is the size of order, the ordering cost remains constant.

iv)Constant Carrying Cost

On the same line, this model assumes that carrying cost is fixed as a percentage of the inventory. There is no percentage change in carrying cost, if the size of inventory increases or decreases.

v) Purchase Price remains Constant

One of the assumptions of this model is constant unit price of the raw materials. It does not consider the change in the price of the products because of any reason.

But in real life, there are fluctuations in the price because of inflation, availability of the product in the market, quantity of the product- in small quantity or in bulk, etc.

Formula:

$$EOQ = \sqrt{2XDXS/H}$$

Where

Q= EOQ units

D= ordered units (annual basis)

S= per unit cost

H= holding cost

The objective behind EOQ formula is to distinguish the ideal quantity of item to be arranged. Whenever accomplished, a business can limit its costs for purchasing, conveyance, and putting away units. The EOQ equation can be changed to decide diverse generation levels or order intervals, and organizations with huge stock chains and high factor costs utilize a calculation in their computer programming to decide EOQ.

The EOQ is a significant cash flow tool. The equation can enable an organization to manage the measure of money tied up in the inventory equalization. For some of the organizations, stock is considered as most important resource other than its human resources. So these organizations must suggest adequate stock to address the issues of clients. On the off chance that EOQ can helps in limiting the level of inventory, the reserved funds can be utilized for some other different business reasons or investment.

The EOQ framework finds some kind of balance between the ordering cost and carrying cost what's more, recommended the optimal order quantity for which order ought to be put. The economic order quantity is that inventory level which minimizes the aggregate of ordering costs and inventory costs.

**For example-**

A shoes shop conveys a line of kid's shoes, and the shop sells 600 pairs of shoes every year. It costs the organization Rs.5 every year to hold a couple of shoes in stock, and the fixed cost to put in an order is Rs 15.

The EOQ formula is the square root of (2 x 600 sets x 5 order cost) divided by (15 holding cost) equals to 400. The ideal order size to limit expenses and fulfill customer need is marginally in excess of 400 of shoes.

**Re-order point**

EOQ solves the problem-how much to order? Now, the question rises is- when to order? A firm must decide that level of inventory at which firm should place an order to replenish the inventory, so that the remaining stock does not reaches to zero. The level of inventory at which the order is placed is called reorder point and time between placing an order and arrival of the same called lead time.

In EOQ model, under the assumption of certainty, the reorder point is simply –

The average demand (d)* Lead Time (L)

If the average demand – 150 Units

Lead time is- 7 Days

Reorder point= d*L

=150*7= 1050 units

So, when the current stock level reaches to 1050 units, the firm should place an order.

**Safety stock**

EOQ model assumes that there is certainty. It assumes that the order will reach on the exact time and the production happen at a uniform rate. But, in real life, there is many a reason, because of which it seldom happens. If the order does not reaches on time or if the consumption of raw material increases to meet the raised demand the firm will have to face the situation of stock out.

The situation of stock out not only put a hindrance on the production side; it also jeopardizes the reputation of the firm. Safety stock provides a cushion to observe the shock of stock out. But, again, it involves carrying cost. A firm must strike a trade off between the stock out cost and carrying cost.

Safety Stock= (Maximum Daily uses+ Maximum Lead time)- (Avg. daily uses-Avg. lead time)

Ex- If the daily uses vary between 40 units to 80 units and the maximum possible lead time is 40 Days

Safety Stock= (80*40)- (60*20)

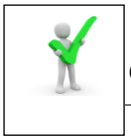
=3200-1200=3,000 units

In case of maintaining safety stock, the reorder point would be

Reorder point= (Lead time*Average Uses) + Safety Stock

= (40*60) +3,000

=2,400+3,000= 5,400 units



***Check Your Progress-B***

**Q1. What is inventory planning?**

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**Q2. Discuss five objectives of inventory planning?**

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**Q3. What is ordering cost and safety stock.**

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**Q4.Difference between inventory control and management.**

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## 17.10 INVENTORY MANAGEMENT SYSTEM

Inventory management system is the way of managing and controlling inventory of any organization. It includes various methods like ABC analysis, VED, JIT analysis.

**ABC Analysis**:

One of the most preferable techniques in inventory control system is called ABC which implies *"Always better control"* analysis. This analysis is based on annual consumption of inventory items in a year. It helps in reducing working capital and carrying costs

The analyses differentiate the product into three categories: A category defines the high consumption valued product, B defines medium consumption valued product and C defined the least consumption valued product.

- ✓ To calculate the value of annual usage can be calculated from following formula-

(Annual consumption value = per order cost X Annual ordered item)

The following table presents the number of items and inventory value under ABC analysis.

| Category | %of total item | % of total cost of inventory | Control required |
|---|---|---|---|
| **A** | 5-10 | 70-75 | Efficient control |
| **B** | 20-30 | 10-25 | Usual control |
| **C** | 60-70 | 5-15 | Developed from experience |

✓ **Steps in calculating cost in ABC analysis**

Following are the steps involved in ABC analysis

(a) Calculate annual consumption value of per item by multiplying the cost of each item.
(b) Organize the item in descending order according to the consumption value.

(c) Calculate percentage of total consumption cost of each item.
(d) Compute the average inventory of each item by dividing the consumption cost with 2 and total number of orders.

Advantages of ABC Analysis-

- Perfect control over costly items
- Efficient planning
- Maintain the stock at optimal level
- Focus on reducing storage expenses
- Helps in planning stocks, results to it firm prevent from unnecessary and surpluses.

**Just In Time Analysis:**

Another important technique in inventory management system is Just in Time (JIT) analysis. The just-in –time techniques was originally developed by Taichi Okno of Japan, basically this analysis implies that the firm should maintain minimum level of inventory at any stage of production. And the firm should rely on suppliers to provide requirements immediately at any stages of production. This technique is also known as "zero inventory", "materials as requirement". Just-in –time is contrast to traditional inventory management known as 'just-in-case' system, which advice the firm, should maintain stock on large scale in order to meet emergency of materials at any time. Whereas 'just-in-time' advocates providing material when internal, external or customer needed, hence it reduces the inventory and cost related to it.

Difference between inventory management and inventory control:

Inventory management means to manage the stock like how much, when etc., and coordination and formulation of orders Whereas Inventory control means maintaining balance between providing materials and efficient utilization of stock.

Objective of JIT analysis-

- Efficient stock management
- Produce efficient output with minimal waste
- No warehouses
- Supply of exact number of product at required time
- Reduce lead time
- Secure and competitive pricing

**VED Analysis:**

This analysis is known as "Vital, Essential, and Desirable analysis. In this techniques the products are categorize according to the critical value and shortage cost of an item:

Vital: means where shortage of spare parts cannot be acceptable. Vital spare parts are stocked sufficiently to make sure smooth operation.

Essential: spare part will be considered essential, which is for efficient running of operations. Therefore, it is necessary to keep adequate arrangement of stock in order to meet urgency at short notice.

Desirable: Here there is no need to stock spare part; it can be bought easily from the market when parts are required. Its non-availability neither stops the operation nor reduces its efficiency.

Basically VED analysis helps in smooth functioning of operation by managing and controlling rare spare parts. It is very beneficial for capital intensive and transport industries. According to Gopalkrishnan and Sundaresean VED analysis and ABC analysis can be combined to control the stocking of spare parts. Following matrix shows the combination ABC and VED analysis-

| | V | E | D | | Item | Cost |
|---|---|---|---|---|---|---|
| A | AV | AE | AD | Category 1 | 10 | 70% |
| B | BV | BE | BD | Category 2 | 20 | 20% |
| C | CV | CE | CD | Category 3 | 70 | 10% |

Category 1: Require efficient monitoring and controlling

Category 2: Moderate control

Category 3: No need for controlling

## 17.11 SUMMARY

An inventory is a stock of materials used to facilitate production or to satisfy customer demands. Inventories include raw materials, work-in-progress, and finished goods. Broadly, based on the manufacturing firms, inventory is categorized into raw mate-rial; semi-finished goods and finished products. Holding an inventory is a cost to the organization. The motivation behind the inventory management is to maintain the stocks in such a manner so that there will be neither over stocking nor under stocking. Cost associated with holding the inventory

Ordering Cost- It is also known as setting cost. These are the variable expenses of submitting a request to purchase the raw material.

Carrying Cost- Carrying costs, otherwise called holding cost and inventory carrying costs, are the costs a business pays for holding inventory. Functions of inventory management: protection against uncertainties, to cover anticipated changes, to provide cushion, display motivational information, reduce surpluses, effective use of capital, maintaining and promoting efficiency etc.

Economic Order Quantity (EOQ) is the ideal quantity ordered for an organization should buy to limit stock costs, for example, holding costs, shortage costs, and order costs.

Techniques and Methods of Inventory Control ABC analysis, Just in Time, VED analysis.

ABC analysis- ABC implies "Always better control" analysis. This analysis is based on annual consumption of inventory items in a year. It helps in reducing working capital and carrying costs

Just-in –time techniques basically this analysis implies that the firm should maintain minimum level of inventory at any stage of production. The firm should rely on suppliers to provide requirements immediately at any stages of production.

VED analysis- This analysis is known as "Vital, Essential, and Desirable analysis. In this technique the products are categorize according to the critical value and shortage cost of an item.

## 17.12 GLOSSARY

**WIP:** Work-in-Progress

**EOQ:** Economic Order Quantity

**AUC:** Average Unit Cost

**Lot Size:** The total number of items ordered for specific date in single production unit.

**PO:** Purchase Order

**ABC:** Always Better Control

**VED:** Vital, Essential, and Desirable

**JIT:** Just in Time

## 17.13 REFERENCES


- Chandra Prasanna, Financial Management- Theory and Practices, Tata McGraw-Hill Education, 2019
- Khan, Jain., Indian Financial Management, Tata McGraw-Hill Education, 2018
- Muller Max, Essentials of Inventory Management, Harper Collins Publishers. 2011


## 17.14 SUGGESTED READINGS


1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.


## 17.15 TERMINAL QUESTIONS

Q1. What is inventory? Why it is said that inventory management is a strategic decision?
Q2. Discuss the types and motives behind holding the inventory.
Q3. Discuss EOQ model of inventory management. Provide a critical analysis of this model.
Q4. Discuss the following techniques of Inventory management:
a) JIT analysis
b) VED analysis

Q5. Discuss the process of ABC analysis.
Q6. What is inventory management system?
Q7. What is ABC analysis?
Q8. What is VED analysis?
Q9. Differentiate between inventory management system techniques.
Q10. Explain the objective and importance of inventory management system.
Q11. What is the importance of inventory management?
Q12. A company makes motorbikes. It produces 550 bicycles a month. It buys the tries for bicycles from a supplier at a cost of $15 per tire. The company's inventory carrying cost is estimated to be 10% of cost and the ordering is $55 per order.
**a)** Calculate the EOQ, **b)** Calculate the number of orders per year? **C)** Calculate the average annual ordering cost, **d)** Compute the average inventory. **e)** What is the average annual carrying cost? **F)** Calculate the total cost
Q13. We need 2,000 tyre per year. The ordering cost for these is $90 per order and the carrying cost is assumed to be 45% of per unit cost. In orders of less than 120, tyre cost $78; for orders of 120 or more, the cost drops to $50 per unit.

Should we take advantage of the quantity discount?

Q14. Malhotra Corp sells 1,500 of its special road light switch per year, and places orders for 400 of these switches at a time. Assuming no safety stocks, Malhotra estimates a 50% chance of no shortages in each cycle, and the probability of shortages of 5, 10, and 15 units as 0.2, 0.15, and 0.15 respectively. The carrying cost per unit per year is calculated as $6 and the stock out cost is estimated at $8 ($3 lost profit per switch and another $5 lost in goodwill, or future sales loss). What level of safety stock should Malhotra use for this product? (Consider safety stock of 0, 5, 10, and 15 units)
Q15. Presume that Malhotra carries a modern decorator lamp that is quite popular. The anticipated demand during lead time can be approximated by a normal curve having a mean of 200 units and a standard deviation of 40 units. What safety stock should Malhotra carry to achieve a 95% service level?

# UNIT 18 RECEIVABLES MANAGEMENT



## 18.1 INTRODUCTION

To achieve the growth in sales and to meet competition in the industry a firm may resort to a sale on credit, companies offer credit to customers to attract more business, and the increased turnover will result in increased profit to the firm. Sales on credit depends upon the nature of the business, to increase the sales volume, generally the credit facility will be offered to the customers which results in investment in receivables to maximise return on capital invested.

Many firms offer "Buy now and pay later" to their customers the ability to take advantage of goods and services, putting efforts to offer their customers the ability to take advantage of goods and services now and pay further down the road. The term for keeping track of what customers buy on credit from a company is called receivables management. It takes a special role in many modern businesses & Financial Management.

A business can lose everything with poor receivables management during the last phase of the sales process (payment). Over half of all bankruptcies can be attributed to poor receivables management, which demonstrates its importance. Receivables management involves much more than reminding customers to pay. It is also about identifying the reason for non-payment. Perhaps a product or service was not delivered? Error in Invoice, delay in dispatching Invoice, is there any product default? etc

## 18.2 OBJECTIVES

After studying this unit, you will be able to understand the following;

- Explain the Nature of Receivable Management
- Understand the objective, benefits and Costs of Receivable management.
- Discuss the aspects of Credit Policy, collection policy, credit evaluation process.
- Understand the credit policy variables.
- Concept of Credit scoring and Credit scoring factors

## 18.3 CONCEPT OF RECEIVABLES MANAGEMENT

The word receivable stands for the amount of payment not received, it's money that a company has a right to receive because it has provided a product or service. However, the company has not received the money yet. Usually, the company sells its goods and a service both in cash as well as on credit, Receivables arises from sale of goods and services on credit basis. Example: State Electricity Company that bills its clients after the clients received the electricity, the electric company records an account receivable for unpaid invoices as it waits for its customers to pay their bills.

Receivables Management refers to the set of policies, procedures, and practices employed by a company with respect to managing sales offered on credit. It encompasses the evaluation of client credit worthiness and risk, establishing sales terms and credit policies, and designing an appropriate receivables collection process.

### 18.3.1 OBJECTIVES OF RECEIVABLE MANAGEMENT

Credit is the soul of business, Credit facilities are important for attracting and retaining customers and this makes management of credit facilities by business crucial. Objectives of receivable management are as follows:

a) **Boost up sales volume**
   By extending the credit facilities to their customers business are able to boost up their sales volume. More and more customers are able to do transactions with the business by purchasing products on a credit basis. Receivable management helps business in managing and deciding their investment in credit sales. This leads to increase in the number of sales and profit level.

b) **Monitor and Improve Cash Flow**
   Receivable management helps business in deciding appropriate investment in trade debtors. It aims that a sufficient amount of cash needed for day-to-day activities is maintained at business. Credit facilities are extended by doing proper analysis and planning to ensure optimum cash flow in a business organisation.

**c) To Minimises bad debt losses**

Receivable management takes all necessary steps to avoid bad debts in business transactions. It designs and implement schedules for collection of outstanding amount timely and informs the collection department on due dates. Customers are notified for amount standing against them and charges interest on delay in payments.

**d) Avoids invoice disputes**

Disputes adversely affect the relationship between customers and business organisations. Complete and fair record of all transactions with customers is maintained on a daily basis. There is no chance of confusion and dispute arising as all sales transactions are accurately maintained. Automated receivable management systems present full evidence in a short time in case of dispute arising for resolving them. Receivable management has an efficient role in avoiding any disputes arising in business.

**e) Improve customer satisfaction**

Customer satisfaction and retention are key goals of every business. By lending credit, it supports financially weaken customers who can't purchase business products fully on a cash basis. This strengthens the relationship between customer and organisation. Customers are happy with the services of their business partners. Receivable management help in organising better credit facilities for their customers.

**f) Helps in facing competition**

Receivable management is very important for facing stiff competition in the domestic and global market. Most of the competitors existing in market offer different credit options to attract more and more customers and customers are provided better services by extending credit at convenient rates. Receivable management process include analysis all information about market and helps the business in framing its credit lending policies. Appropriate amount and rates of credit transactions can be easily decided through receivable management process. All credit and payment terms are decided for every customer as per their needs. Example: Credit card credit, EMI credit, Cash credit, Loans and advance, Zero Interest Credit etc.

Receivables management involves much more than reminding customers to pay. It is also about identifying the reason for non-payment.

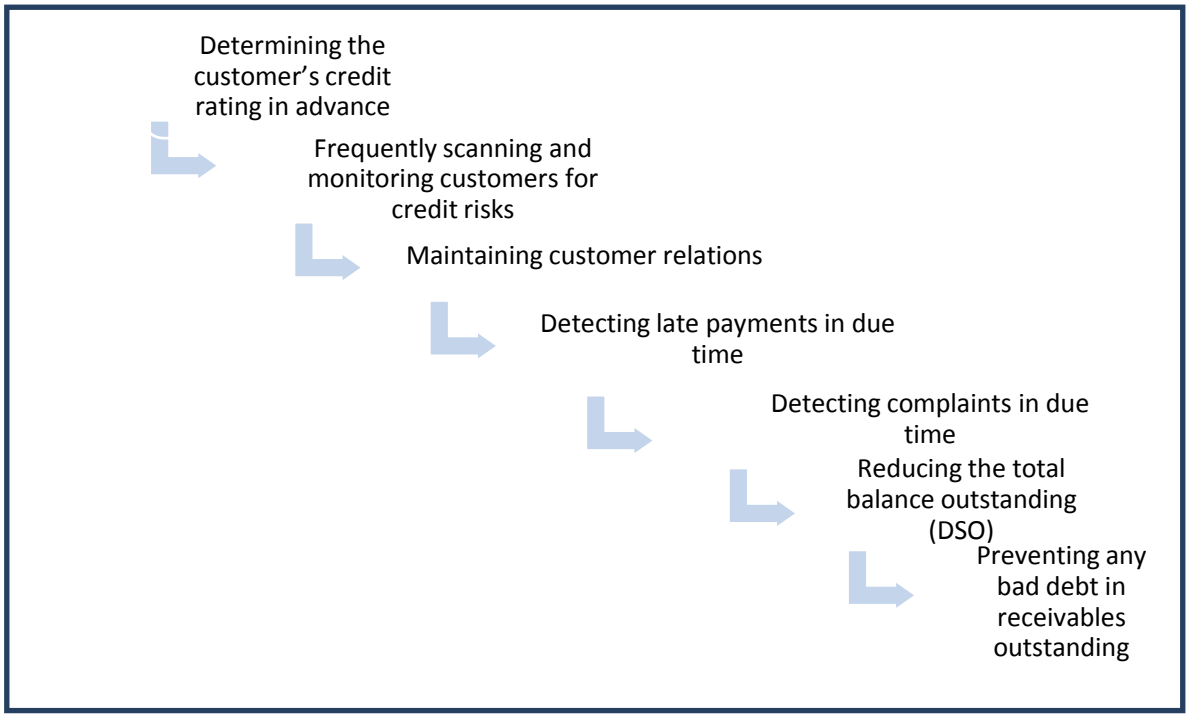



**Fig 18.1 Process of Good receivables management**

## 18.3.2 FACTORS INFLUENCING THE SIZE OF INVESTMENT IN RECEIVABLES

### a) Level of Sales:

The primary factor in determining the volume of receivables is the level of credit sales. Increase in credit sales means a corresponding increase in debtors, and vice versa. No doubt the level of sales can be used to forecast changes in receivables, i.e., if a firm predicts an increase of 50% in its credit sales for the next period, it will probably experience also an increase of 50% in receivables.

### b) Firms Credit Policy

The firm can adopt two types of policies such as lenient and stringent credit policy. A firm that is following lenient credit policy tends to sell on credit to customers very liberally, which will increase the size of receivables, and the firm which follows the stringent credit policy will have a low size of receivables.

**c) Terms of trade**

The period for which the credit is allowed will decide the extent of receivables. Longer the period of credit more would be the receivables. Again, cash purchases followed up with credit sale is the main reason for increasing receivables.

**d) Paying practices of customers**

The paying habits of customers also have bearing on the size of receivables. The customers may be in the habit of delaying payments even though they are financially sound. The concern should remain in touch with such customers and should make them realise the urgency of their needs.

**e) Development and expansion plans**

When the firms want to expand or to enter new markets and to attract new customers it becomes necessary for the enterprise to provide incentives in terms of credit. Once the firm gets the permanent customers it may start reducing the period for which credit was allowed.

**f) Credit collection efforts**

A firm must have strong and well equipped credit collection system and process. Periodical reminders should be sent to customers in order to reduce the size of outstanding. Delayed collection will increase receivables and will impose serious financial troubles for the company.

**g) Endorsing & Bills Discounting**

Bill discounting and endorsing the bill to the third party will reduce the size of investments in receivables. If the bills are dishonoured on the due date, investments in receivables will increase because the discounted bills or endorsed bills have to be paid by the firm.

# 18.4 CREDIT & COLLECTION POLICIES,

## 18.4.1 CREDIT POLICY

Credit policy is an important part of the overall strategy of a firm to market its products. It refers to those decision variables that influence the amount of trade credit. A firm's credit policy comprises regarding its credit standards, credit period, cash discounts, and collection procedures.

**Types of Credit Policy**

**a. Lenient Credit policy**

This is also called as an Expansive Credit Policy , Under this policy seller sells goods and services on very liberal credit terms, conditions and standards or goods sold to the customers whose credit worthiness in not up to standards or whose financial position is doubtful.

Advantages of Lenient Credit policy

i. Increase in Sales: Lenient Credit policy helps to increase the sales because of the liberal credit terms and conditions & favourable incentives granted customers.

ii. Higher Profits: Increase in sales leads to increase in profits, because higher level of production and sales will reduce the fixed cost

Disadvantages of Lenient Credit policy

i. Liquidity : Lenient credit policy creates the liquidity problem, because if the firm is not able collect the payment or received the payment on time, it may create a problem for future or current maturing obligations

ii. Bad debt Loss: A firm that follows a lenient credit policy may suffer from Bad debt losses that arise due the non-payment on credit sales.

**b. Stringent Credit Policy**

Under this policy firms pay strict attention to rules, procedure, and detail, related to credit. A firm offers a credit to the customers who have proven creditworthiness and financially sound.

Advantages of Stringent Credit Policy

i. Less Bad Debts: A Firm which adopts the stringent credit policy will have minimum bad debts losses, because it has granted credit to only the customers who are creditworthy.

ii. Sound Liquidity: A firm will have sound liquidity position due to the receipt of all payments from customers on due date, so the firm can easily meet the future obligations.

Disadvantages of Stringent Credit Policy

i. Less Sales: Stringent Credit Policy restricts the sales, because it is not extended credit to the average credit worthiness of customers.

ii. Less Profit: Less will automatically reduce the profits, because firm may not be able to use the resources efficiently that leads in increase in production and sales.

## 18.4.2 CREDIT POLICY VARIABLES

Optimum credit policy is one which maximise the firms operating profit, for optimum credit policy the firm must consider the important decision variables like credit standards, credit terms and collection policy and procedure, credit evaluation Process.

### a) Credit Standards:

The firm's credit standards would be applied to determine which customers qualified for the regular credit terms, and how much credit each should receive. The major factors considered when setting credit standards relate to the likelihood that a given customer will pay slowly or perhaps end up as a bad debt loss.

Credit standards refer to the financial strength and creditworthiness a customer must exhibit in order to qualify for credit. If a customer does not qualify for the regular credit terms, it can still purchase from the firm, but under more restrictive terms. For example, a firm's "regular" credit terms might call for payment after 30 days, and these terms might be offered to all qualified customers.

### b) Credit terms

The second decision criteria in receivables management is credit terms, it means the stipulation under which good and services are sold on credit to the customers, one the credit terms has been finalised and established the creditworthiness of the customers can be assessed. Need to decide the terms and conditions also for the same. It must include the credit period, cash discount and the cash discount period.

### c) Collection Policy

Collection policy defined as" A collection policy is the set of procedures a company uses to ensure payment of overdue accounts receivables". Generally, a collection policy systemizes the steps taken to recover amounts due prior to litigation.

This includes when a customer should be contacted, how they should be contacted, how disputes are resolved, when internal or external "collectors" are used to step-up collection efforts, and ultimately when and whether to turn the account over to litigation or write-off the debt. Each individual business will likely want to treat the collection policy in a different way – some are much quicker to send a sternly worded letter or firm phone call upon late payment, and some will let the account simmer for a short period of time.

The collection process can be expensive in terms of both out-of-pocket expenditures and lost goodwill—customers dislike being turned over to a collection agency. Collection policy refers to the procedures the firm follows to collect past-due accounts. For example, a letter might be sent to customers when a bill is 10 days past due; a more severe letter, followed by a telephone call, would be sent if payment is not received within 30 days; and the account would be turned over to a collection agency after 90 days. However, at least some firmness is needed to prevent an undue lengthening of the collection period and to minimize outright losses.

A balance must be struck between the costs and benefits of different collection policies. Changes in collection policy influence sales, the collection period, and the bad debt loss percentage. All of this should be taken into account when setting the credit policy.

Collection policy goals can take a liberal or conservative approach to collections, allowing that to define their collections procedures. A business that takes a more liberal approach will

be more flexible and willing to work with a delinquent account while a more conservative approach will require strict adherence to credit guidelines.

| Age past Due | Action |
|---|---|
| **45 days** | **Collection call /Letter #1- seek a commitment for payment and a time frame for when it will be sent** |
| **60 Days** | **Letter #2 – It questions the reasons behind their lack of communication and informs them that to keep the account in good standing payment must be made immediately.** |
| **75 Days** | **Collection call – Trying to negotiate some type of payment arrangement that will keep it from being necessary to place the account on credit hold.** |
| **90 Days** | **Collection Call/ demand letter – It makes it clear our intent to take alternative action if full payment is not sent immediately.** |

**Table 18.2 Time line for collection policy**

The collection process can be expensive in terms of both out-of-pocket expenditures and lost goodwill—customers dislike being turned over to a collection agency. Collection policy refers to the procedures the firm follows to collect past-due accounts. For example, a letter might be sent to customers when a bill is 10 days past due; a more severe letter, followed by a telephone call, would be sent if payment is not received within 30 days; and the account would be turned over to a collection agency after 90 days. However, at least some firmness is needed to prevent an undue lengthening of the collection period and to minimize outright losses.

A balance must be struck between the costs and benefits of different collection policies. Changes in collection policy influence sales, the collection period, and the bad debt loss percentage. All of this should be taken into account when setting the credit policy.

A firm should finalise the decision relating to credit period only after Cost Benefit Analysis. If the change in net profit is positive it is better to go with proposed credit period and *vice versa.*

**Illustration 1:** Trimurti Pvt Ltd currently provides 20 days to its customers. Its current sales level is Rs 5, 00,000. The Cost of capital is 12% and the tax rate is 40%. The ratio of variable cost to sales is 75%. Trimurti ltd is considering extending its credit period by 40 days, such an extensions expected to increase by Rs 1, 00,000 and also increase the bad debts portion on new sales would be 5%. Determine the residual income and suggest whether the company should consider the relaxation of credit period or not.

**Solution**

| **Particulars** | **Amount(RS)** |
|---|---|
| Increased sales | 1,00,000 |
| Less Variable Cost(1,00,000 X 0.75) | 75,000 |
| **Contribution** | **25,000** |
| Less: Bad Debts loss on new sale(1,00,000 X0.05) | 5,000 |
| **Earnings before Interest and Tax** | 20,000 |
| Less Tax at 40% | 8,000 |
| **Earning After Tax** | 12,000 |
| Less opportunity cost | 6750 |
| **Residual income** | 5,260 |
| | |

**Working Notes**

Calculation of opportunity cost

Opportunity cost = Increase in investment X Cost of capital

Calculation of increase in Investment (DOS X NACP) + DVCIS X ACPn)

= (1369.86 *40) + (205.48*60) = Rs 67,123.2

DOS = RS 5,00,000/356 = Rs 1369.86

NACP = 60 -20 =40 days

DVCIS = (RS 1,00,000 X 0.75) / 365 = Rs 205.48

Opportunity cost = Rs 67,123.2 X 0.12 = Rs 8054.78

Where

DOS = Daily old Sales

NACP = Net average collection period = New Average collation period – Old average collection period

DVCIS = Daily variable cost of incremental sales =( incremental sales X variable cost PU)/365

ACPn = New average collection period

**Interpretation: Trimurti Ltd can extend the credit period, since the residual income is positive.**

**d) Credit Evaluation Process**

Credit Evalution Process is one of the most essential parts of the entire credit collection plan and how detailed firm get will depend on the size of the firm and its credit philosophy. Something general could be: "The Credit and Collections Department will evaluate and determine appropriate terms and credit limits for all accounts. Decisions will be based on references, payment histories and alerts obtained through The Credit Collective and Financials submitted by the customer. No credit scoring methods will be used. Should the account go beyond terms, the credit and collections department will utilize its best judgment and industry accepted practices to collect the debt." A more formal approach to this process could actually spell out procedures for credit limit ranges e.g., limits between Rs500 – Rs 5,000 is a no-score method, limits between Rs 5,000 - Rs10,000 utilizes both the no-score method and a D&B or Experian report, orders above Rs.10,000 require all of the preceding plus current customer financials.

## 18.5 ANALYZING CREDIT-WORTHINESS

Credit Analysis is the process of studying the credit worthiness of customers. Takes into account a range of information related to the buyer or customers, its environment and commercial stakes for your company. This analysis leads to a specific strategy with each customer and will have some effects on trade negotiations and commercial terms (payment terms, warranties, contract ... etc..)

a) **Creditworthiness of the buyer:** Creditworthiness of the buyer with the completion of a financial analysis of its balance sheet and its income statement. Behavioural references of the buyer: does he meet with its commitments? What is his payment behaviour? Commercial references of the buyer. Is he a business with great potential? Does he have a favourable market positioning? What is his age? In case of organisation need to consider legal form of the company. Is it a private or public company?

**b) About the environment of the buyer:**

Sector risk: the customer is his part of a sector in crisis or supporting? Country risk: does the country of the buyer have a significant political risk that could affect the progress of the business case? Currency risk for export to a country which has another currency and if the contract is signed with the buyer's currency.

c) **Locate the credit analyst in the Organisation**

Depending on the size of the firm, the credit analysis is performed by a qualified analyst, Credit Manager or a person trained belonging to the financial department (Chief Financial Officer, Accounting ... etc..). He is responsible for credit granted to customers and must be attached to the Finance Department.

In large firms or organisations, he defers to the Credit Manager who negotiates with trade customers and sales managers and then ratifies decisions based on credit analyses performed.

**d) Financial Analysis**

The financial analysis is the cornerstone of the valuation of the solvency of customers, suppliers, B2B Clients. The most important is: the understanding of the balance sheet and of the profit and loss account, their analysis with key indicators.

The profit and loss account highlights the turnover accomplished over period given (usually one year) from which it subtracts expenses supported by the business during the same period. The result of this subtraction shows the benefit or the loss made by the company at the end of the financial year. The following are the important indicators financial position.

| | |
|---|---|
| **Gross Revenue** | Gross Revenue gives information about size of the business and evaluation of it financial activity which is link with balance sheet: what financial resources the company owns to support the evaluation of its gross revue. |
| **Earnings Before Interest and Tax** | EBIT shows the profitability of the activity of the firm by comparing the operation revenue with the operation expenses. |
| **Net Income** | The net income is the result of the revenue generated during the financial year less the total expenses supported by the company. |

**Table 18.3 Important indicators financial position.**

Most of the time comparing the evolution of the turnover and the profitability on last 3 financial years (5 so possible) to determine the medium-term viability of client or customer will help to understand the credit worthiness in excellent way.

Following indicators help to determine if the company is profitable and to understand what are the main factors contributing to the net result (positive or negative).

| Sr. No. | Interpretation | Calculation | Intermediate balance |
|---|---|---|---|
| 1 | The net income represents the | Result before tax + | Net income(profit or |

| | | | |
|---|---|---|---|
| | profit or loss at the end of the year (the difference between total revenue and total expenditure). It is increasing (if positive) or decreasing (if negative) the equity. If positive, it can remain invested in the company or be partially distributed to shareholders as dividends. | exceptional result - income tax | loss) |
| 2 | This result relates to unusual activity. For example, a capital structure transaction can create an exceptional result. Be careful because it can distort the true profitability of the business and distort an analysis that would be based solely on net income. | Exceptional income - Exceptional expenses | Exceptional result |
| 3 | Final result calculated from operating income and expenses. It is independent of taxation and exceptional income and expenses. | Operating profit + financial result | Result before tax |
| 4 | This purely financial result is often negative because firms are generally consumers of financial products (lines of bank overdrafts, bank loans, factoring etc ...). A significant negative financial result often reflects a weak financial structure and an excessive recourse to banks. Warning! | Financial income - financial charges | Financial result |
| 5 | Operating profit includes the amortization of fixed assets and provisions for risk (eg accrual of bad debts). | EBITDA - depreciations and provisions | Operating profit |
| 6 | Remaining amount after deduction of operating expenses to value added. It is a key indicator of profitability and business performance as it is independent of the financial policy of the | Value added - tax - wages and salaries - payroll taxes | Operating profit before depreciation and amortization (EBITDA) |

| | | | |
|---|---|---|---|
| | company. EBITDA should maintain and develop the means of production and pay the capital invested. | | |
| 7 | Represents the creation of value that the company provides to goods and services purchased from third parties. The value added must be sufficiently high to absorb all other expenses of the company. | Trade margin + Production - purchases of raw material - other purchases and external charges | Value added |
| 8 | Relevant indicator to determine the gross margin of an activity of reselling such distribution or trading. | Sales of goods - purchases of goods + Goods inventory change | Trade margin |

**Table 18.4 : Factors contributing to the Net results (Profit or Loss)**

**The most important is to determine what are the main part in the P&L contributing to the net income (positive or negative) and to understand what is the size of the company, what are its strengths and weakness, the evolution in its turnover and profitability...etc. These indicators allow to refine understanding of the business by zooming into some key points generating income or losses. A detailed analysis will also help to check if there are some manipulations in the financial statements**

### e) Cash flow analysis

The cash flow is a key indicator in many aspects. It is very important for shareholders because it is strongly linked to their earnings. It gives confidence to creditors about the company's ability to repay the debts and allows managers to invest in the development of their business. The cash flow represents the excess cash generated by the activity of the company during the year. It allows:

i. To repay loans,
ii. To pay shareholders,
iii. To invest,
iv. To strengthen the financial structure of the company.

### f) Balance Sheet Analysis

Analysis of the financial structure as a whole is a dynamic process. Each case is particular and the evaluation of the assessment depends intrinsically on the company business sector and of the financial need.

Assets, liabilities and ownership equity are listed as of a specific date, such as the end of its financial year. The balance sheet shows if company's activity is mainly financed by:

**Owner's Equity: capital stock, retained earnings, reserve,**

**Liabilities: accounts payable, loans payable, tax payable.**

The higher the part of **Owner's Equity** is high in comparison with debts, the more the company is financially autonomous, therefore solvent. In the opposite way, more debts part is high more the company depends on them to finance her/his activity, which can continue only if suppliers and banks credit lines are maintained and raised proportionately with company growth.

If we look to the company's financial resources (owners' equity + liabilities) and the assets, we can determine the part of the owner's equity which finances the current assets; in other words the business activity of the business. If working capital (**Working capital = Equity - Fixed assets)** is weak, working capital requirements is financed by the liabilities (negative treasury). The Working Capital (WC) must be positive and large enough to cover the Working capital requirement WCR.

If the Working Capital (WC) is negative, that means that equity is not sufficient to finance fixed assets and the company has recourse to the short-term bank loan (whose renewal is not guaranteed) to finance it.

**Working capital requirement: Operating assets (inventories + accounts receivables) - operating liabilities (payables).**

The Working Capital Requirement (WCR) represents the need to finance the operation. It depends strongly on the sector of activity. For example, industrial companies generally have a higher WCR while the major retailers have a negative working capital (they are paid by their customers before they pay their suppliers).

Companies having an unbalanced financial structure with an even negative WC and a high WCR is highly dangerous. This is a consequence of a bad management or a too light

financing. These situations make these companies very risky whatever is the good will of the leaders to respect their commitments.

**Net Cash**

Net cash is the difference between Working Capital – Working Capital Requirements. The Net cash is the remaining of WC after absorption of WCR. If the WC covers WCR, the net cash is positive. This amount is reflected in cash (excess cash on a bank account).

g) Credit notation

The credit notation is based on behavioural information, legal and financial information following are the methods of Credit notation

i. Payment behaviour,
ii. Age of the company,
iii. Legal form of the company,
iv. Age of the business relationship and evolution of orders,
v. Evolution of the turnover,
vi. EBIT and net income,
vii. Financial structure with the level of equity in relation to total assets,
viii. Indebtedness, working capital and cash ... etc.

A total of 15 criteria are used to build up this "credit score", each criteria has a defined weight in the final calculation. Following Four notes are possible:

A: Company olid,

B: Company stable,

C: Company fragile,

D: Company close to failure.

**Use the simplified credit rating with clients who refuse to disclose their balance sheet and income statement, which is common in several countries. In some countries (notably the Middle East) commercial culture is that these documents are confidential and are only internal management tools for managers. In this case, the solvency assessment will be based on others criteria like compliance and payment behaviour, which is of course reflected in the tool.**

# 18.6 CREDIT RATING INFORMATION SERVICES OF INDIA LIMITED (CRISIL)

Credit Rating Information Services of India Limited (CRISIL) is one such global analytical company that provides ratings, research, along with risk and policy advisory services. It is India's first credit rating agency, which has pioneered the concept of credit rating in the nation. It was launched in the country in 1987 with the Securities and Exchange Board of India ("SEBI"). With a tradition of independence, analytical rigour and innovation, CRISIL sets the standards in the credit rating business. CRISIL launched India's first index to benchmark performance of investments of foreign portfolio investors (FPI) in the fixed-income market, in the rupee as well as dollar version in 2018, which includes, mutual funds ranking, Unit Linked Insurance Plans (ULIP) rankings, CRISIL coalition index and so on. CRISIL went public in 1993, Headquartered in Mumbai, CRISIL ventured into infrastructure rating in 2016. CRISIL acquired 8.9% stake in CARE credit rating agency in 2017. CRISIL is registered in India as a credit rating agency.

The majority shareholder of CRISIL is Standard & Poor's, one of the biggest credit rating agencies of the world, expanded its business operation to USA, UK, Poland, Argentina, Hong Kong, China and Singapore apart from India.

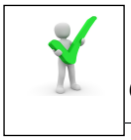
In India CRISIL rate the entire range of debt instruments, such as, bank loans, certificates of deposit, commercial paper, non-convertible / convertible / partially convertible bonds and debentures, perpetual bonds, bank hybrid capital instruments, asset-backed and mortgage backed securities, partial guarantees and other structured debt instruments, Mid-scale corporations and financial organisations. CRISIL has also instituted several innovations in India in the rating business, including rating municipal bonds, partially guaranteed instruments and microfinance institutions, also pioneered a globally unique rating service for Micro, Small and Medium Enterprises (MSMEs) and significantly extended the accessibility to rating services to a wider market.

### CRISIL Rating Criteria

CRISIL works towards managing and controlling credit and market risks at a portfolio level, and analyses the management's attitude towards risk and growth. Hence, CRISIL's ratings bridge the gap between the financier and the borrower or investors, enabling them to take the right decisions. These ratings act as an assurance that indicates the highest degree of safety for a fund. The ratings are made, based on information gathering, analysis and meetings with the Management.

CRISIL assigns credit ratings under the following six categories:

1) Long-term: Long-term ratings are assigned on a 20-point scale, from 'CRISIL AAA' to 'CRISIL D. The term 'long-term instruments' includes bonds, debentures, other debt securities, bank loans and other fund-based facilities with an original maturity of more than one year.'
2) Short-term: Short-term ratings are assigned on a 9-point scale, from 'CRISIL A1' to 'CRISIL A4' and 'CRISIL D' denoting default. The term 'short-term instruments' refers to commercial paper, short-term debentures, certificates of deposit, inter-corporate deposits, working capital borrowings, and other fund-based and non-fund based facilities with an original maturity of one year or less.
3) Dual Ratings: CRISIL assigns dual ratings (i.e., ratings on both long-term and short-term scale) to debt instruments that have an original maturity of more than one year, and also have a put option exercisable within one year from the date of issue. The first component of the rating, i.e., the long-term rating, addresses the likelihood of timely payment of principal and interest over the life of the instrument.
4) Structured finance ratings: The structured finance rating categories range from 'CRISIL AAA (SO)' to 'CRISIL D (SO)' on the long-term scale and 'CRISIL A1 (SO)' to 'CRISIL D (SO)' on the short-term rating scale. CRISIL assigns ratings to long-term and short-term structured finance instruments by using a suffix 'SO'. Instruments with an original maturity of more than one year are rated on long term scale whereas instruments with an original maturity of one year or less are rated on short term scale. Fixed Deposit (FD): CRISIL assigns ratings to the FD programmes of corporates, banks and financial institutions with the prefix, 'F'. FD ratings are assigned on a 14-point scale, from 'FAAA' to 'FD'
5) Financial strength ratings: CRISIL assigns financial strength ratings to insurance companies on a scale ranging from 'AAA' to 'D'.
6) Corporate credit ratings: CRISIL assigns corporate credit ratings to issuers on a scale ranging from 'CCR AAA' to 'CCR D' and 'CCR SD' (indicating selective default)



***Check Your Progress-A***

**Fill in the Blanks**

1. Debt owed to the firm by customer arising from sale of goods or services in the ordinary course of business is known as_____
2. _____Involvement is one of the characteristic features of the Receivables.
3. _____ represents a percentage of reduction in sales or purchase price allowed for early payment of invoices.
4. Credit evaluation process involved three steps Viz, _____,_____&_____
5. Receivable constitute a significant potential of _____
6. Optimum credit policy occurs where there is tradeoff between _____&_____

# 18.7 CREDIT SCORE FACTORS AND CREDIT SCORE

**Credit Score Factors**

There are three major credit reporting agencies in India, Credit Rating Information Services of India Limited (CRISIL), Credit Analysis and Research limited (CARE), Investment Information and Credit Rating Agency of India Limited. (ICRA) which report, update and store consumers' credit histories. While there can be differences in the information collected by the three credit bureaus, there are five main factors evaluated when calculating a credit score:

a) Payment history
b) Total amount owed
c) Length of credit history
d) Types of credit
e) New credit

**Validity of ratings**

CRISIL's ratings are under continuous surveillance over the life of the rated facility. In principle, all ratings assigned by CRISIL address the credit risk associated with the rated facility till such time as the entire facility is redeemed in full. Ratings are subject to change at any point in time, based on changes in the business profile or financial profile of the issuer, or the prospects for the industry in which the issuer operates. Therefore, CRISIL does not mention a fixed validity date in its rating communications, including rating letters, rating rationales and credit rating reports.

**Credit Score**

The credit score model was created by the Fair Isaac Corporation, also known as FICO, and it is used by financial institutions. A credit score is a statistical number that evaluates a consumer's creditworthiness based on credit history. Lenders use credit scores to evaluate the probability that an individual will repay his or her debts. A person's credit score ranges from 300 to 850 and the higher the score, the more financially trustworthy a person is considered to be. While every creditor defines its own ranges for credit scores (for instance, many lenders think anything over 800 is excellent), here is the average FICO score range:

a) Excellent: 800 to 850

b) Very Good: 740 to 799

c) Good: 670 to 739

d) Fair: 580 to 669

e) Poor: 300 to 579

## 18.8 SUMMARY

Receivable occupy an important position in the structure of current assets in financial statements of the organisation, which shows the rapid growth of credit sales approved by the firm for their customers. Objective of the receivable management are: Boost up sales volume, Monitor and Improve Cash Flow, To Minimises bad debt losses, Avoids invoice disputes, Improve customer satisfaction. Receivable management involves decision areas Credit standards, Credit period, and cash discount and collection procedure. A firm should follow an optimum credit policy that lies between lenient and stringent credit policy.

## 18.9 GLOSSARY

**Day's sales outstanding(DSO):** Average Collection period.

**Credit standard:** The minimum criteria for the extension of credit to a customer.

**Collection cost:** The Cost that are involved in collecting the debts from the customer.

## 18.10 ANSWERS TO CHECK YOUR PROGRESS

**Check your Progress-A**

1. Bills Receivable
2. Risk
3. Cash Discount
4. Obtaining Credit information, Analyzing the information and making the credit decision.
5. Current Assets
6. Liquidity and Profitability.

## 18.11 REFERENCES

Online sources:

- "Understanding CRISIL's Ratings and Rating Scales" Report Published by CRISIL 2018.
- https://www.crisil.com/en/home/our-businesses/ratings/understanding-rating.html
- https://www.sebi.gov.in/legal/circulars/nov-2019/enhanced-governance-norms-for-credit-rating-agencies-cras-_44862.html.

Offline sources

Book on Financial Management Principle and practice by G Sudarsana Reddy.

## 18.12 SUGGESTED READINGS

1. Financial Management: G Sudarsana Reddy .
2. Basic Financial Management: M.Y. Khan and P.K. Jain, 2000.
3. Financial Management: I.M. Pandey.
4. Financial Management: Theory and Practices- Prasanna Chandra.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997

## 18.13 TERMINAL QUESTIONS

Q1. What is credit policy? Discuss the different types of Credit policy.

Q2.Explain the importance of Receivable Management

Q3. Explain the Credit score factors and Credit scoring.

Q4. What is Receivable management? Discuss in detail the objective, benefits and Cost of Receivable management.

Q5. What is the role of credit policy variables in the credit policy of a firm? Discuss

Q6. Briefly explain the techniques available for Receivable Management.

Q7. What is Credit evaluation? Discuss the steps involved in it.

Q8. What is CRISL

**Practical Applications**

Q1. Identify the credit policy of a company of your choice from any sector.

Q2. Evaluate the performance of Receivable management of any company by collecting 5 years financial statements.

Q3. Take a company/ Bank/NBFC of your choice and find the procedure for evaluating individual accounts.

# Block V
# Dividend Decisions

# UNIT 19 DIVIDEND POLICY-AN INTRODUCTION



## 19.1 INTRODUCTION

Dividend policy represents the blueprint as per which company declares dividend to its shareholders. There are many views related to dividend declaration and stakeholder perceptions, and some theories propounds the importance of dividend on market price of shares whereas, some suggest that dividend have no relevance on shares as investors can sell their shares when they need cash. This unit tries to cover the various theories and tries to make them easily understandable for the students.

## 19.2 OBJECTIVES

After reading this unit, you would be able to;

- understand the different forms of dividend policy
- understand the relevance of dividend policy
- understand the factors influencing dividend decision making.

## 19.3 DIVIDEND POLICY

As per Weston and Bringham, "Dividend Policy determine the division of earnings between payments to shareholders and retained earnings"

In other words, Dividends are the payments received by the investors from time to time. Dividends are important as they tend to be the income of the shareholders and shareholder

too expects certain return from their investments in the form of dividends. Dividend policy is an important decision as they tend to show the guidelines according to which dividend are paid by the companies to their shareholders.

Dividend decision of companies depends upon company's earnings and also on their long term investment project. Dividend decision is also important because its effect the rating of the firm, growth rate and also the value of share price. There are two group of concepts regarding dividend policy and their impact on share value these are irrelevant and relevant concept. Irrelevant concept says that share prices are not affected by dividend policy whereas relevance concept says that share price is affected by dividend policy. These concepts will be discussed later in this module

Dividend Policy depends on three things:

- To retain earning for investments
- To distribute earning to shareholders in terms of dividends
- To have some corpus as retained earnings and distribution of wealth to share holders

## 19.3.1 DIMENSIONS OF DIVIDEND POLICY

This section covers the parameters on which dividend payout ratio depends:

Some of the dimensions are:

1) Fund requirement: This covers the total requirements of fund by the company of the organization.
2) Liquidity: This denotes the ready cash available by the company so to meet the future or immediate needs
3) External Financing: This dimension covers the external sources like bank loans etc.
4) Shareholder choice: This covers the shareholder preference whether they need dividend or further investments
5) Difference in the cost of retained income and external financial sources: If external financing is cheaper than dividend distribution is preferred or else company will retain the earning or further investments.
6) Control: This denotes the control of management or the shareholders.
7) Taxes structure also impact the dividend distribution decision.

## 19.3.2 TYPES OF DIVIDEND POLICY

1) Periodical return Policy: When it is paid at par rate then it is called regular dividend or periodical dividend. It is generally preferred by pensioners and old age people as it is a stable source of income. It is generally issued by the company which have a stable long term earnings.
   - It helps in maintaining a stable good will of the company
   - It promotes a fair value of share price

- It also builds confidence among the shareholders

However, regular dividend rate is generally less than the earning of the company.

2) Stable dividend: It means when regular dividend is paid and there is consistency in dividend payment. This type of Dividend falls into three category:

   - When dividend is fixed in respective of per share.
   - When there is constant payout ratio, this ratio fluctuates in respective of earnings.
   - Stable dividend plus extra depend upon profit.

There are also few other approaches related to dividend policy:

1) Residual Dividend policy: This policy entails dividend payment after all sort of investment are done i.e. the leftover profit is distributed as dividend after taking out capital for all sort of long term investments.
   The long term advance of this approach is it helps in long term planning and disadvantage is that it hinders in stable dividend payment.

   Steps in Residual Dividend Policy:
   - To determine the payout ratio considering optimum capital budget.
   - Determination of Equity needed for optimum capital budget
   - Distribution of dividend from the left over after doing retained earnings.

   This policy is beneficial for long term planning and investment as dividends are paid from left over but the disadvantage is dividend is not stable it keep on changing as per the need of the investment.

2) Dividend Stable policy: This policy is opposite to residual policy as this promotes stable dividend of yearly earnings. This policy reduces the uncertainty of dividend

3) Hybrid Approach: This framework is is a result of Residual and stable dividend framework. Under this methodology, companies overviews debt/equity ratio in longer aspect.

**Examples of Approaches:**

Regular Dividend, Say Company pays Rs 10 as dividend on per share than under this policy company will always pay Rs 10 as dividend per share.

Constant payout ratio says that as a company has a policy of paying 10 percent of its earnings as dividends. Than under this policy irrespective of earnings dividend will be 10percent of their earnings.

In stable and extra profit policy: Some portion of dividend is fixed thus promotes regular earnings and in times of extra profit, extra dividend is added to their regular dividend as a part of profit.

Example of Residual dividend policy, let's assume that there exist a company named XYZ which has right nowgeneratedRs1,000 and has a rigid rule to manage a debt/equity ratio of 0.5 (one part debt to every two parts of equity). Assuming that this company is having a project in which Rs 900 as capital is required. In its approach to manage the debt/equity ratio of 0.5, XYZ would have to outlay for one-third of this project by using debt (Rs 300) and two-thirds (Rs 600) by using equity. It means ,XYZ would have to raise Rs 300 from market and use Rs 600 of its own equity to manage the 0.5 ratio, leaving a residual amount of Rs 400 (Rs 1,000 –Rs 600) for dividends. This approach of dividend outlay initiatesfluctuations the dividend outlay that some investors may render it unsuitable.

Stable Dividend Policy Example says that a company earns Rs 2000 yearly and company policy says that company will distribute 25% as dividend than will be Rs 500 out of total earnings.

Hybrid policy example: This policy is a combination of other two policy say company has a policy of distributing 15 % as profit in the form of dividend if the earning is within Rs 3000 per year and if earning exceed Rs 3000 than the shareholder will also get extra dividend apart from usual 15% of profit.

So these are some of the example related to the dividend policy. Dividend decision is important because it not only promotes confidence among shareholders but also help in future investment decisions.

# 19.4 ACTIVE VS PASSIVE DIVIDEND POLICY

Passive and active dividend policy depends upon the time of distribution of dividend. Active dividend policy is more concern with regular dividend payments whereas passive dividend policy is concern with the payment of dividend when the right time comes or when the management thinks it’s time to distribute dividends.

## Theories of Dividend

There are generally two major streams of Dividend: One is Relevance and other is irrelevance theories which study the significance of Dividend decision and their impact on the value of firm. Both the theories share contrary views on dividend and market worth of the company.

## 19.4.1 RELEVANCE THEORY

Prof. James E.Walter and Prof. Gordon supported the theory that value of the firm is affected by the dividend policy and they play a concrete role in affecting the share price of the company. They have studied the importance of the transactional value between internal rate of return (R) and cost of capital (K) in deciding acceptable dividend policy which enhances the wealth of stakeholders.

### 19.4.1.1 Walter Model valuation of Shares:

Various assumptions of this Model are;

1) Company initiates its investments by utilizing its retained portion of income.

2) The Internal Rate Of return (R) and Cost of Capital (K) of the company is stable.

3) The company revenue are either disbursed as dividends or taken for internal use.

4) The income and dividends of the company is constant.

5) The firm is having perpetual succession.

$P= (DPS/k) + [r (EPS-DPS)/K] K$

Or

$P= [D+r/k * (E-D)]/K$

DPS= Dividend per share

EPS= Earnings per share

P=Market price per share

R= firms rate of return

K= firms cost of capital

**Evaluation through example:**

A company has the following facts:
Cost of capital (ke) = 0.10
Earnings per share (E) = Rs 10
Rate of return on investments ( r) = 8%
Dividend payout ratio: Case A: 50% Case B: 25%
Show the effect of the dividend policy on the market price of the shares.

Case A:

D/P ratio = 50%
When EPS = Rs 10 and D/P ratio is 50%, D = 10 x 50% = Rs 5

$$P = \frac{5 + [0.08 / 0.10] [10 - 5]}{0.10} \Rightarrow \text{Rs } 90$$

Case B:

D/P ratio = 25%
When EPS = Rs 10 and D/P ratio is 25%, D = 10 x 25% = Rs 2.5

$$P = \frac{2.5 + [0.08 / 0.10] [10 - 2.5]}{0.10} \Rightarrow \text{Rs } 85$$

**Criticism:**

- Model assumed that firm investments are totally done through corpus of retained portion of income and not depends upon external borrowing.
- Model assumes that constant r and constant cost of capital are false as r and cost of capital changes with time. Walter Model deduces risk from the value of firm by considering discount rate to be constant.

### 1.9.4.1.2 Gordon Model Valuation of shares

**Gordon Model Assumptions:**

1) The company is debt free i.e. only equity ownership.
2) Company is depended totally on the retained portion of income for future investments.
3) The company's IRR is constantly stable.
4) The cost of capital of the company is stable without any fluctuations..
5) The company have its earnings in succession i.e. never ending.
6) Growth ratio and retention ratio is also constant.
7) K>g.
8) Lack of corporate tax

Formula to calculate Market price of shares: $P = (EPS * (1-b) / (k-g)$

P = Market price per share

EPS = Earnings per share

b= retention ratio of the company

(1-b) = payout ratio of the company

k = cost of capital of the company

g = growth rate of the firm = b*r

Valuation with help of example:

Earnings per share of company T is Rs 30. The rate of market discount is 24% .The dividends are assumed to grow 20% annually. Retain earnings of company is 60%.Calculate market value of shares as per Gordon model.

P= [30*(1-.60)]/ (.24-.20) = Rs 300

**Criticism:**

- No external financing assumption is unclear and unrealistic
- Constant rate of return and constant cost of capital is vague assumptions as it supposes that shareholder wealth is not tuned. A stable k means the associated business risks are not calculating for valuation of the companies.

Both the model shares common views as they have almost common objectives.

### 1.9.4.1.3 Traditional Model

This was propounded by B Graham and DL Dodd, they showed a clear existence of relation between dividend and stock market, they argued that high dividend affect the market price of shares positively and vice versa. They have introduced the concept of multiplier for establishing a relationship between market price and dividend.

They argued that price to earnings ratio(P/E ratio) related to dividend payout ratio: a greater dividend payout ratio will enhance the P/E ratio and will be reciprocated.

Formula for valuation:

P= m (D+E/3)

P= Price

M= Multiplier

D=Dividend per share

E=Earnings per share

**Criticism:**

- Relationship of P/E ratio and dividend payout ratio is not true for firm which have high earning and low payout ratio.

- Approach not applicable for firm with slow growth rate and high payout ratio
- There are investors who prefer dividend instead of unexpected capital gains and vice versa so the approach is not exactly applicable for all the firms.

## 19.4.2 IRRELEVANCE THEORY

Modigliani-Miller Model supports the irrelevance theory of dividend decision making which says that the investments and earning of the firms are the critical factors in deciding the dividend decision making.

This theory was proposed by Franco Modigliani and Merton Miller in 1960, they focused that the most important things for investors is company investment policy and their future earning if investment and earning is good than investors does not requires the dividend history for the valuation of share price.It means the future investments are driven by company policy on investment not on dividend policy. They further iterated that investors can handle their cash need from the stock itself and they don't need dividend for meeting their cash requirements.

Valuation of shares price as per MM approach:

The assumed the same discount rate/ rate of return for all stocks:

Formula for calculating the shares price: t1= t0*(1+y)-D

$t_1$ = market price of the share at the end of a period

$t_0$ = market price of the share at the beginning of a period

y = capital's cost

D = the amount of dividend received

**Explanation through Example:**

Price of Reliance stock was Rs 1500. The discount rate applicable by the company is 15%. Reliance declares dividend of Rs 100 per share. Calculate the price of Reliance shares as per MM Approach.

Market price of the stock = P1 = 1500 * (1 + .15) – 100 = 1500 *1.15 – 100 = 1625.

**Assumptions:**

1) Capital markets are of perfect in nature: - Free flow of information having no transactional cost causes rational decision making.
2) There exist no taxes: - Existence of liberal tax regime for capital gains and dividends.
3) The firm has a rigid investment structured with strong policy .So if the retained portion of income is again used, there is no change in the risk pattern of the company. So y remains constant.

4) There is no existence of floatation cost.

**Criticism:**

- There assumptions of no taxes in capital market cannot be justified as in reality there are taxes in capital market.
- Assumption that no difference in external and internal financing is not correct as there are certain costs which make both the financing different.
- Cash from shares selling as cash from dividend is different as selling cost are also include in share which make dividend more preferable.
- In some cases dividend is relevant for the investors.

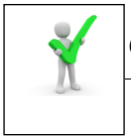
So these are the basic approaches which differentiate between the share price and dividend decision relationship.

## 19.4.3 LINTNER'S MODEL

John Lintner's studied the actual dividend behaviour in the year 1956. The study concluded that investment needs are not so important for dividend decisions rather dividend distribution change affect the earnings of company. This study was done in two phase using interview method for data collection.

## 19.4.4 RADICAL APPROACH

This approach focussed on tax on earnings and dividend and concluded that if tax on dividend is greater than in that case dividend distribution is not preferred rather than capital gain is good and vice versa.



***Check Your Progress-A***

**Q1. Why dividend policy decisions are important for a company?**

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**Q2. What is the difference between Passive and Active Dividend Policy?**

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**Q3. What are the assumptions of Walter's dividend model?**

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**Q4.What is Lintner's Model?**

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# 19.5 DIVIDEND DECISION FACTORS

Dividends are the part of cash shared with shareholders. Dividend distribution depends upon host of factors some of them are mentioned below:

1) Legal requirement: Although there are no legal requirement for dividend distribution subject to certain requirements. If there is profit company is required to pay dividend and if company suffers loss than dividend distribution is not compulsory. Firms are not required to pay dividend of this paid in capital to protect the equity base lastly, if the company is insolvent than it is not required to pay dividend.
2) Firm's liquidity position: Liquidity position denotes cash availability of a firm, if a firm has high liquidity it's easier to distribute cash as dividend.
3) Repayment Debt: If the firm has high repayment obligations than dividend payment will be difficult whereas if the firm has no obligations than dividend payment in cash will be easier.
4) High rate of return: If the firm expect high earnings in future than company will distribute fewer dividends and will retain more for further investments.
5) Stability of Earnings: Stable earnings promote regular dividend for the shareholders.
6) Desire of control: If the firm wants to retain power they will issue less stock to prevent dilution of power and to finance the project they will retain their earnings rather than distributing them as profit.

7) Access to capital market: If firm have easy sources of raising fund than they will distribute dividend easily as compared to the firm which have less ease of getting funding.

8) Tax Situation: To prevent dividend taxations sometimes shareholders prefer not to receive cash dividends.

## 19.6 SUMMARY

Dividend is important as it builds confidence among the shareholders and as per relevance theory it also affects the market price of shares but contrary to this, it also affects the retained earnings of the company as profit of company is used in the distribution of dividend and thus future investments are hampered.

Irrelevance theory propagates that shares are not affected by the dividend company pay. So keeping all this objectives a firm makes investment payout decision.

## 19.7 GLOSSARY

**Dividends:** Dividends are the payments received by the investors from time to time.

**Liquidity:** This denotes the ready cash available by the company so to meet the future or immediate needs.

**Stable dividend**: It means when regular dividend is paid and there is consistency in dividend payment.

## 19.8 REFERENCES


- Pandey I M-Financial Management (Vikas, 2004, 10th Ed.)
- Van Horne-Financial Management and Policy (Prentice hall, 2003, 12th Ed.)

## 19.9 SUGGESTED READINGS

1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.

## 19.10 TERMINAL QUESTIONS

Q1. Enumerate the important parameters relevant to dividend decision making.

Q2. Differentiate between relevance and irrelevance theory.

Q3. Discuss the dividend policy and the various types of dividend policy.

Q4. The following information relates to BSNL Ltd.:

Earnings of the Company Rs 6, 00,000

Dividend payout Ratio 20%

No. of shares outstanding 2, 00,000

Rate of return on investment 8.5%

Equity capitalization rate 7%

Calculate:

a. Market Value Per Share by using Walter Model.

b. What is optimum dividend payout ratio?

c. What is market value of Company's share to payout ratio?

Q5. How far do you agree that dividends are irrelevant?

# UNIT 20 DIVIDEND- ISSUES AND TYPES



## 20.1 INTRODUCTION

Every individual tries to generate income from their investments, some investments are less risky and some are risky, consequently there are different investments avenues matching investor's needs, one of the most preferred investment avenues is share market and the earning investor gets from investing in share market is called Dividend. Dividend declaration is a cumbersome task for the company and due consideration is required before paying dividend. This unit cover the area of dividend issuances, types and legal consideration of dividends to make students aware of different technicalities attached with dividend declaration.

## 20.2 OBJECTIVES

After reading this unit, you would be able to;

- understand the concept of dividend.
- understand the types of dividend.
- identify different features of dividend declaration .
- highlight the Legal consideration attached.

## 20.3 DIVIDEND: ISSUES AND TYPES

According to Institute of Chartered Accountant of India, "A dividend is a distribution to shareholders out of profit or reserve available for this purpose"

In other words Dividend is a portion of income which is given by the company to its shareholders. It is a part of profit distributed by the firms to the stakeholders. Dividend is important because it helps in building confidence among the shareholders and as per relevance theories it also helps the market value of shares. Dividend can be given in the form of cash, shares or other means.

Company has to deal with the problem of deciding that what portion of their income they will distribute as dividend and what portion they will keep for further investments. It is a crucial decision for any firm that what they should retain and what they should distribute as retain earning helps in further investment options.

Dividend is generally decided on the basis of earning per share and sometime it is also given as percentage of earnings and in that case it is called dividend yield.

## 20.4 DIVIDEND PAYOUT POLICIES

A company that issues dividends may choose the amount to pay out using a number of methods.

- Stable dividend policy: Even if corporate earnings are in flux, stable dividend policy focuses on maintaining a steady dividend payout.
- Target payout ratio: A stable dividend policy could target a long-run dividend-to-earnings ratio. The goal is to pay a stated percentage of earnings, but the share payout is given in a nominal dollar amount that adjusts to its target at the earnings baseline changes.

- Constant payout ratio: A company pays out a specific percentage of its earnings each year as dividends, and the amount of those dividends therefore vary directly with earnings.
- Residual dividend model: Dividends are based on earnings less funds the firm retains to finance the equity portion of its capital budget and any residual profits are then paid out to shareholders.

## 20.5 IMPLICATIONS OF DIVIDEND

Price implication : When dividend is declared it affect the share price generally share price see a downfall as amount of profit of company is reduced in paying dividend thus reducing market capitalization of company and it finally affect the share price.

Companies Implication: When dividend is declared it affect the retained earning thus further investment gets affected because of investment decision.

Investor's implications: Receiving dividend although beneficial for the investors but it also affect the investors in the form of tax liability attached.

So dividend decision is very crucial for a company and taking this decision after studying all the pros and cons is very important for a firm.

## 20.6 TYPES OF DIVIDEND

**There are three categories of dividend:**

On the basis of shares:

a) Preference share dividend

b) Equity share dividend

On the basis of Payment:

a) Cash Dividend

b) Stock Dividend

c) Bond Dividend

d) Property Dividend

e) Composite Dividend

On the basis of time of payments

a) Interim

b) Regular

c) Special

**Classification of Each:**

- Preference share dividend: These shareholders have the preferential right to receive dividend and commonly the dividend is also fixed.
- Equity Shareholders are the shareholder who receive dividend after the payment of preference shareholders.
- Cash Dividend: This is the most preferred way of paying dividend. Under this dividend is paid in the form of cheque to the shareholders or to the brokerage firms.

  For example: Example:

  ABC pays an Rs .10 dividend to shareholders. An investor who owns 1,000 shares of ABC will receive $100:

  1,000 shares x Rs .10 = Rs 100.

- Stock Dividend: Sometime the firm want to keep cash for business need and the firm also want to reward its shareholders so in that case they give stock instead of cash to existing shareholders on the basis of their previous shareholdings. When stock dividend is given it reduces the share price of company as new shares are issued but the market capitalization remains the same.

  Example:

  If ABC pays a 10% stock dividend to its shareholders, an investor with 500 shares will receive an additional 50 shares. This is determined by multiplying the number of shares owned by the amount of the dividend to be paid.

  500 x 10% = 50

- Product /Property:

This is the least common way of giving dividend. As per this method dividend is paid in the form of property or product of the company.

- Right/ scrip dividend:

Under this way shareholders are given the rights to buy the share before any new purchasers. All common stockholders have a pre-emptive right to maintain the proportional ownership in the company. The shareholders are given the offer to buy the shares at a lower price than the market price under this scheme. 45 days time period is given to buy the shares.

- Interim dividend:

These are the dividends which are declared even before the annual general meeting and making of financial statement.

- Regular dividend:

These are the dividends which are pain regularly and in fixed amount over the years.

- Special Dividend:

A special dividend is a non-recurring distribution of company assets, usually in the form of cash, to shareholders. A special dividend is larger compared to normal dividends paid out by the company. Also referred to as an "extra dividend".

So these are some of the form of dividend paid by the companies to the shareholders.

## 20.7 DIVIDEND STABILITY

Stable or regular dividend means when dividend is paid at frequent intervals. The decision to distribute dividend depends on a trade off between future earnings and investments. A firm has to decide what portion they should retain and what portion they distribute as dividend.

Some companies pay constant dividend in amount form, some pay constant dividend in percentage form, some pay small constant dividend plus extra as bonus. Stable dividend policy although create positive attitude among the shareholders, plus reduces the uncertainty and also assist in earning current income rather than future income.

Stable dividend policy has certain limitations like it create unnecessary pressure on the firm, it affect the retained earnings also to an extent.

## 20.8 STOCK DIVIDEND

At times the company faces the shortage of cash or the company wants to store cash for further investments so in that case the company uses stock in the form of dividend. In other words when company pays shares to shareholders in the form of dividends than it is called stock dividend.

These distributions are generally acknowledged in the form of fractions paid per existing share, such as if a company issued a stock dividend of 0.05 shares for each single share held by existing shareholders.

The board of a public company, for example, can approve a 5% stock dividend, which gives existing investors an additional share of company stock for every 20 shares they already own. However, this means that the pool of available equities increases by 5%, diluting the value of existing shares. So, even though an investor who owns 100 shares in a company may receive 5 additional shares, the total market value of those shares remains the same. In this way a stock dividend is very similar to a stock split.

## 20.9 STOCK SPLITS

It is a process where a company divides its existing shares into multiple numbers of shares. In this method numbers of share increases whereas the market capitalization remains the same**.** The most common split ratios are 2-for-1 or 3-for-1, which means that the stockholder will have two or three shares for every share held earlier.

For example:

If a company has 100 shares outstanding with the value of Rs 1000 per share in this case the market capitalization is 100x Rs 1000=Rs 100000.

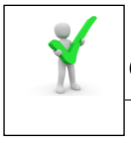
Now if the company takes the decision of splitting 2 for 1 share than in this case the number of shares become 200 whereas the value per share remains Rs 500 whereas the market capitalization remains the same i.e. 200 x Rs 500= Rs 10000

**Benefits of Stock Splits:**

First, a split is usually undertaken when the stock price is quite high, making it pricey for investors to acquire a standard board lot of 100 shares

Second, the higher number of shares outstanding can result in greater liquidity for the stock, which facilitates trading and may narrow the bid-ask spread.

While a split in theory should have no effect on a stock's price, it often results in renewed investor interest, which can have a positive impact on the stock price. While this effect can be temporary, the fact remains that stock splits by blue chip companies are a great way for the average investor to accumulate an increasing number of shares in these companies.



***Check Your Progress-A***

**Q1. What are the various types of dividend?**

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**Q2. What do you mean by Dividend Payout Policy?**

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**Q3. What do you mean by Stock Splits?**

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## 20.10 LEGAL CONSIDERATION OF PAYING DIVIDENDS

Some of the most important determinants of dividend policy are: (i) Type of Industry (ii) Age of Corporation (iii) Extent of share distribution (iv) Need for additional Capital (v) Business Cycles (vi) Changes in Government Policies (vii) Trends of profits (vii) Trends of profits (viii) Taxation policy (ix) Future Requirements and (x) Cash Balance.

The declaration of dividends involves some legal as well as financial considerations. From the point of legal considerations, the basic rule is that dividend can only be paid out profits without the impairment of capital in any way. But the various financial considerations present a difficult situation to the management for coming to a decision regarding dividend distribution.

These considerations are discussed below:

(i) Type of Industry:

Industries that are characterised by stability of earnings may formulate a more consistent policy as to dividends than those having an uneven flow of income. For example, public utilities concerns are in a much better position to adopt a relatively fixed dividend rate than the industrial concerns.

(ii) Age of Corporation:

Newly established enterprises require most of their earning for plant improvement and expansion, while old companies which have attained a longer earning experience, can formulate clear cut dividend policies and may even be liberal in the distribution of dividends.

(iii) Extent of share distribution:

A closely held company is likely to get consent of the shareholders for the suspension of dividends or for following a conservative dividend policy. But a company with a large number of shareholders widely scattered would face a great difficulty in securing such assent. Reduction in dividends can be affected but not without the co-operation of shareholders.

(iv) Need for additional Capital:

The extent to which the profits are ploughed back into the business has got a considerable influence on the dividend policy. The income may be conserved for meeting the increased requirements of working capital or future expansion.

(v) Business Cycles:

During the boom, prudent corporate management creates good reserves for facing the crisis which follows the inflationary period. Higher rates of dividend are used as a tool for marketing the securities in an otherwise depressed market.

(vi) Changes in Government Policies:

Sometimes government limits the rate of dividend declared by companies in a particular industry or in all spheres of business activity. The Government put temporary restrictions on payment of dividends by companies in July 1974 by making amendment in the Indian Companies Act, 1956. The restrictions were removed in 1975.

(vii) Trends of profits:

The past trend of the company's profit should be thoroughly examined to find out the average earning position of the company. The average earnings should be subjected to the trends of general economic conditions. If depression is approaching, only a conservative dividend policy can be regarded as prudent.

(viii) Taxation policy:

Corporate taxes affect dividends directly and indirectly— directly, in as much as they reduce the residual profits after tax available for shareholders and indirectly, as the distribution of dividends beyond a certain limit is itself subject to tax. At present, the amount of dividend declared is tax free in the hands of shareholders.

(ix) Future Requirements:

Accumulation of profits becomes necessary to provide against contingencies (or hazards) of the business, to finance future- expansion of the business and to modernise or replace equipments of the enterprise. The conflicting claims of dividends and accumulations should be equitably settled by the management.

(x) Cash Balance:

If the working capital of the company is small liberal policy of cash dividend cannot be adopted. Dividend has to take the form of bonus shares issued to the members in lieu of cash payment.

The regularity of dividend payment and the stability of its rate are the two main objectives aimed at by the corporate management. They are accepted as desirable for the corporation's credit standing and for the welfare of shareholders.

High earnings may be used to pay extra dividends but such dividend distributions should be designed as "Extra" and care should be taken to avoid the impression that the regular dividend is being increased.

A stable dividend policy should not be taken to mean an inflexible or rigid policy. On the other hand, it entails the payment of a fair rate of return, taking into account the normal growth of business and the gradual impact of external events.

A stable dividend record makes future financing easier. It not only enhances the credit-standing of the company but also stabilises market values of the securities outstanding. The confidence of shareholders in the corporate management is also strengthened.

**Legal rules governing payment of dividends:**

It is illegal to pay a dividend, if after its payment; the capital would be impaired (reduced). This requirement might be met if only capital surplus existed. An upward revaluation of assets, however, would create a capital surplus, but at the same time might operate as a fraud on creditors and for that reason is illegal.

Basically the dividend laws were intended to protect creditors and therefore prohibit payment of a dividend if a corporation is insolvent or if the dividend payment will cause insolvency.

The corporate laws must be taken into consideration by the directors before they declare a dividend. The company can postpone the distribution of dividend in cash, which may be conserved for strengthening the financial condition of the company by declaring stock dividend or bonus shares.

To sum up, the decision with regard to dividend policy rests on the judgement of the management, since it is not a contractual obligation like interest. The formulation of dividend policy requires a balanced financial judgment by judiciously weighting the different factors affecting the policy.

**Stock dividend or bonus shares:**

A stock dividend is a distribution of additional shares of stock to existing shareholders on a pro-rata basis i.e. so much stock for each share of stock held. Thus, a 10% stock dividend would give a holder of ICQ shares, as additional 10 shares, whereas a 250% stock dividend would give him 250 additional shares. A stock dividend has no immediate effect upon assets.

It results in a transfer of an amount from the accumulated earnings or surplus account to the share capital account. In other words, the reserves are capitalised and their ownership is formally transferred to the shareholders.

The equity of the shareholders in the corporation increases. Stock dividends do not alter the cash position of the company. They serve to commit the retained earnings to the business as a part of its fixed capitalisation.

**Reasons for declaring a stock dividend:**

Two principal reasons which usually actuate the directors to declare a stock dividend are:

(1) They consider it advisable to reduce the market value of the stock and thereby facilitate a broader distribution of ownership.

(2) The corporation may have earnings but may find it inadvisable to pay cash dividends.

The declaration of a stock dividend will give the stock holders evidence of the increase in their investment without interfering with the company's cash position. If the stock holders prefer cash to additional stock in the company, they can sell the stock received as dividend.

Sometimes, a stock dividend is declared to protect the interests of old stock holders when a company is about to sell a new issue of stock (so that new shareholders should not share the accumulated surplus).

## 20.11 LIMITATIONS OF STOCK DIVIDENDS

The bonus shares entail an increase in the capitalisation of the corporation and this can only be justified by a proportionate increase in the earning capacity of the corporation. Young companies with uncertain earnings or companies with fluctuating income are likely to take great risk by distribution stock dividends.

Every stock dividend carries an implied promise that future cash dividends will be maintained at a steady level because of the permanent capitalisation of reserves. Unless the corporate management has reasonable grounds of entertaining this hope, the wisdom of large stock dividend is always subject to grave suspicion.

The existence of legal sanction for distributing the accumulated earnings or reserves does not warrant the issue of stock dividends from the point of view of sound financial practice. There should be other conditioning factors also for the issue of stock dividend.

(a) Bonus shares bring about a capitalisation of undistributed profits in the companies where the profits originate and this lead to a linear development of corporate enterprise and greater concentration of economic power.

(b) By issuing stock dividends-the corporations deprive the capital market of 'secondary' funds which would otherwise have flowed into more widely dispersed investments.

(c) Bonus shares enable companies to appropriate to their own use undistributed profits which, otherwise, would have led either to an increase in the share of labour or a reduction in prices for the consumer.

## 20.12 SUMMARY

In short this unit tries to make student understand that dividend is a sort of earning which is distributed to investors in the form of reward. Dividend can be given in the form of cash, dividend and cash plus dividend too. Dividend decision is important as it affects the retained

earnings of the company and if company is not distributing dividend it affect the investor confidence. Thus studying all parameters and then distributing dividend is advisable for the firms.

## 20.13 GLOSSARY

**Dividend:** Dividend is a portion of income which is given by the company to its shareholders. It is a part of profit distributed by the firms to the stakeholders.

**Target payout ratio:** A stable dividend policy could target a long-run dividend-to-earnings ratio.

**Cash Dividend:** This is the most preferred way of paying dividend. Under this dividend is paid in the form of cheque to the shareholders or to the brokerage firms.

**Stock Splits:** It is a process where a company divides its existing shares into multiple numbers of shares. In this method numbers of share increases whereas the market capitalization remains the same.

**Stock Dividend:** A stock dividend is a distribution of additional shares of stock to existing shareholders on a pro-rata basis i.e. so much stock for each share of stock held.

## 20.14 REFERENCES


- Smriti Chand, Article Library, .Http://www.yourarticlelibrary.com/financial-management/10-most-Important-determinants-of-dividend-policy-financial-management/26237
- Pandey I M-Financial Management (Vikas, 2004, 10th Ed.)
- Van Horne-Financial Management and Policy (Prentice hall, 2003, 12th Ed.)
- Shapiro-Multinational Financial Management (Wiley Dreamtech)
- Sheeba kapil-Fundamental of financial management (Pearson )
- Khan and Jain-Financial Management (Tata McGraw Hill, 3rdEd.)

- Prasanna Chandra-Fundamentals of Financial Management (TMH, 2004)
- Knott G-Financial Management (Palgrave, 2004)
- Lawrence J.Gitman–Principles of Managerial Finance (Pearson Education, 2004)
- R P Rustagi-Financial Management (Galgotia, 2000, 2nd revised ed.)


## 20.15 SUGGESTED READINGS


1. Smriti Chand, Article Library, .Http://www.yourarticlelibrary.com/financial-management/10-most-Important-determinants-of-dividend-policy-financial-management/26237
2. Pandey I M-Financial Management (Vikas, 2004, 10th Ed.)
3. Van Horne-Financial Management and Policy (Prentice hall, 2003, 12th Ed.)
4. Shapiro-Multinational Financial Management (Wiley Dreamtech)
5. Sheeba kapil-Fundamental of financial management (Pearson )
6. Khan and Jain-Financial Management (Tata McGraw Hill, 3rdEd.)
7. Prasanna Chandra-Fundamentals of Financial Management (TMH, 2004)
8. Knott G-Financial Management (Palgrave, 2004)
9. Lawrence J.Gitman–Principles of Managerial Finance (Pearson Education, 2004)
10. R P Rustagi-Financial Management (Galgotia, 2000, 2nd revised ed.)


## 20.16 TERMINAL QUESTIONS

Q1.What do you understand by dividend? State the different forms of dividend.

Q2. Differentiate between stock splits and cash dividend.

Q3. Critically evaluate the implications attached with dividends.

Q4. List out the different types of dividend in brief.

Q5. What to you understand by the term dividend?

# UNIT 21 DIVIDEND THEORIES



## 21.1 INTRODUCTION

Dividend theories show the relevance and irrelevance of dividend on the market value of shares. Theories tries to project that in what way dividend affect the shares market value and how share valuation is done using different approaches of dividend models. Various models are given by different researcher concerning dividend declaration and their affect on the market value of shares this unit tries to cover those theories and tries to project the relevance on market value of shares.

## 21.2 OBJECTIVES

After reading this unit, you shall be able to,

- Understanding the different models of dividend theories
- Understanding the valuation of shares by using different approaches
- Understanding how management deals with dividend decision making

# 21.3 DIVIDEND THEORIES

Dividend is a part of profit which is distributed by the company to the shareholders. Distribution of dividend is important as it increases the income of shareholders and it builds confidence in them consequently it also affect the market value of shares as well.

Company has to take the decision that what portion of their income has to be distributed as dividend and what portion they should retain for further investment.

Payment of dividends has to rationale:

- It reduces the income for further investments
- It increases the value of shares.

There are basically two approaches for dividend theories each having a different perspective and argument for dividend and market values of shares.

Relevance Theories:

a) Walter's Model

b) Gordon's Models

c) Traditional Model

Irrelevance Theories

a) Residual Theories

b) Miller and Modigliani Theory( MM Approach)

# 21.4THEORIES OF DIVIDEND POLICY: RELEVANCE THEORIES

Relevance theories suggest that dividend payment reflexes the market based values of shares. If a company will pay optimum dividend than it will positively affect the value of the firms. There are two theories which support relevance model of dividend payments.

## 21.4.1 WALTER'S MODEL

Prof. James. E. Walter postulated that corporate's dividend decision making have bearing on the worth of the company. Prof. Walter studies the bonding between cost of capital (K) and internal rate of return (I) in understanding the optimum dividend policy which enhances the worth of shareholders.

Walter's Model is based on certain assumptions:

1) Company initiates its investments by utilizing its retained portion of income.

2) The Internal Rate Of return (R) and Cost of Capital (K) of the company is stable.

3) The company revenue are either disbursed as dividends or taken for internal use.

4) The income and dividends of the company is constant.

5) The firm is having perpetual succession

Walter's has given the following formula:

t = market price per share.

D = dividend per share.

y = earnings per share.

i = internal rate of return.

o = cost of capital.

$$t = [D+i (y-D)/o]/o$$

Example: If the earning per share of a company is Rs 10 and dividend payout ratio is 40%. Internal rate of return is 15% and cost of capital is 10%. What will be the market per share?

Calculation:

Dividend is 40% of 10 that is Rs 4

So putting in formula

P= [4+.15(10-4)/.10]/.10= Rs 490

This theory stems on the comparative relationship between internal rate of return(i) and cost of Capital (0).

- If i>o than in that case it is better to retain the earning rather than distributing them to the shareholders. As retained earnings will be better for further investment than distributing them to the shareholders. In this case firm is called as growth firm

  Numerical Example:

  Growth firm:i>o

  If i=10%, o=8%, y =Rs 8

  If Dividend is Rs 4

  Calculation:

  = {[4+ .10(8-4)]/.08}/.08

  =Rs687.5

- If i=o than firm will be called as normal firm as retained earnings will have no influence on the share price. So in that case there will be no optimum payout.

  Normal firm: i=o

  If i=15%, o=15%, y= Rs 4 D=Rs 4

  = {[4+ .15(0)]/.15}/.15

  Rs177.77

- If R<K than firm can be termed as declining firm. Firm income from investment will be less than shareholder earnings. In that case it is advisable for the firm to distribute all the earnings to the shareholders.

  Declining firm: i<o

  If i =10%, o= 15%, y=Rs 8, D=Rs 6

  = {[6+ .10(2)]/.15}/.15

  Rs275.5

**Criticism**

Model assumed that firm investments are totally done through internal financing and no borrowing from outside is done which is unrealistic in nature.

Model assumes that of constant r and constant cost of capital are not genuine as r and cost of capital changes with time. Walters's model assumes that discount rate is constant and thus deduces risk from the total value of the company.

## 21.4.2 GORDON MODEL

Gordon model is also known as the growth model it tries to find the intrinsic value of a share assuming a constant growth in the dividend. The three variables taken for this model are dividend per share, growth rate and required rate of return. Assumption taken for this model is that dividend grows at a constant rate.

Assumptions of Gordon model are:

a) The company is completely debt free i.e. its equity based.

b) There exists no external borrowing.

c) The value of internal rate of return is fairly constant.

d) The company's capital's cost is constant.

e) The company's earnings are ever lasting.

f) The retention and growth ratio are also constant

g) There exists no corporate tax.

Gordon has given following formula

T = price / share

Ke = Capital'cost

U = earnings /share

b = retention ratio

(1-b) = payout ratio

g = br growth rate (r = internal rate of return)

Here the firm share price is calculated using the formula:

$T = E(1+b)/Ke-br$

As per Gordon, when i>o the price per share enhances as the dividend payout ratio decreases.

When i<o the price per share is increased as the dividend payout ratio also sees increment When i=o the price per share remains unchanged in response to the change in the payout ratio.

1) The practical or optimum pay-out ratio for a growing company (i>o) is 0.

2) There exist no practical or optimum ratio for a normal company (i=o).

3) There exist optimal pay-out ratio for a struggling company (i<o) is 100%.

It is clearly that both Gordon and Walter share similar views on dividend policy.

**Criticism of Gordon models:**

Constant Growth rate is a rare phenomenon for any firm due to various reasons like business cycle etc so assuming constant growth rate is itself a limitation of this model.

Later on Gordon revised his model by taking the factors of risk and uncertainty, he said even when i=o the dividend policy complexes the worth of shares because people give more consideration to current dividend than future dividend as future is full of uncertainty and risk.

He took the concept of Bird in hand arguments means investor likes instant dividend more in comparison to differed dividend thus even if i=o dividend payout can affect the value of shares because of uncertainty and risk factors, and these are the two assumptions for this argument.

## 21.4.3 TRADITIONAL MODEL

This model is given by B Graham and DL Dodd, they showed a clear relationship between dividend and stock market, they argued that high dividend affect the market price of shares positively and vice versa. They have introduced the concept of multiplier for establishing a relationship between market price and dividend.

They argued that price to earnings ratio(P/E ratio) related to dividend payout ratio: greater dividend payout ratio will enhance the P/E ratio and vice versa.

Formula for valuation:

A= h (n+f/3)

A= Price

h= Multiplier

n=Dividend per share

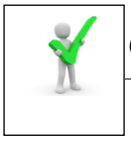
f=Earnings per share

**Criticism:**

Relationship of A/f ratio and dividend payout ratio is not true for firm which have high earning and low payout ratio.

Approach not applicable for firm with slow growth rate and high payout ratio.

There are investors who prefer dividend instead of unexpected capital gains and vice versa so the approach is not exactly applicable for all the firms.



***Check Your Progress-A***

**Q1. List Relevance theories of dividend policy.**

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**Q2. What are essentials of Walter's Model?**

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**Q3. Discuss criticism of Gordon model.**

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# 21.5 IRRELEVANCE THEORY

Irrelevance theory says that dividend decision does not affect the wealth of shareholders and thus it does not complex the worth of shares. This theory emphasis on that values of shares is affected by the earnings of the company and not by the way earning is split into retained earnings and dividend pay-out. Modigliani-Miller approach is based on this model.

Assumptions of this model:

1. There exist no information barrier to investors and non existence of transactions cost,

2. Non existence of taxes on capital gains and dividends.

3. The company's investment policy is quite rigid.

4. The cost of floatation is non bearing.

The gist of MM principles can be postulated as below:

Shareholders worth of capital is enhanced if the company wishes to retain the income and not distribute in form of dividends, while the shareholder will get dividend if the company wishes to disburse the income.

The formula to calculate the market price per share in this model is:

P0= (D1+P1)/ 1+Ke

D1= Dividend to be received at the end of the period

P1=Market price per share at the end of the period

Ke= Cost of Equity capital or rate of capitalization

P0= Market price per share at the beginning of the period, or prevailing market price

## 21.6 LIMITATIONS OF M.M. HYPOTHESIS

This approach states that there is no bearing on the vested interests of the investors on the decision of the company that to either retain the income or distribute in the form of dividend. This approach is quite unpragmatic and unrealistic in nature since the market system tends to be imperfect in nature thus causing negations of MM assumptions.

**Perfect Capital Markets:**

This models assumption about perfect market existence is not real.

**Floatation costs:**

This model suggests that cost of raising capital from market is null where as in real life this is not the situation as various market forces assumes their cost in floating an issue.

**Transaction Costs:**

There exist various intermediaries which creates a quite space for transactional cost which this model has not taken in due consideration.

**Taxes:**

The model assumes that no taxes will be levied while in practicality this is not the case and government does regulate by levying taxes on transactions.

**Uncertainty:**

This model not takes due consideration about the ambiguity in the market. It assumes on the ability of the company to issue additional shares even in under pricing scenario of the market.

This model states that a firm can avoid dividend pay-out by issuing additional shares which seems to be under suspense.

There are two other approaches which affect dividend decision:

## 21.7 LINTNER'S MODEL

Litner concluded this famous study on actual dividend behaviour in the year 1956. The study concluded that investment needs are not so important for dividend decisions rather dividend distribution change affect the earnings of company. This study was done in two phase using interview method for data collection.

## 21.8 RADICAL APPROACH

This approach focussed on tax on earnings and dividend and concluded that if dividend is highly taxed than in that case dividend distribution is not preferred rather than capital gain is good and vice versa.

So these are the Dividend theories in practice.

## 21.9 SUMMARY

So these approaches shows that how dividend affect the valuation as well as retained earnings and future investments prospects. Relevance theory depicts that dividend are relevant for share valuation keeping certain assumptions as prerequisites. Whereas irrelevance theory explains that dividend are not so relevant for valuation of shares as investors are more concerned for future investments rather than current dividends.

## 21.10 GLOSSARY

**Dividend:** Dividend is a portion of income which is given by the company to its shareholders. It is a part of profit distributed by the firms to the stakeholders.

**Target payout ratio:** A stable dividend policy could target a long-run dividend-to-earnings ratio.

**Liquidity:** This denotes the ready cash available by the company so to meet the future or immediate needs.

**Cash Dividend:** This is the most preferred way of paying dividend. Under this dividend is paid in the form of cheque to the shareholders or to the brokerage firms.

**Stock Splits:** It is a process where a company divides its existing shares into multiple numbers of shares. In this method numbers of share increases whereas the market capitalization remains the same.

**Stock Dividend:** A stock dividend is a distribution of additional shares of stock to existing shareholders on a pro-rata basis i.e. so much stock for each share of stock held.

**Stable dividend**: It means when regular dividend is paid and there is consistency in dividend payment.

## 21.11REFERENCES


- Pandey I M-Financial Management (Vikas, 2004, 10th Ed.)
- Van Horne-Financial Management and Policy (Prentice hall, 2003, 12th Ed.)
- Prasanna Chandra-Fundamentals of Financial Management (TMH, 2004)


## 21.12 SUGGESTED READINGS


1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.
5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.
6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.
7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.

## 21.13 TERMINAL QUESTIONS

Q1. Enumerate the important parameters relevant to dividend decision making.

Q2. Differentiate between relevance and irrelevance theory.

Q3. Discuss the dividend policy and the various types of dividend policy.

Q4. The following information relates to BSNL Ltd.:

Earnings of the Company Rs 6, 00,000

Dividend payout Ratio 20%

No. of shares outstanding 2, 00,000

Rate of return on investment 8.5%

Equity capitalization rate 7%

Calculate:

a. Market Value Per Share by using Walter Model.

b. What is optimum dividend payout ratio?

c. What is market value of Company's share to payout ratio?

Q5. How far do you agree that dividends are irrelevant?

# UNIT 22 CONTEMPORARY ISSUES IN FINANCE



## 22.1 INTRODUCTION

Globalization of economy has created a lot of development in each and every disciple concerning human life. Globalization has also impacted the financial development weather its being financial market development or financial product development. Currently we see huge development in capital market and financial innovation understanding the relevance of such development is a paramount need. Understanding the technological development in financial product like bitcoins and other crypto currency is also important. How financial market evolved over the years and how it has impacted the Indian financial market is a matter of concern. This unit is designed keep in consideration the Indian financial system and the issues which are revolving around the financial system of India. This chapter provide an platform for students to investigate the forces shaping the contemporary financial system.

## 22.2 OBJECTIVES

After reading this unit, you would be able to;

- To understand the Indian financial system.

- To get insight of various contemporary issues of finance.
- To portray the different features of Indian Financial System.

## 22.3 CONTEMPORARY ISSUES IN FINANCE: AN OVERVIEW OF ORGANIZED FINANCIAL STRUCTURE AND SYSTEM IN INDIA

The crux of any Financials is dependent upon the system of any country is very important as it has tendency boosts savings and investments and thus helps in promoting economic development. Indian Financial System helps as a link between savers and borrowers, thus generating funds for investments. Indian Financial System is basically of two types that is formal and informal financial system.

Formal Financial system is a well organized and a developed financial system where major roles are played by Finance Ministry, the RBI and SEBI and other regulatory entities.

Whereas Informal system is managed by local lenders, brokers and other group of association which don't have a formal and a recognized body.

Indian Financial System is basically made of four major components which are financial services, financial institutions, financial markets and financial products.

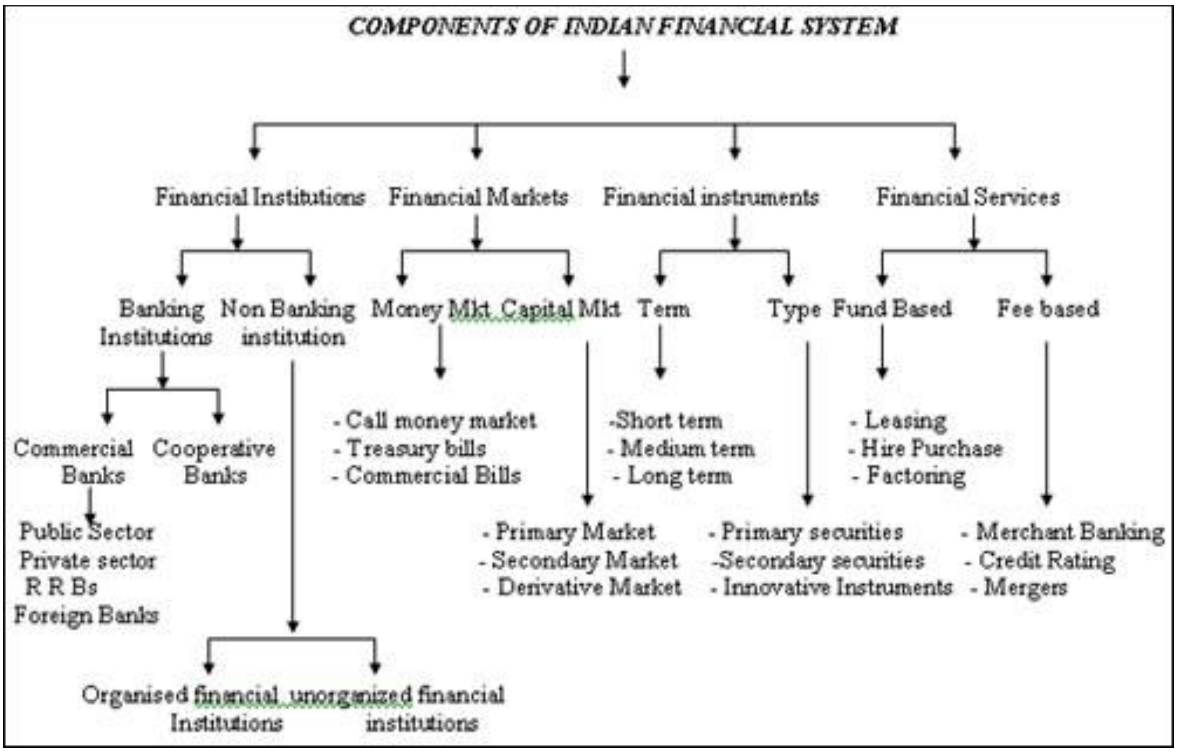



**Fig 22.1Overview of Indian Financial system:**

Next section covers the details of constituents of Indian Financial System.

## 22.4 FINANCIAL INSTITUTIONS

Financial Institutions plays the role of collecting deposits from the depositor and passing them to the borrowers or investing them in bonds, share markets and other investment avenues. They act as intermediaries of financial markets and promote ease of financial transactions.

Financial Institutions are segregated into two categories;

Banking and Non-Banking financial Institutions: Banking Institutions plays the role of collecting deposits from the people in return for interest and distributing the money to customers in the form of loans. In India banks are segregated into Private Banks, Public Banks and Foreign banks further segregation is done on the basis regional and cooperative banks.

Example: Public Bank like SBI, Private bank like HDFC, Foreign Banks like HSBC.

Non Banking Financial Institutions: This includes those financial firms which cannot collect direct money from the customers instead they sell financial products to customers like mutual fund companies , insurance firms and other brokerage firms.

Financial institutions are further classified into:

Regulatory institutions: These are formed to keep a vigil on financial institutions like SEBI (Security exchange board of India), AMFI (Association of Mutual Fund Industries) etc.

Intermediaries are commercial banks like SBI, Bank of India etc which take money in the form of deposits and lend them to customers in the form of loans.

Non Intermediaries: This segment include those banks which lend money only to corporate or for agriculture business, they don't take money from the individual consumers and don't perform normal banking activities. Example like NABARD( National Bank for agriculture and rural development), SIDBI( Small industrial development bank of India) etc.

Commercial Banks in India are majorly of three types:

Public Banks: Public banks are those banks which are run by government and where government hold the major stakes. Reserve bank of India is the central authority for public banks, few example of Public banks are State bank of India, Bank of India, Punjab National Bank etc.

Private Banks: Private Banks are fully or partially managed and operated by private bodies and institutions here majority stakes are with private holders. Some of the example of Private Banks is ICICI bank, HDFC bank etc.

Foreign Banks: This segment includes those banks which have their head office in some other countries and they have branches all over the world like HSBC bank, Citi bank etc.

## 22.5 FINANCIAL MARKETS

Financial Market includes those segments where financial products are bought and sold like shares, Bonds, Treasure bills etc.

Financial Markets are broadly segregated into two segments:

Money Market and Capital Markets:

Money market deals in short term and highly liquid securities which have a maturity period of less than one year. This market deals in certificate of deposits, Notes, Commercial papers and T-bills.

Capital Market on the other hands deals with security having a maturity period of more than one year or which are not so highly liquid, here those securities are issued which can be traded. Capital markets helps in collecting funds for investment it includes primary market where new securities are traded and Secondary market where old securities are traded. Capital market is characterised by number of participants including standalone investors and corporatized investors namely mutual funds, pension funds, govt. funds, hedge funds and other institutional investors.

Bond Market: It is security having fixed rate of interest issued by corporates to raise funds from the market.

Stock Market: It represents a market place where trading of shares of listed entities takes place. It is secondary financial markets where trading of already issued securities takes place.

Forex Market: This market represents trading of currencies at global level takes place. This market is quite liquid in nature.

Derivative Market: Derivatives are securities whose price is determined by an underlying asset. It includes futures, forward and spot trading.

## 22.6FINANCIAL INSTRUMENTS

Financial Instruments includes those assets which are traded in markets. These are formed with the objective of generating capital. They function as a contract between lenders and borrowers. Financial Instruments can be traded in the form of cash, tradable security or it can be in the form of part ownership.

### 22.6.1 TYPES OF FINANCIAL INSTRUMENTS

Financial Instruments are divided basically into two types i.e. on the basis of term and type. Here term denotes short time period instruments less than one year, medium term instruments which have a longer maturity between one to five years and very long term instruments maturity of more than five years. Example of Short term is treasury bills, commercial papers etc and for long term is bonds, loans etc.

Financial instruments are further classified into cash instruments and derivatives instruments. Cash based instruments derive their value directly from the market whereas derivatives instruments derive their value from the underlying instruments. Financial Instruments are also segregated into debt and equity on the basis of liability which they carry with them.

Debt instruments denoted loan and they carry liability of payments whereas equity denotes shares and the liability of payments is not attached with ordinary shares.

**Types of securities:**

Primary Securities:

Primary securities are those securities which are issued for the first time by the companies or by the government. They can be in the form of shares or bonds and these securities derive their values directly on the basis of markets. These types of securities are trade in the primary markets or new issue markets. Here company sell securities directly to investors in the form of IPOs (Initial Public Offerings)

Secondary Securities: This includes those securities which are already in the market and are getting traded. These securities are sold by the investors and are traded in the secondary markets. Like shares which are already issued and getting traded in stock markets.

Derivatives Securities:

Derivatives are those securities which are traded and which derive their value from underlying instruments. There are different types of derivatives like forward, futures, options and swaps.

## 22.7FINANCIAL SERVICES

This included the services which are provided by the professionals for management, investments and providing assistance for other financial matters. This help in getting a better and sound aid in organizing financial issues.

There are basically two types of Financial Services

1) Fund based
2) Fees Based

Fund Based Services:

Leasing:

Large business requires heavy investment in the form of plant, machinery, building etc; businessmen often become apprehensive of making or blocking such heavy investments. So they resort to financial service like leasing and Hire purchase.

Leasing is a method where large equipments like machineries or even land are taken on rent in the form of lease by the owners. In lease there are two parties' lessor who is the owner of the product and lessee who uses it and the contract between the two is called the lease contact.

Characteristics of lease:

1) Person can use the product without actually buying them.
2) Lease is generally for long period of time
3) Leases are in the form of professional contract.
4) Leases are done in exchange of certain charges.
5) Ownership remains with the lessor.

Hire Purchase:

Hire purchase is the method of buying the product on payment of instalments and ownership of goods is not transferred until the buyer pays the last instalment.

Example: Mr X want to buy a photocopy machine worth Rs 100000 from Mr Y. Mr X makes a condition with Mr Y that he will buy the good on instalments of Rs 110000 for ten months and till the payment of full money ownership of good will rest with Mr Y but Mr X will use the good and on paying the last instalment i.e. tenth instalment good will get transfer to Mr X.

The benefit of Hire purchase is that goods can be bought without payment of whole amount in a single time and also if in any condition the buyer is not able to make the instalments he can return the goods as ownership is not transferred.

Difference between Hire Purchase and Leasing:

Ownership:

In hire purchase ownership is transferred on the payment of last instalments whereas in lease ownership remains with the lessor and lessee can only use it.

Rental Payments:

In lease the rent include only the cost of using the product whereas in hire purchase the cost includes both principles as well as interest.

Time of Contracts:

In leasing the contracts are of longer duration whereas in hire purchase contracts are of comparatively shorter durations.

Tax:In the lease agreement, the total lease rentals are shown as expenditure by the lessee. In hire purchase, the hirer claims the depreciation of asset as an expense.

Repairs and maintenance: Repairs and maintenance lies with the lessee whereas in hire purchase repairs and maintenance lies with the hirer.

Amount of Finance: In leasing there is no down payment whereas in hire purchase there is a down payment.

Factoring:

Factoring is a financial service where a company sells its bill receivables to third party for collection. Third party makes immediate payments to company after charging commission or fees.

Suppose Company ABC sells goods on credit to Mr X for Rs 20000 on the condition that Mr X will make payment after 2 month. Now due to some unwanted situation company require the payments one month before so in that case they will sell the bill to factoring or third party, this third party will make the payment to Company ABC on behalf of Mr X and later than this factoring company will collect the payment from Mr X.

There are three parties in factoring i.e. the one who sell the receivables, the factor and debtor.

Types of Factoring:

Resource and Non resource factoring

Resource factoring: In recourse factoring factor provide full payment to the client irrespective the amount they receive from the debtor. They provide guarantee for non payment of debt.

Non resource factoring: In Non recourse factoring bad debt are not covered if payments are not received from the debtors than in that case such receivables are returned back to the company.

Fee Based Services:

Merchant banking:

Merchant banking is different from retail banking operations. It is basically providing wholesome banking and consultancy services to business firms. It involves managing their financials as well as taking strategic decision making for them. Merchant bankers are not only lenders but they also undertake activities like underwriting, registrar of issues, restructuring of business, executing business memorandums etc.

Merchant banking was first introduced by Grindlays banks in 1967.

These bankers are referred as Investment bankers in USA.. The notification of Ministry Of Finance in India defines Merchant Banker 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”.

Below mentioned are the major services offered by Merchant Bankers;

- Programme Management
- Debt Restructuring
- IPO management
- Managers, Consultants or Advisers to the Issue
- Underwriting of Public Issue
- Portfolio Management
- Financial Restructuring
- Off shore business management
- Non-resident financial services
- Loan Syndication
- Corporate Counselling and advisory services
- Placement and distribution

Credit Ratings:

- A Credit Rating Agency is a company that assigns ratings to the debtors according to their ability to pay back the debt in timely manner.
- These agencies provide highly essential risk assessment reports and analytical solutions and assign a definitive credit score to both individuals as well as organizations. These reports are considered important for getting the loan.
- Following are the Credit Rating Agencies of India:
- Credit Information Bureau India Limited (CIBIL)
- Credit Rating Information Services of India Limited (CRISIL)
- Investment Information and Credit Rating Agency of India (ICRA)
- Credit Analysis & Research Limited (CARE)
- Onida Individual Credit Rating Agency of India (ONICRA)
- Small and Medium Enterprises Rating Agency of India Limited (SMERA)
- Brickwork Ratings India Private Limited
- Equifax Credit Information Services Private Limited (ECIS)
- Experian India

Mergers:

Merger means when two companies are merged into one. Financial firms provide all kind of financial assistance to firms in their merger talks like the conditions of mergers, formalities related to mergers and also some time the cost specifics related to mergers.

# 22.8MAJOR CONTEMPORARY ISSUES IN FINANCE

Banking and the financial system is going through a great transformation, a lot of changes are taking place in the financial system with the advent of technology and globalization. Banking sector has also seen a great transformation after the banking sector reforms of 1990. List of certain contemporary issues which are prevailing in the current financial system are summarized below:

1) Banking Sector reforms: Post 90 and pre 90 has seen a great transformation in the banking sectors reforms, like asset classification and income recognition norms, interest deregulation, lowering of statutory liquidity ratio and cash reserve ratio as recommended by Narshimham committee. The period saw banks moving beyond brick and mortar branches to adopt innovative delivery channels including internet banking, ATMs, call centres, kiosks, Business Correspondents (BCs), etc. New products such as retail banking gained prominence. Banks have sought to grow, not just in terms of balance sheet size, but also in terms of greater penetration of banking services to the hitherto unbanked segments of the population. It is reasonable to say that banks have succeeded in rising up to the challenges posed by the unique needs of a transforming economy and have, in no small measure, contributed to the nation's economic progress

2) Globalization: Globalization and integration of economies have also affected the financial markets as market becomes more prone to financial crisis and competition from world markets.

3) Increased level of default loans: Increased competition and frequent distribution of loans created the problem of high nonperforming assets which is creating a dent on the performance of banks in the longer run.

4) Financial Crisis: As economies are linked and any disturbance in one economy affect the others financial system, thus financial system are more prone to contagious effect of financial crisis for example Greek financial crisis, U.S subprime crisis.

5) Technological Advancement: Banking and financial sector is going through a technological advancement phase like digitalization of Indian banking system and use of online portal for payments thus up gradation of banking system is required.

6) Moving toward Universal Banking: We are slowly moving toward the concept of small number of large banks rather than from large numbers of smaller banks. This concept will not only reduce the default and underperforming banks but will also strengthen the capital base of banking structure.

7) Strengthening of Regulatory framework: Financial markets in India have evolved, as has the regulatory framework for them, historically in the context of a primarily bank-dominated financial system. It was only after the financial reform process was initiated in the early nineties and the regulation of banks started getting aligned to the international best practices that gradually different market elements were introduced as part of the market development agenda. This agenda focused, first and foremost, on putting in place the requisite market microstructure in terms of institutions, technology, market participants and appropriate regulations

8) Goods and service Tax: Financial market is going through the phase of GST implementation. Good and service tax is an indirect tax which is designed to reduce the cascading effects of different types of indirect tax. Its proper implementation and fixing adequate tax rate is a prime issue for the economy.

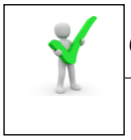
9) Financial Market cyber crimes: Financial market is always prone to cyber fraud like online theft, ransom attack so safeguarding the financial sector and preventing such attacks is a revolving issue for the financial sector.

10) Inflation and its affect on financial market: Economic conditions and rising inflation is also one of the issue from which financial sector is suffering so combating inflation and macro issues is also one of the issues of financial markets.

11) Introduction of Crypto Currency like Bitcoins,Ethereum etc. These are crypto currency which are made through complex computer networks and are used are payment only at recognized medium.

12) Microfinance and crowd funding: Microfinance is a very important aspect of financial inclusion. It involves lending micro credit services to poor section of the society who are distanced from traditional banking services. Microfinance service providers are categorised as non banking financial corporates who operates limited banking services to bottom of the society in affordable manner by providing loans through self help groups and is actively involved in raising the living conditions by infusing the some characteristic of earning their livelihood.

Peer-to-peer lending over the e-medium is another advancing trend in the financial sector, to which the fundamentals of microcredit have also been suffixed in addressing poverty as well as various non-poverty-related dogmas. Such efforts include platform based, a term describing the collective effort of individuals who network and pool their resources to support charities initiated by other people or organizations. The rules for crowd funding are still being evaluated, and the Securities Exchange Commission is taking due considerations in formalising a plan for it.



***Check Your Progress-A***

**Q1. What are the major services provide by Merchant Bankers?**

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**Q2. Why Micro finance is important for an economy?**

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**Q3. What is Crowd Funding?**

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## 22.9 SUMMARY

Thus what we can learn from this unit is that first our financial system depend upon financial institutions, financial products, and financial services, secondly with increased competitions and globalization we have seen a lot a changes in our financial system like changes in our banking system for example expansion of branches, increased use of ATM online mode of transaction, introduction of new norms like bankruptcy laws ,amendments in banking Act, introduction of new branches and introduction of private banks.

We have also witnessed a huge surge in both financial products and services like introduction of innovative products and services, increased in insurance and other investment avenues. We have also witnessed huge development both in the development of capital and financial markets. Apart from this other issue like financial inclusion; digitalization and consumer financial awareness is also one of the emerging issues of Indian financial market.

## 22.10 GLOSSARY

**Stock Market:** It represents a market place where trading of shares of listed entities takes place. It is secondary financial markets where trading of already issued securities takes place.

**Forex Market:** This market represents trading of currencies at global level takes place. This market is quite liquid in nature.

**Derivative Market:** Derivatives are securities whose price is determined by an underlying asset. It includes futures, forward and spot trading.

**Cryptocurrency:** A cryptocurrency (or crypto currency) is a digital asset designed to work as a medium of exchange

## 22.11 REFERENCES


- Pandey I M-Financial Management (Vikas, 2004, 10th Ed.)
- Van Horne-Financial Management and Policy (Prentice hall, 2003, 12th Ed.)
- Shapiro-Multinational Financial Management (Wiley Dreamtech)
- Sheebakapil-Fundamental of financial management (Pearson )
- Khan and Jain-Financial Management (Tata McGraw Hill, 3rdEd.)
- Prasanna Chandra-Fundamentals of Financial Management (TMH, 2004)
- Knott G-Financial Management (Palgrave, 2004)
- Lawrence J.Gitman–Principles of Managerial Finance (Pearson Education, 2004)
- R P Rustagi-Financial Management (Galgotia, 2000, 2nd revised Ed.)
- Lumen Boundless Finance (Trends and Issues in Finance)


## 22.12 SUGGESTED READINGS


1. Pandey I M-Financial Management (Vikas, 2004, 10th Ed.)
2. Van Horne-Financial Management and Policy (Prentice hall, 2003, 12th Ed.)
3. Shapiro-Multinational Financial Management (Wiley Dreamtech)
4. Sheebakapil-Fundamental of financial management (Pearson )
5. Khan and Jain-Financial Management (Tata McGraw Hill, 3rdEd.)
6. Prasanna Chandra-Fundamentals of Financial Management (TMH, 2004)

7. Knott G-Financial Management (Palgrave, 2004)
8. Lawrence J.Gitman–Principles of Managerial Finance (Pearson Education, 2004)
9. R P Rustagi-Financial Management (Galgotia, 2000, 2nd revised Ed.)
10. Lumen Boundless Finance (Trends and Issues in Finance)

## 22.13 TERMINAL QUESTIONS

Q1. Evaluate the emerging contemporary issue of finance in detail.

Q2. Discuss the financial system of India in detail covering all the aspects of Indian Financial System.

Q3. Pen down the difference between leasing and hire purchase

Q4. What do you understand by the term factoring and forfeiting.

Q5. Define the concept of Merchant banking with practical Example

Q6. Write a short note on Goods and Service Tax.

# *Appendix A: Financial Tables*

## APPENDIX A: FINANCIAL TABLES

Future Value Factors for One Rupee Compounded at *r* Percent for *n* Periods

/ Compounded Value Factor of a Lumpsum (CVF) of Re 1

$$FVF_{r\%,n} = (1+r)^n$$

| Period | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.010 | 1.020 | 1.030 | 1.040 | 1.050 | 1.060 | 1.070 | 1.080 | 1.090 | 1.100 | 1.110 | 1.120 | 1.130 | 1.140 | 1.150 |
| 2 | 1.020 | 1.040 | 1.061 | 1.082 | 1.103 | 1.124 | 1.145 | 1.166 | 1.188 | 1.210 | 1.232 | 1.254 | 1.277 | 1.300 | 1.323 |
| 3 | 1.030 | 1.061 | 1.093 | 1.125 | 1.158 | 1.191 | 1.225 | 1.260 | 1.295 | 1.331 | 1.368 | 1.405 | 1.443 | 1.482 | 1.521 |
| 4 | 1.041 | 1.082 | 1.126 | 1.170 | 1.216 | 1.262 | 1.311 | 1.360 | 1.412 | 1.464 | 1.518 | 1.574 | 1.630 | 1.689 | 1.749 |
| 5 | 1.051 | 1.104 | 1.159 | 1.217 | 1.276 | 1.338 | 1.403 | 1.469 | 1.539 | 1.611 | 1.685 | 1.762 | 1.842 | 1.925 | 2.011 |
| 6 | 1.062 | 1.126 | 1.194 | 1.265 | 1.340 | 1.419 | 1.501 | 1.587 | 1.677 | 1.772 | 1.870 | 1.974 | 2.082 | 2.195 | 2.313 |
| 7 | 1.072 | 1.149 | 1.230 | 1.316 | 1.407 | 1.504 | 1.606 | 1.714 | 1.828 | 1.949 | 2.076 | 2.211 | 2.353 | 2.502 | 2.660 |
| 8 | 1.083 | 1.172 | 1.267 | 1.369 | 1.477 | 1.594 | 1.718 | 1.851 | 1.993 | 2.144 | 2.305 | 2.476 | 2.658 | 2.853 | 3.059 |
| 9 | 1.094 | 1.195 | 1.305 | 1.423 | 1.551 | 1.689 | 1.838 | 1.999 | 2.172 | 2.358 | 2.558 | 2.773 | 3.004 | 3.252 | 3.518 |
| 10 | 1.105 | 1.219 | 1.344 | 1.480 | 1.629 | 1.791 | 1.967 | 2.159 | 2.367 | 2.594 | 2.839 | 3.106 | 3.395 | 3.707 | 4.046 |
| 11 | 1.116 | 1.243 | 1.384 | 1.539 | 1.710 | 1.898 | 2.105 | 2.332 | 2.580 | 2.853 | 3.152 | 3.479 | 3.836 | 4.226 | 4.652 |
| 12 | 1.127 | 1.268 | 1.426 | 1.601 | 1.796 | 2.012 | 2.252 | 2.518 | 2.813 | 3.138 | 3.498 | 3.896 | 4.335 | 4.818 | 5.350 |
| 13 | 1.138 | 1.294 | 1.469 | 1.665 | 1.886 | 2.133 | 2.410 | 2.720 | 3.066 | 3.452 | 3.883 | 4.363 | 4.898 | 5.492 | 6.153 |
| 14 | 1.149 | 1.319 | 1.513 | 1.732 | 1.980 | 2.261 | 2.579 | 2.937 | 3.342 | 3.797 | 4.310 | 4.887 | 5.535 | 6.261 | 7.076 |
| 15 | 1.161 | 1.346 | 1.558 | 1.801 | 2.079 | 2.397 | 2.759 | 3.172 | 3.642 | 4.177 | 4.785 | 5.474 | 6.254 | 7.138 | 8.137 |
| 16 | 1.173 | 1.373 | 1.605 | 1.873 | 2.183 | 2.540 | 2.952 | 3.426 | 3.970 | 4.595 | 5.311 | 6.130 | 7.067 | 8.137 | 9.358 |
| 17 | 1.184 | 1.400 | 1.653 | 1.948 | 2.292 | 2.693 | 3.159 | 3.700 | 4.328 | 5.054 | 5.895 | 6.866 | 7.986 | 9.276 | 10.761 |
| 18 | 1.196 | 1.428 | 1.702 | 2.026 | 2.407 | 2.854 | 3.380 | 3.996 | 4.717 | 5.560 | 6.544 | 7.690 | 9.024 | 10.575 | 12.375 |
| 19 | 1.208 | 1.457 | 1.754 | 2.107 | 2.527 | 3.026 | 3.617 | 4.316 | 5.142 | 6.116 | 7.263 | 8.613 | 10.197 | 12.056 | 14.232 |
| 20 | 1.220 | 1.486 | 1.806 | 2.191 | 2.653 | 3.207 | 3.870 | 4.661 | 5.604 | 6.727 | 8.062 | 9.646 | 11.523 | 13.743 | 16.367 |
| 21 | 1.232 | 1.516 | 1.860 | 2.279 | 2.786 | 3.400 | 4.141 | 5.034 | 6.109 | 7.400 | 8.949 | 10.804 | 13.021 | 15.668 | 18.822 |
| 22 | 1.245 | 1.546 | 1.916 | 2.370 | 2.925 | 3.604 | 4.430 | 5.437 | 6.659 | 8.140 | 9.934 | 12.100 | 14.714 | 17.861 | 21.645 |
| 23 | 1.257 | 1.577 | 1.974 | 2.465 | 3.072 | 3.820 | 4.741 | 5.871 | 7.258 | 8.954 | 11.026 | 13.552 | 16.627 | 20.362 | 24.891 |
| 24 | 1.270 | 1.608 | 2.033 | 2.563 | 3.225 | 4.049 | 5.072 | 6.341 | 7.911 | 9.850 | 12.239 | 15.179 | 18.788 | 23.212 | 28.625 |
| 25 | 1.282 | 1.641 | 2.094 | 2.666 | 3.386 | 4.292 | 5.427 | 6.848 | 8.623 | 10.835 | 13.585 | 17.000 | 21.231 | 26.462 | 32.919 |
| 30 | 1.348 | 1.811 | 2.427 | 3.243 | 4.322 | 5.743 | 7.612 | 10.063 | 13.268 | 17.449 | 22.892 | 29.960 | 39.116 | 50.950 | 66.212 |
| 35 | 1.417 | 2.000 | 2.814 | 3.946 | 5.516 | 7.686 | 10.677 | 14.785 | 20.414 | 28.102 | 38.575 | 52.800 | 72.069 | 98.100 | 133.176 |
| 40 | 1.489 | 2.208 | 3.262 | 4.801 | 7.040 | 10.286 | 14.974 | 21.725 | 31.409 | 45.259 | 65.001 | 93.051 | 132.782 | 188.884 | 267.864 |
| 45 | 1.565 | 2.438 | 3.782 | 5.841 | 8.985 | 13.765 | 21.002 | 31.920 | 48.327 | 72.890 | 109.530 | 163.988 | 244.641 | 363.679 | 538.769 |
| 50 | 1.645 | 2.692 | 4.384 | 7.107 | 11.467 | 18.420 | 29.457 | 46.902 | 74.358 | 117.391 | 184.565 | 289.002 | 450.736 | 700.233 | 1083.657 |

**Table A1 (*continued*)**

Future Value Factors for One Rupee Compounded at *r* Percent for *n* Periods

/ Compounded Value Factor of a Lumpsum (CVF) of Re 1

$FVF_{r\%,n} = (1+r)^n$

| Period | 16% | 17% | 18% | 19% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.160 | 1.170 | 1.180 | 1.190 | 1.200 | 1.250 | 1.300 | 1.350 | 1.400 | 1.450 | 1.500 |
| 2 | 1.346 | 1.369 | 1.392 | 1.416 | 1.440 | 1.563 | 1.690 | 1.823 | 1.960 | 2.103 | 2.250 |
| 3 | 1.561 | 1.602 | 1.643 | 1.685 | 1.728 | 1.953 | 2.197 | 2.460 | 2.744 | 3.049 | 3.375 |
| 4 | 1.811 | 1.874 | 1.939 | 2.005 | 2.074 | 2.441 | 2.856 | 3.322 | 3.842 | 4.421 | 5.063 |
| 5 | 2.100 | 2.192 | 2.288 | 2.386 | 2.488 | 3.052 | 3.713 | 4.484 | 5.378 | 6.410 | 7.594 |
| 6 | 2.436 | 2.565 | 2.700 | 2.840 | 2.986 | 3.815 | 4.827 | 6.053 | 7.530 | 9.294 | 11.391 |
| 7 | 2.826 | 3.001 | 3.185 | 3.379 | 3.583 | 4.768 | 6.275 | 8.172 | 10.541 | 13.476 | 17.086 |
| 8 | 3.278 | 3.511 | 3.759 | 4.021 | 4.300 | 5.960 | 8.157 | 11.032 | 14.758 | 19.541 | 25.629 |
| 9 | 3.803 | 4.108 | 4.435 | 4.785 | 5.160 | 7.451 | 10.604 | 14.894 | 20.661 | 28.334 | 38.443 |
| 10 | 4.411 | 4.807 | 5.234 | 5.695 | 6.192 | 9.313 | 13.786 | 20.107 | 28.925 | 41.085 | 57.665 |
| 11 | 5.117 | 5.624 | 6.176 | 6.777 | 7.430 | 11.642 | 17.922 | 27.144 | 40.496 | 59.573 | 86.498 |
| 12 | 5.936 | 6.580 | 7.288 | 8.064 | 8.916 | 14.552 | 23.298 | 36.644 | 56.694 | 86.381 | 129.746 |
| 13 | 6.886 | 7.699 | 8.599 | 9.596 | 10.699 | 18.190 | 30.288 | 49.470 | 79.371 | 125.252 | 194.620 |
| 14 | 7.988 | 9.007 | 10.147 | 11.420 | 12.839 | 22.737 | 39.374 | 66.784 | 111.120 | 181.615 | 291.929 |
| 15 | 9.266 | 10.539 | 11.974 | 13.590 | 15.407 | 28.422 | 51.186 | 90.158 | 155.568 | 263.342 | 437.894 |
| 16 | 10.748 | 12.330 | 14.129 | 16.172 | 18.488 | 35.527 | 66.542 | 121.714 | 217.795 | 381.846 | 656.841 |
| 17 | 12.468 | 14.426 | 16.672 | 19.244 | 22.186 | 44.409 | 86.504 | 164.314 | 304.913 | 553.676 | 985.261 |
| 18 | 14.463 | 16.879 | 19.673 | 22.901 | 26.623 | 55.511 | 112.455 | 221.824 | 426.879 | 802.831 | 1477.892 |
| 19 | 16.777 | 19.748 | 23.214 | 27.252 | 31.948 | 69.389 | 146.192 | 299.462 | 597.630 | 1164.105 | 2216.838 |
| 20 | 19.461 | 23.106 | 27.393 | 32.429 | 38.338 | 86.736 | 190.050 | 404.274 | 836.683 | 1687.952 | 3325.257 |
| 21 | 22.574 | 27.034 | 32.324 | 38.591 | 46.005 | 108.420 | 247.065 | 545.769 | 1171.356 | 2447.530 | 4987.885 |
| 22 | 26.186 | 31.629 | 38.142 | 45.923 | 55.206 | 135.525 | 321.184 | 736.789 | 1639.898 | 3548.919 | 7481.828 |
| 23 | 30.376 | 37.006 | 45.008 | 54.649 | 66.247 | 169.407 | 417.539 | 994.665 | 2295.857 | 5145.932 | 11222.741 |
| 24 | 35.236 | 43.297 | 53.109 | 65.032 | 79.497 | 211.758 | 542.801 | 1342.797 | 3214.200 | 7461.602 | 16834.112 |
| 25 | 40.874 | 50.658 | 62.669 | 77.388 | 95.396 | 264.698 | 705.641 | 1812.776 | 4499.880 | 10819.322 | 25251.168 |
| 30 | 85.850 | 111.065 | 143.371 | 184.675 | 237.376 | 807.794 | 2619.996 | 8128.550 | 24201.432 | 69348.978 | 191751.059 |
| 35 | 180.314 | 243.503 | 327.997 | 440.701 | 590.668 | 2465.190 | 9727.860 | 36448.688 | 130161.112 | 444508.508 | * |
| 40 | 378.721 | 533.869 | 750.378 | 1051.668 | 1469.772 | 7523.164 | 36118.865 | 163437.135 | 700037.697 | * | * |
| 45 | 795.444 | 1170.479 | 1716.684 | 2509.651 | 3657.262 | 22958.874 | 134106.817 | 732857.577 | * | * | * |
| 50 | 1670.704 | 2566.215 | 3927.357 | 5988.914 | 9100.438 | 70064.923 | 497929.223 | * | * | * | * |

*Not shown because of space limitations.

**Table A2**

Present Value Factors for One Rupee Discounted at *r* Percent for *n* Period/Present Value Factor of a Lumpsum (PVF) of Re 1

$PVF_{r\%,n} = 1/(1+r)^n$

| Period | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.990 | 0.980 | 0.971 | 0.962 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 |
| 2 | 0.980 | 0.961 | 0.943 | 0.925 | 0.907 | 0.890 | 0.873 | 0.857 | 0.842 | 0.826 | 0.812 | 0.797 | 0.783 | 0.769 | 0.756 |
| 3 | 0.971 | 0.942 | 0.915 | 0.889 | 0.864 | 0.840 | 0.816 | 0.794 | 0.772 | 0.751 | 0.731 | 0.712 | 0.693 | 0.675 | 0.658 |
| 4 | 0.961 | 0.924 | 0.888 | 0.855 | 0.823 | 0.792 | 0.763 | 0.735 | 0.708 | 0.683 | 0.659 | 0.636 | 0.613 | 0.592 | 0.572 |
| 5 | 0.951 | 0.906 | 0.863 | 0.822 | 0.784 | 0.747 | 0.713 | 0.681 | 0.650 | 0.621 | 0.593 | 0.567 | 0.543 | 0.519 | 0.497 |
| 6 | 0.942 | 0.888 | 0.837 | 0.790 | 0.746 | 0.705 | 0.666 | 0.630 | 0.596 | 0.564 | 0.535 | 0.507 | 0.480 | 0.456 | 0.432 |
| 7 | 0.933 | 0.871 | 0.813 | 0.760 | 0.711 | 0.665 | 0.623 | 0.583 | 0.547 | 0.513 | 0.482 | 0.452 | 0.425 | 0.400 | 0.376 |
| 8 | 0.923 | 0.853 | 0.789 | 0.731 | 0.677 | 0.627 | 0.582 | 0.540 | 0.502 | 0.467 | 0.434 | 0.404 | 0.376 | 0.351 | 0.327 |
| 9 | 0.914 | 0.837 | 0.766 | 0.703 | 0.645 | 0.592 | 0.544 | 0.500 | 0.460 | 0.424 | 0.391 | 0.361 | 0.333 | 0.308 | 0.284 |
| 10 | 0.905 | 0.820 | 0.744 | 0.676 | 0.614 | 0.558 | 0.508 | 0.463 | 0.422 | 0.386 | 0.352 | 0.322 | 0.295 | 0.270 | 0.247 |
| 11 | 0.896 | 0.804 | 0.722 | 0.650 | 0.585 | 0.527 | 0.475 | 0.429 | 0.388 | 0.350 | 0.317 | 0.287 | 0.261 | 0.237 | 0.215 |
| 12 | 0.887 | 0.788 | 0.701 | 0.625 | 0.557 | 0.497 | 0.444 | 0.397 | 0.356 | 0.319 | 0.286 | 0.257 | 0.231 | 0.208 | 0.187 |
| 13 | 0.879 | 0.773 | 0.681 | 0.601 | 0.530 | 0.469 | 0.415 | 0.368 | 0.326 | 0.290 | 0.258 | 0.229 | 0.204 | 0.182 | 0.163 |
| 14 | 0.870 | 0.758 | 0.661 | 0.577 | 0.505 | 0.442 | 0.388 | 0.340 | 0.299 | 0.263 | 0.232 | 0.205 | 0.181 | 0.160 | 0.141 |
| 15 | 0.861 | 0.743 | 0.642 | 0.555 | 0.481 | 0.417 | 0.362 | 0.315 | 0.275 | 0.239 | 0.209 | 0.183 | 0.160 | 0.140 | 0.123 |
| 16 | 0.853 | 0.728 | 0.623 | 0.534 | 0.458 | 0.394 | 0.339 | 0.292 | 0.252 | 0.218 | 0.188 | 0.163 | 0.141 | 0.123 | 0.107 |
| 17 | 0.844 | 0.714 | 0.605 | 0.513 | 0.436 | 0.371 | 0.317 | 0.270 | 0.231 | 0.198 | 0.170 | 0.146 | 0.125 | 0.108 | 0.093 |
| 18 | 0.836 | 0.700 | 0.587 | 0.494 | 0.416 | 0.350 | 0.296 | 0.250 | 0.212 | 0.180 | 0.153 | 0.130 | 0.111 | 0.095 | 0.081 |
| 19 | 0.828 | 0.686 | 0.570 | 0.475 | 0.396 | 0.331 | 0.277 | 0.232 | 0.194 | 0.164 | 0.138 | 0.116 | 0.098 | 0.083 | 0.070 |
| 20 | 0.820 | 0.673 | 0.554 | 0.456 | 0.377 | 0.312 | 0.258 | 0.215 | 0.178 | 0.149 | 0.124 | 0.104 | 0.087 | 0.073 | 0.061 |
| 21 | 0.811 | 0.660 | 0.538 | 0.439 | 0.359 | 0.294 | 0.242 | 0.199 | 0.164 | 0.135 | 0.112 | 0.093 | 0.077 | 0.064 | 0.053 |
| 22 | 0.803 | 0.647 | 0.522 | 0.422 | 0.342 | 0.278 | 0.226 | 0.184 | 0.150 | 0.123 | 0.101 | 0.083 | 0.068 | 0.056 | 0.046 |
| 23 | 0.795 | 0.634 | 0.507 | 0.406 | 0.326 | 0.262 | 0.211 | 0.170 | 0.138 | 0.112 | 0.091 | 0.074 | 0.060 | 0.049 | 0.040 |
| 24 | 0.788 | 0.622 | 0.492 | 0.390 | 0.310 | 0.247 | 0.197 | 0.158 | 0.126 | 0.102 | 0.082 | 0.066 | 0.053 | 0.043 | 0.035 |
| 25 | 0.780 | 0.610 | 0.478 | 0.375 | 0.295 | 0.233 | 0.184 | 0.146 | 0.116 | 0.092 | 0.074 | 0.059 | 0.047 | 0.038 | 0.030 |
| 30 | 0.742 | 0.552 | 0.412 | 0.308 | 0.231 | 0.174 | 0.131 | 0.099 | 0.075 | 0.057 | 0.044 | 0.033 | 0.026 | 0.020 | 0.015 |
| 35 | 0.706 | 0.500 | 0.355 | 0.253 | 0.181 | 0.130 | 0.094 | 0.068 | 0.049 | 0.036 | 0.026 | 0.019 | 0.014 | 0.010 | 0.008 |
| 40 | 0.672 | 0.453 | 0.307 | 0.208 | 0.142 | 0.097 | 0.067 | 0.046 | 0.032 | 0.022 | 0.015 | 0.011 | 0.008 | 0.005 | 0.004 |
| 45 | 0.639 | 0.410 | 0.264 | 0.171 | 0.111 | 0.073 | 0.048 | 0.031 | 0.021 | 0.014 | 0.009 | 0.006 | 0.004 | 0.003 | 0.002 |
| 50 | 0.608 | 0.372 | 0.228 | 0.141 | 0.087 | 0.054 | 0.034 | 0.021 | 0.013 | 0.009 | 0.005 | 0.003 | 0.002 | 0.001 | 0.001 |

**Table A2** ***(continued)***

Present Value Factors for One Rupee Discounted at *r* Percent for *n* Periods/ Present Value Factor of a Lumpsum (PVF) of Re 1

$PVF_{r\%,n} = 1/(1+r)^n$

| Period | 16% | 17% | 18% | 19% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 | 0.800 | 0.769 | 0.741 | 0.714 | 0.690 | 0.667 |
| 2 | 0.743 | 0.731 | 0.718 | 0.706 | 0.694 | 0.640 | 0.592 | 0.549 | 0.510 | 0.476 | 0.444 |
| 3 | 0.641 | 0.624 | 0.609 | 0.593 | 0.579 | 0.512 | 0.455 | 0.406 | 0.364 | 0.328 | 0.296 |
| 4 | 0.552 | 0.534 | 0.516 | 0.499 | 0.482 | 0.410 | 0.350 | 0.301 | 0.260 | 0.226 | 0.198 |
| 5 | 0.476 | 0.456 | 0.437 | 0.419 | 0.402 | 0.328 | 0.269 | 0.223 | 0.186 | 0.156 | 0.132 |
| 6 | 0.410 | 0.390 | 0.370 | 0.352 | 0.335 | 0.262 | 0.207 | 0.165 | 0.133 | 0.108 | 0.088 |
| 7 | 0.354 | 0.333 | 0.314 | 0.296 | 0.279 | 0.210 | 0.159 | 0.122 | 0.095 | 0.074 | 0.059 |
| 8 | 0.305 | 0.285 | 0.266 | 0.249 | 0.233 | 0.168 | 0.123 | 0.091 | 0.068 | 0.051 | 0.039 |
| 9 | 0.263 | 0.243 | 0.225 | 0.209 | 0.194 | 0.134 | 0.094 | 0.067 | 0.048 | 0.035 | 0.026 |
| 10 | 0.227 | 0.208 | 0.191 | 0.176 | 0.162 | 0.107 | 0.073 | 0.050 | 0.035 | 0.024 | 0.017 |
| 11 | 0.195 | 0.178 | 0.162 | 0.148 | 0.135 | 0.086 | 0.056 | 0.037 | 0.025 | 0.017 | 0.012 |
| 12 | 0.168 | 0.152 | 0.137 | 0.124 | 0.112 | 0.069 | 0.043 | 0.027 | 0.018 | 0.012 | 0.008 |
| 13 | 0.145 | 0.130 | 0.116 | 0.104 | 0.093 | 0.055 | 0.033 | 0.020 | 0.013 | 0.008 | 0.005 |
| 14 | 0.125 | 0.111 | 0.099 | 0.088 | 0.078 | 0.044 | 0.025 | 0.015 | 0.009 | 0.006 | 0.003 |
| 15 | 0.108 | 0.095 | 0.084 | 0.074 | 0.065 | 0.035 | 0.020 | 0.011 | 0.006 | 0.004 | 0.002 |
| 16 | 0.093 | 0.081 | 0.071 | 0.062 | 0.054 | 0.028 | 0.015 | 0.008 | 0.005 | 0.003 | 0.002 |
| 17 | 0.080 | 0.069 | 0.060 | 0.052 | 0.045 | 0.023 | 0.012 | 0.006 | 0.003 | 0.002 | 0.001 |
| 18 | 0.069 | 0.059 | 0.051 | 0.044 | 0.038 | 0.018 | 0.009 | 0.005 | 0.002 | 0.001 | 0.001 |
| 19 | 0.060 | 0.051 | 0.043 | 0.037 | 0.031 | 0.014 | 0.007 | 0.003 | 0.002 | 0.001 | * |
| 20 | 0.051 | 0.043 | 0.037 | 0.031 | 0.026 | 0.012 | 0.005 | 0.002 | 0.001 | 0.001 | * |
| 21 | 0.044 | 0.037 | 0.031 | 0.026 | 0.022 | 0.009 | 0.004 | 0.002 | 0.001 | * | * |
| 22 | 0.038 | 0.032 | 0.026 | 0.022 | 0.018 | 0.007 | 0.003 | 0.001 | 0.001 | * | * |
| 23 | 0.033 | 0.027 | 0.022 | 0.018 | 0.015 | 0.006 | 0.002 | 0.001 | * | * | * |
| 24 | 0.028 | 0.023 | 0.019 | 0.015 | 0.013 | 0.005 | 0.002 | 0.001 | * | * | * |
| 25 | 0.024 | 0.020 | 0.016 | 0.013 | 0.010 | 0.004 | 0.001 | 0.001 | * | * | * |
| 30 | 0.012 | 0.009 | 0.007 | 0.005 | 0.004 | 0.001 | * | * | * | * | * |
| 35 | 0.006 | 0.004 | 0.003 | 0.002 | 0.002 | * | * | * | * | * | * |
| 40 | 0.003 | 0.002 | 0.001 | 0.001 | 0.001 | * | * | * | * | * | * |
| 45 | 0.001 | 0.001 | 0.001 | * | * | * | * | * | * | * | * |
| 50 | 0.001 | * | * | * | * | * | * | * | * | * | * |

**PVF* is zero to three decimal places.

**PVF* is zero to three decimal places.

**Table A3**

Future Value Factors for a One-Rupee Ordinary Annuity Compounded at *r* Percent for *n* Periods/ CVAF of an Annuity of Re1

$$FVFA_{r\%,n} = PMT \times \frac{(1+r)^{n} - 1}{r}$$

| Period | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 2 | 2.010 | 2.020 | 2.030 | 2.040 | 2.050 | 2.060 | 2.070 | 2.080 | 2.090 | 2.100 | 2.110 | 2.120 | 2.130 | 2.140 | 2.150 |
| 3 | 3.030 | 3.060 | 3.091 | 3.122 | 3.153 | 3.184 | 3.215 | 3.246 | 3.278 | 3.310 | 3.342 | 3.374 | 3.407 | 3.440 | 3.473 |
| 4 | 4.060 | 4.122 | 4.184 | 4.246 | 4.310 | 4.375 | 4.440 | 4.506 | 4.573 | 4.641 | 4.710 | 4.779 | 4.850 | 4.921 | 4.993 |
| 5 | 5.101 | 5.204 | 5.309 | 5.416 | 5.526 | 5.637 | 5.751 | 5.867 | 5.985 | 6.105 | 6.228 | 6.353 | 6.480 | 6.610 | 6.742 |
| 6 | 6.152 | 6.308 | 6.468 | 6.633 | 6.802 | 6.975 | 7.153 | 7.336 | 7.523 | 7.716 | 7.913 | 8.115 | 8.323 | 8.536 | 8.754 |
| 7 | 7.214 | 7.434 | 7.662 | 7.898 | 8.142 | 8.394 | 8.654 | 8.923 | 9.200 | 9.487 | 9.783 | 10.089 | 10.405 | 10.730 | 11.067 |
| 8 | 8.286 | 8.583 | 8.892 | 9.214 | 9.549 | 9.897 | 10.260 | 10.637 | 11.028 | 11.436 | 11.859 | 12.300 | 12.757 | 13.233 | 13.727 |
| 9 | 9.369 | 9.755 | 10.159 | 10.583 | 11.027 | 11.491 | 11.978 | 12.488 | 13.021 | 13.579 | 14.164 | 14.776 | 15.416 | 16.085 | 16.786 |
| 10 | 10.462 | 10.950 | 11.464 | 12.006 | 12.578 | 13.181 | 13.816 | 14.487 | 15.193 | 15.937 | 16.722 | 17.549 | 18.420 | 19.337 | 20.304 |
| 11 | 11.567 | 12.169 | 12.808 | 13.486 | 14.207 | 14.972 | 15.784 | 16.645 | 17.560 | 18.531 | 19.561 | 20.655 | 21.814 | 23.045 | 24.349 |
| 12 | 12.683 | 13.412 | 14.192 | 15.026 | 15.917 | 16.870 | 17.888 | 18.977 | 20.141 | 21.384 | 22.713 | 24.133 | 25.650 | 27.271 | 29.002 |
| 13 | 13.809 | 14.680 | 15.618 | 16.627 | 17.713 | 18.882 | 20.141 | 21.495 | 22.953 | 24.523 | 26.212 | 28.029 | 29.985 | 32.089 | 34.352 |
| 14 | 14.947 | 15.974 | 17.086 | 18.292 | 19.599 | 21.015 | 22.550 | 24.215 | 26.019 | 27.975 | 30.095 | 32.393 | 34.883 | 37.581 | 40.505 |
| 15 | 16.097 | 17.293 | 18.599 | 20.024 | 21.579 | 23.276 | 25.129 | 27.152 | 29.361 | 31.772 | 34.405 | 37.280 | 40.417 | 43.842 | 47.580 |
| 16 | 17.258 | 18.639 | 20.157 | 21.825 | 23.657 | 25.673 | 27.888 | 30.324 | 33.003 | 35.950 | 39.190 | 42.753 | 46.672 | 50.980 | 55.717 |
| 17 | 18.430 | 20.012 | 21.762 | 23.698 | 25.840 | 28.213 | 30.840 | 33.750 | 36.974 | 40.545 | 44.501 | 48.884 | 53.739 | 59.118 | 65.075 |
| 18 | 19.615 | 21.412 | 23.414 | 25.645 | 28.132 | 30.906 | 33.999 | 37.450 | 41.301 | 45.599 | 50.396 | 55.750 | 61.725 | 68.394 | 75.836 |
| 19 | 20.811 | 22.841 | 25.117 | 27.671 | 30.539 | 33.760 | 37.379 | 41.446 | 46.018 | 51.159 | 56.939 | 63.440 | 70.749 | 78.969 | 88.212 |
| 20 | 22.019 | 24.297 | 26.870 | 29.778 | 33.066 | 36.786 | 40.995 | 45.762 | 51.160 | 57.275 | 64.203 | 72.052 | 80.947 | 91.025 | 102.444 |
| 21 | 23.239 | 25.783 | 28.676 | 31.969 | 35.719 | 39.993 | 44.865 | 50.423 | 56.765 | 64.002 | 72.265 | 81.699 | 92.470 | 104.768 | 118.810 |
| 22 | 24.472 | 27.299 | 30.537 | 34.248 | 38.505 | 43.392 | 49.006 | 55.457 | 62.873 | 71.403 | 81.214 | 92.503 | 105.491 | 120.436 | 137.632 |
| 23 | 25.716 | 28.845 | 32.453 | 36.618 | 41.430 | 46.996 | 53.436 | 60.893 | 69.532 | 79.543 | 91.148 | 104.603 | 120.205 | 138.297 | 159.276 |
| 24 | 26.973 | 30.422 | 34.426 | 39.083 | 44.502 | 50.816 | 58.177 | 66.765 | 76.790 | 88.497 | 102.174 | 118.155 | 136.831 | 158.659 | 184.168 |
| 25 | 28.243 | 32.030 | 36.459 | 41.646 | 47.727 | 54.865 | 63.249 | 73.106 | 84.701 | 98.347 | 114.413 | 133.334 | 155.620 | 181.871 | 212.793 |
| 30 | 34.785 | 40.568 | 47.575 | 56.085 | 66.439 | 79.058 | 94.461 | 113.283 | 136.308 | 164.494 | 199.021 | 241.333 | 293.199 | 356.787 | 434.745 |
| 35 | 41.660 | 49.994 | 60.462 | 73.652 | 90.320 | 111.435 | 138.237 | 172.317 | 215.711 | 271.024 | 341.590 | 431.663 | 546.681 | 693.573 | 881.170 |
| 40 | 48.886 | 60.402 | 75.401 | 95.026 | 120.800 | 154.762 | 199.635 | 259.057 | 337.882 | 442.593 | 581.826 | 767.091 | 1013.704 | 1342.025 | 1779.090 |
| 45 | 56.481 | 71.893 | 92.720 | 121.029 | 159.700 | 212.744 | 285.749 | 386.506 | 525.859 | 718.905 | 986.639 | 1358.230 | 1874.165 | 2590.565 | 3585.128 |
| 50 | 64.463 | 84.579 | 112.797 | 152.667 | 209.348 | 290.336 | 406.529 | 573.770 | 815.084 | 1163.909 | 1668.771 | 2400.018 | 3459.507 | 4994.521 | 7217.716 |

**Table A3 (*continued*)**

Future Value Factors for a One-Rupee Ordinary Annuity Compounded at *r* Percent for *n* Periods/CVAF of an Annuity of Re1

$$FVFA_{r\%,n} = PMT \times \frac{(1+r)^{n} - 1}{r}$$

| Period | 16% | 17% | 18% | 19% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 2 | 2.160 | 2.170 | 2.180 | 2.190 | 2.200 | 2.250 | 2.300 | 2.350 | 2.400 | 2.450 | 2.500 |
| 3 | 3.506 | 3.539 | 3.572 | 3.606 | 3.640 | 3.813 | 3.990 | 4.173 | 4.360 | 4.553 | 4.750 |
| 4 | 5.066 | 5.141 | 5.215 | 5.291 | 5.368 | 5.766 | 6.187 | 6.633 | 7.104 | 7.601 | 8.125 |
| 5 | 6.877 | 7.014 | 7.154 | 7.297 | 7.442 | 8.207 | 9.043 | 9.954 | 10.946 | 12.022 | 13.188 |
| 6 | 8.977 | 9.207 | 9.442 | 9.683 | 9.930 | 11.259 | 12.756 | 14.438 | 16.324 | 18.431 | 20.781 |
| 7 | 11.414 | 11.772 | 12.142 | 12.523 | 12.916 | 15.073 | 17.583 | 20.492 | 23.853 | 27.725 | 32.172 |
| 8 | 14.240 | 14.773 | 15.327 | 15.902 | 16.499 | 19.842 | 23.858 | 28.664 | 34.395 | 41.202 | 49.258 |
| 9 | 17.519 | 18.285 | 19.086 | 19.923 | 20.799 | 25.802 | 32.015 | 39.696 | 49.153 | 60.743 | 74.887 |
| 10 | 21.321 | 22.393 | 23.521 | 24.709 | 25.959 | 33.253 | 42.619 | 54.590 | 69.814 | 89.077 | 113.330 |
| 11 | 25.733 | 27.200 | 28.755 | 30.404 | 32.150 | 42.566 | 56.405 | 74.697 | 98.739 | 130.162 | 170.995 |
| 12 | 30.850 | 32.824 | 34.931 | 37.180 | 39.581 | 54.208 | 74.327 | 101.841 | 139.235 | 189.735 | 257.493 |
| 13 | 36.786 | 39.404 | 42.219 | 45.244 | 48.497 | 68.760 | 97.625 | 138.485 | 195.929 | 276.115 | 387.239 |
| 14 | 43.672 | 47.103 | 50.818 | 54.841 | 59.196 | 86.949 | 127.913 | 187.954 | 275.300 | 401.367 | 581.859 |
| 15 | 51.660 | 56.110 | 60.965 | 66.261 | 72.035 | 109.687 | 167.286 | 254.738 | 386.420 | 582.982 | 873.788 |
| 16 | 60.925 | 66.649 | 72.939 | 79.850 | 87.442 | 138.109 | 218.472 | 344.897 | 541.988 | 846.324 | 1311.682 |
| 17 | 71.673 | 78.979 | 87.068 | 96.022 | 105.931 | 173.636 | 285.014 | 466.611 | 759.784 | 1228.170 | 1968.523 |
| 18 | 84.141 | 93.406 | 103.740 | 115.266 | 128.117 | 218.045 | 371.518 | 630.925 | 1064.697 | 1781.846 | 2953.784 |
| 19 | 98.603 | 110.285 | 123.414 | 138.166 | 154.740 | 273.556 | 483.973 | 852.748 | 1491.576 | 2584.677 | 4431.676 |
| 20 | 115.380 | 130.033 | 146.628 | 165.418 | 186.688 | 342.945 | 630.165 | 1152.210 | 2089.206 | 3748.782 | 6648.513 |
| 21 | 134.841 | 153.139 | 174.021 | 197.847 | 225.026 | 429.681 | 820.215 | 1556.484 | 2925.889 | 5436.734 | 9973.770 |
| 22 | 157.415 | 180.172 | 206.345 | 236.438 | 271.031 | 538.101 | 1067.280 | 2102.253 | 4097.245 | 7884.264 | 14961.655 |
| 23 | 183.601 | 211.801 | 244.487 | 282.362 | 326.237 | 673.626 | 1388.464 | 2839.042 | 5737.142 | 11433.182 | 22443.483 |
| 24 | 213.978 | 248.808 | 289.494 | 337.010 | 392.484 | 843.033 | 1806.003 | 3833.706 | 8032.999 | 16579.115 | 33666.224 |
| 25 | 249.214 | 292.105 | 342.603 | 402.042 | 471.981 | 1054.791 | 2348.803 | 5176.504 | 11247.199 | 24040.716 | 50500.337 |
| 30 | 530.312 | 647.439 | 790.948 | 966.712 | 1181.882 | 3227.174 | 8729.985 | 23221.570 | 60501.081 | 154106.618 | 383500.118 |
| 35 | 1120.713 | 1426.491 | 1816.652 | 2314.214 | 2948.341 | 9856.761 | 32422.868 | 104136.251 | 325400.279 | 987794.463 | * |
| 40 | 2360.757 | 3134.522 | 4163.213 | 5529.829 | 7343.858 | 30088.655 | 120392.883 | 466960.385 | * | * | * |
| 45 | 4965.274 | 6879.291 | 9531.577 | 13203.424 | 18281.310 | 91831.496 | 447019.389 | * | * | * | * |
| 50 | 10435.649 | 15089.502 | 21813.094 | 31515.336 | 45497.191 | 280255.693 | * | * | * | * | * |

**Table A4**

Present Value Factors for a One-Rupee Ordinary Annuity Discounted at *r* Percent for *n* Periods

$$PVFA_{r\%,n} = \frac{PMT}{r} \times \left[1 - \frac{1}{(1+r)^n}\right]$$

| Period | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.990 | 0.980 | 0.971 | 0.962 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 |
| 2 | 1.970 | 1.942 | 1.913 | 1.886 | 1.859 | 1.833 | 1.808 | 1.783 | 1.759 | 1.736 | 1.713 | 1.690 | 1.668 | 1.647 | 1.626 |
| 3 | 2.941 | 2.884 | 2.829 | 2.775 | 2.723 | 2.673 | 2.624 | 2.577 | 2.531 | 2.487 | 2.444 | 2.402 | 2.361 | 2.322 | 2.283 |
| 4 | 3.902 | 3.808 | 3.717 | 3.630 | 3.546 | 3.465 | 3.387 | 3.312 | 3.240 | 3.170 | 3.102 | 3.037 | 2.974 | 2.914 | 2.855 |
| 5 | 4.853 | 4.713 | 4.580 | 4.452 | 4.329 | 4.212 | 4.100 | 3.993 | 3.890 | 3.791 | 3.696 | 3.605 | 3.517 | 3.433 | 3.352 |
| 6 | 5.795 | 5.601 | 5.417 | 5.242 | 5.076 | 4.917 | 4.767 | 4.623 | 4.486 | 4.355 | 4.231 | 4.111 | 3.998 | 3.889 | 3.784 |
| 7 | 6.728 | 6.472 | 6.230 | 6.002 | 5.786 | 5.582 | 5.389 | 5.206 | 5.033 | 4.868 | 4.712 | 4.564 | 4.423 | 4.288 | 4.160 |
| 8 | 7.652 | 7.325 | 7.020 | 6.733 | 6.463 | 6.210 | 5.971 | 5.747 | 5.535 | 5.335 | 5.146 | 4.968 | 4.799 | 4.639 | 4.487 |
| 9 | 8.566 | 8.162 | 7.786 | 7.435 | 7.108 | 6.802 | 6.515 | 6.247 | 5.995 | 5.759 | 5.537 | 5.328 | 5.132 | 4.946 | 4.772 |
| 10 | 9.471 | 8.983 | 8.530 | 8.111 | 7.722 | 7.360 | 7.024 | 6.710 | 6.418 | 6.145 | 5.889 | 5.650 | 5.426 | 5.216 | 5.019 |
| 11 | 10.368 | 9.787 | 9.253 | 8.760 | 8.306 | 7.887 | 7.499 | 7.139 | 6.805 | 6.495 | 6.207 | 5.938 | 5.687 | 5.453 | 5.234 |
| 12 | 11.255 | 10.575 | 9.954 | 9.385 | 8.863 | 8.384 | 7.943 | 7.536 | 7.161 | 6.814 | 6.492 | 6.194 | 5.918 | 5.660 | 5.421 |
| 13 | 12.134 | 11.348 | 10.635 | 9.986 | 9.394 | 8.853 | 8.358 | 7.904 | 7.487 | 7.103 | 6.750 | 6.424 | 6.122 | 5.842 | 5.583 |
| 14 | 13.004 | 12.106 | 11.296 | 10.563 | 9.899 | 9.295 | 8.745 | 8.244 | 7.786 | 7.367 | 6.982 | 6.628 | 6.302 | 6.002 | 5.724 |
| 15 | 13.865 | 12.849 | 11.938 | 11.118 | 10.380 | 9.712 | 9.108 | 8.559 | 8.061 | 7.606 | 7.191 | 6.811 | 6.462 | 6.142 | 5.847 |
| 16 | 14.718 | 13.578 | 12.561 | 11.652 | 10.838 | 10.106 | 9.447 | 8.851 | 8.313 | 7.824 | 7.379 | 6.974 | 6.604 | 6.265 | 5.954 |
| 17 | 15.562 | 14.292 | 13.166 | 12.166 | 11.274 | 10.477 | 9.763 | 9.122 | 8.544 | 8.022 | 7.549 | 7.120 | 6.729 | 6.373 | 6.047 |
| 18 | 16.398 | 14.992 | 13.754 | 12.659 | 11.690 | 10.828 | 10.059 | 9.372 | 8.756 | 8.201 | 7.702 | 7.250 | 6.840 | 6.467 | 6.128 |
| 19 | 17.226 | 15.678 | 14.324 | 13.134 | 12.085 | 11.158 | 10.336 | 9.604 | 8.950 | 8.365 | 7.839 | 7.366 | 6.938 | 6.550 | 6.198 |
| 20 | 18.046 | 16.351 | 14.877 | 13.590 | 12.462 | 11.470 | 10.594 | 9.818 | 9.129 | 8.514 | 7.963 | 7.469 | 7.025 | 6.623 | 6.259 |
| 21 | 18.857 | 17.011 | 15.415 | 14.029 | 12.821 | 11.764 | 10.836 | 10.017 | 9.292 | 8.649 | 8.075 | 7.562 | 7.102 | 6.687 | 6.312 |
| 22 | 19.660 | 17.658 | 15.937 | 14.451 | 13.163 | 12.042 | 11.061 | 10.201 | 9.442 | 8.772 | 8.176 | 7.645 | 7.170 | 6.743 | 6.359 |
| 23 | 20.456 | 18.292 | 16.444 | 14.857 | 13.489 | 12.303 | 11.272 | 10.371 | 9.580 | 8.883 | 8.266 | 7.718 | 7.230 | 6.792 | 6.399 |
| 24 | 21.243 | 18.914 | 16.936 | 15.247 | 13.799 | 12.550 | 11.469 | 10.529 | 9.707 | 8.985 | 8.348 | 7.784 | 7.283 | 6.835 | 6.434 |
| 25 | 22.023 | 19.523 | 17.413 | 15.622 | 14.094 | 12.783 | 11.654 | 10.675 | 9.823 | 9.077 | 8.422 | 7.843 | 7.330 | 6.873 | 6.464 |
| 30 | 25.808 | 22.396 | 19.600 | 17.292 | 15.372 | 13.765 | 12.409 | 11.258 | 10.274 | 9.427 | 8.694 | 8.055 | 7.496 | 7.003 | 6.566 |
| 35 | 29.409 | 24.999 | 21.487 | 18.665 | 16.374 | 14.498 | 12.948 | 11.655 | 10.567 | 9.644 | 8.855 | 8.176 | 7.586 | 7.070 | 6.617 |
| 40 | 32.835 | 27.355 | 23.115 | 19.793 | 17.159 | 15.046 | 13.332 | 11.925 | 10.757 | 9.779 | 8.951 | 8.244 | 7.634 | 7.105 | 6.642 |
| 45 | 36.095 | 29.490 | 24.519 | 20.720 | 17.774 | 15.456 | 13.606 | 12.108 | 10.881 | 9.863 | 9.008 | 8.283 | 7.661 | 7.123 | 6.654 |
| 50 | 39.196 | 31.424 | 25.730 | 21.482 | 18.256 | 15.762 | 13.801 | 12.233 | 10.962 | 9.915 | 9.042 | 8.304 | 7.675 | 7.133 | 6.661 |

**Table A4 (*continued*)**

Present Value Factors for a One-Rupee Ordinary Annuity Discounted at *r* Percent for *n* Periods/ CVAF of an Annuity of Re1

$$PVFA_{r\%,n} = \frac{PMT}{r} \times \left[1 - \frac{1}{(1+r)^n}\right]$$

| Period | 16% | 17% | 18% | 19% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 | 0.800 | 0.769 | 0.741 | 0.714 | 0.690 | 0.667 |
| 2 | 1.605 | 1.585 | 1.566 | 1.547 | 1.528 | 1.440 | 1.361 | 1.289 | 1.224 | 1.165 | 1.111 |
| 3 | 2.246 | 2.210 | 2.174 | 2.140 | 2.106 | 1.952 | 1.816 | 1.696 | 1.589 | 1.493 | 1.407 |
| 4 | 2.798 | 2.743 | 2.690 | 2.639 | 2.589 | 2.362 | 2.166 | 1.997 | 1.849 | 1.720 | 1.605 |
| 5 | 3.274 | 3.199 | 3.127 | 3.058 | 2.991 | 2.689 | 2.436 | 2.220 | 2.035 | 1.876 | 1.737 |
| 6 | 3.685 | 3.589 | 3.498 | 3.410 | 3.326 | 2.951 | 2.643 | 2.385 | 2.168 | 1.983 | 1.824 |
| 7 | 4.039 | 3.922 | 3.812 | 3.706 | 3.605 | 3.161 | 2.802 | 2.508 | 2.263 | 2.057 | 1.883 |
| 8 | 4.344 | 4.207 | 4.078 | 3.954 | 3.837 | 3.329 | 2.925 | 2.598 | 2.331 | 2.109 | 1.922 |
| 9 | 4.607 | 4.451 | 4.303 | 4.163 | 4.031 | 3.463 | 3.019 | 2.665 | 2.379 | 2.144 | 1.948 |
| 10 | 4.833 | 4.659 | 4.494 | 4.339 | 4.192 | 3.571 | 3.092 | 2.715 | 2.414 | 2.168 | 1.965 |
| 11 | 5.029 | 4.836 | 4.656 | 4.486 | 4.327 | 3.656 | 3.147 | 2.752 | 2.438 | 2.185 | 1.977 |
| 12 | 5.197 | 4.988 | 4.793 | 4.611 | 4.439 | 3.725 | 3.190 | 2.779 | 2.456 | 2.196 | 1.985 |
| 13 | 5.342 | 5.118 | 4.910 | 4.715 | 4.533 | 3.780 | 3.223 | 2.799 | 2.469 | 2.204 | 1.990 |
| 14 | 5.468 | 5.229 | 5.008 | 4.802 | 4.611 | 3.824 | 3.249 | 2.814 | 2.478 | 2.210 | 1.993 |
| 15 | 5.575 | 5.324 | 5.092 | 4.876 | 4.675 | 3.859 | 3.268 | 2.825 | 2.484 | 2.214 | 1.995 |
| 16 | 5.668 | 5.405 | 5.162 | 4.938 | 4.730 | 3.887 | 3.283 | 2.834 | 2.489 | 2.216 | 1.997 |
| 17 | 5.749 | 5.475 | 5.222 | 4.990 | 4.775 | 3.910 | 3.295 | 2.840 | 2.492 | 2.218 | 1.998 |
| 18 | 5.818 | 5.534 | 5.273 | 5.033 | 4.812 | 3.928 | 3.304 | 2.844 | 2.494 | 2.219 | 1.999 |
| 19 | 5.877 | 5.584 | 5.316 | 5.070 | 4.843 | 3.942 | 3.311 | 2.848 | 2.496 | 2.220 | 1.999 |
| 20 | 5.929 | 5.628 | 5.353 | 5.101 | 4.870 | 3.954 | 3.316 | 2.850 | 2.497 | 2.221 | 1.999 |
| 21 | 5.973 | 5.665 | 5.384 | 5.127 | 4.891 | 3.963 | 3.320 | 2.852 | 2.498 | 2.221 | 2.000 |
| 22 | 6.011 | 5.696 | 5.410 | 5.149 | 4.909 | 3.970 | 3.323 | 2.853 | 2.498 | 2.222 | 2.000 |
| 23 | 6.044 | 5.723 | 5.432 | 5.167 | 4.925 | 3.976 | 3.325 | 2.854 | 2.499 | 2.222 | 2.000 |
| 24 | 6.073 | 5.746 | 5.451 | 5.182 | 4.937 | 3.981 | 3.327 | 2.855 | 2.499 | 2.222 | 2.000 |
| 25 | 6.097 | 5.766 | 5.467 | 5.195 | 4.948 | 3.985 | 3.329 | 2.856 | 2.499 | 2.222 | 2.000 |
| 30 | 6.177 | 5.829 | 5.517 | 5.235 | 4.979 | 3.995 | 3.332 | 2.857 | 2.500 | 2.222 | 2.000 |
| 35 | 6.215 | 5.858 | 5.539 | 5.251 | 4.992 | 3.998 | 3.333 | 2.857 | 2.500 | 2.222 | 2.000 |
| 40 | 6.233 | 5.871 | 5.548 | 5.258 | 4.997 | 3.999 | 3.333 | 2.857 | 2.500 | 2.222 | 2.000 |
| 45 | 6.242 | 5.877 | 5.552 | 5.261 | 4.999 | 4.000 | 3.333 | 2.857 | 2.500 | 2.222 | 2.000 |
| 50 | 6.246 | 5.880 | 5.554 | 5.262 | 4.999 | 4.000 | 3.333 | 2.857 | 2.500 | 2.222 | 2.000 |

# Financial Management
# MS 109


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