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FINANCIAL PLANNING:
A READY RECKONER

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To
My parents for their blessings
My children—Pratima and Rohan for their encouragement
My readers

Preface

Financial Planning is a relevant and customer centric approach for matching cash flows to meet an individual's life goals. Today in most of the developed countries it is the prevalent approach of investment advisory. In India, quite a few institutions teach financial planning and wealth management.

Financial planning as a concept took root in the US. Everyone who earns needs a good financial planner to help him achieve various financial goals. Previously in India, investors invested most of their surplus money in fixed income instruments on the advice of insurance/mutual fund advisors, which was product driven. On the other hand a certified financial planner provides integrated solutions and value based advice. He provides need based advice by identifying financial goals of his clients arising at different stages of his life. He advises on insurance requirement, retirement planning, children's education planning, providing for their marriage, buying a home, buying a car, asset allocation, taxation planning and even estate planning.

This book is a guiding tool for practising professionals who want to advise their clients on best investments through financial planning route. It will also help students intending to make their career in this field.

The book starts with introduction and basic concepts related to financial planning, covering the need and processes. Following chapters cover different mathematical models and tools such as time value of money, annuity/SIP, net present value, IRR, calculation of returns, use of financial calculator/excel sheets, etc. used as an effective mean to determine the desired values. The different financial goals like children's education, house, car, tax planning, providing for life after retirement, estate building, etc. are covered in details in the ensuing chapters. The various products that are available and right investment approach to meet these financial goals have been presented. How to deal with these different financial goals for different individuals have been elucidated with many case studies. Mutual fund and other investment products have also been discussed in detail. Retirement planning, the most important and often neglected financial goal in India has been discussed. Construction, revision of financial plan has been been comprehensively covered. As practising professionals are required to follow certain rules and code of ethics as stipulated by the governing body (FPSB, India), the same is outlined.

The book also includes 350 question and answers on time value of money and numerical problems on retirement planning. Use of financial calculator and excel has also been demonstrated in a user friendly manner at many places.

I am sure as the readers will probe further into the literature of the book, they will find new vistas of financial wisdom.

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I would like to express my thanks to my students.

I would also like to thank NDTV, CNBC, Zee Business, *The Indian Express, The Hindustan Times* and their team of professionals who gave me an opportunity to interact with the investing community.

I am obliged to my teachers and guide Mr. G D Sethi and Dr. Vinod Kumar for their continued support, Mr. Anish Wig, CEO ICFP for his guidance and support, Ruchi Nair, Mithilesh and my other colleagues at ICFP.

I am thankful to Mr. Niamatullah, Ms. Ritu Nanda (RNIS) who gave me the opportunity to gather and disburse knowledge.

I am highly grateful to my husband for his continued support and inspiration. I express my thanks to my friends, colleagues, family members, relatives who gave me immense confidence while the book was being written.

International College of Financial Planning (ICFP) provided me the opportunity to gather knowledge from a set of already experienced financial executives undergoing CFP programme as well as over 1500 students. The interaction with the students made me understand real world problems which I have tried to dissect in the minutest detail in this book.

I am thankful to FPSB India for allowing me to include "Code of Ethics to be followed by financial planners" as a chapter in my book.

Most of all, I am grateful to my readers who put their faith in me and are reading this book.

Madhu Sinha

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CHAPTER

1

Introduction to Financial Planning

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- ❑ *The concept of financial planning and financial planners*
- ❑ *How financial planners are remunerated*
- ❑ *Need for financial planning advice*
- ❑ *The six step process of financial planning*
- ❑ *The format of a written financial plan*

1.1 WHAT IS FINANCIAL PLANNING?

Financial planning is the process of assessing the financial goals of a client that arise at different intervals in his life, taking into account an inventory of the investments and other assets he already has to help him achieve those goals and estimating what he will need in the future. The objective of financial planning is to ensure that the right amount of money is available to the investor at the right time to enable him to meet the different goals in his life. These may be:

- Saving to buy a car costing around Rs. 3,50,000 after 3 years
- Purchasing a flat after 6 years with accumulated funds worth Rs. 10,00,000 and the balance with a loan
- Investing for higher education of children where the money is required after 10 and 12 years

- Protecting the family through insurance
- Planning for retirement and to meet expenses for 25 years after retirement
- Managing debt
- Investing to save taxes in an efficient manner
- Passing on wealth to the next generation (estate planning), etc.

Financial planning is a broader term than mere investment advice/ recommendations and subsequent placement of funds. It is comprehensive planning which covers all aspects of a client's financial well being from wealth creation to wealth protection; selecting products to suit specific needs; monitoring and reviewing his financial situation on a regular basis and revising the plan if required. Financial planning is simply arranging finances keeping in mind the financial goals, i.e. taking a goal-oriented approach and mapping out appropriate strategies to realize them as defined by the client.

Financial planning also includes:

- Using a monthly spending plan or budget to keep finances on track
- Making decisions about the job and its benefits
- Getting the most out of other financial resources, including insurance and employer provided benefits
- Saving and investing money
- Controlling expenses and staying out of debt
- Planning for estate transfer

1.2 THE NEED FOR FINANCIAL PLANNING

Why do we need financial planning? Subconsciously, we all know what our life goals are. The need for financial planning arises from the need to meet the financial goals that enable the achievement of one's life goals. These are determined by one's understanding of the present situation, status, income level, wealth, responsibilities, aspirations, risk profile, ability to save, past and present lifestyle, etc. Financial planning requires a thorough analysis of an individual's current position.

Over the last few years, the need for financial planning has been driven by the changes in the Indian financial markets. Equity and debt markets have become dynamic and more volatile due to global and local factors. Indian markets have become more integrated with the global financial markets, thus calling for constant monitoring of the markets as well as the client's financial situation. The investment options are also increasing and now include bank deposits, bonds, mutual funds, equities, derivatives, gold, real estate and equities of foreign companies. The universe of investment options is likely to expand further.

Reforms have put more money in the hands of investors but only a few people have the time and expertise to make a complete financial plan for themselves. Hence, there is the need to take the help of a professional financial planner who can guide individuals to achieve their financial goals.

Education levels and the average age of investors are increasing. This means that the working span and post-retirement span is almost equal. One therefore has to save more and invest wisely to ensure security throughout retirement after meeting all the earlier goals properly. Comprehensive financial planning can go a long way in assisting investors to build financial security for themselves and their families.

1.3 WHO IS A FINANCIAL PLANNER?

A financial planner is a person who uses the financial planning process to enable the client to achieve his financial objectives. A professional financial planner is one who is well-informed and understands the universe of the various investment options available as well as the risks and return attributes of these options.

The advice of a good financial planner to manage one's finances can help to avoid investment mistakes that can seriously damage one's financial health.

It is essential to plan one's finances prudently throughout the earning phase of one's life in order to meet the goals arising at different intervals of life and also to save money for post-retirement expenses without having to cut down on "annual living costs".

Financial planning professionals are a disciplined group of individuals who adhere to ethical and regulatory standards, possess specialized knowledge and skills, and apply these in the interest of individuals who wish to benefit from them. A financial planner inculcates the discipline of saving regularly among his clients.

1.4 REMUNERATION OF FINANCIAL PLANNERS

Financial planners may be of the following types

- Commission-based financial planners: Who act as brokers/Mutual Fund advisors/Insurance advisors and are compensated by the financial institutions with whom they place the client's funds
- Fee-based financial planners: Who charge a fee for making a comprehensive financial plan and do not get commission from institutions
- Combination of both: Who charge a fee from the client as well as get commission from the institutions where they place the client's funds

According to the practice standards and due to the application of a code of ethics, a certified financial planner is required to disclose what he is going to earn and from whom.

1.5 WHO NEEDS FINANCIAL PLANNING ADVICE?

Any person who earns money either in the form of salary income or in any other form and has financial goals to achieve, needs financial planning advice from a qualified financial planner. He will provide the client with a model portfolio, allocate assets depending upon risk and reward trade-off and help the client to meet various goals of life and build wealth over a period of time.

Even a young, unemployed person may need the help of a financial planner to invest money which he may receive in the form of cash gifts on special occasions. Each person has a stage in his life cycle, namely childhood, young adult, married with dependents, pre-retirement and post-retirement. The ability to save and invest, the capacity to take risk and the time horizon depends on the life cycle stage he is at.

Financial planning recommendations will therefore be different for different groups of investors. Before recommending any product to the client a financial planner does his own research on various types of investments, their risk and reward features and suggests those that match with the objectives of the client. The financial planner helps in improving the financial position of his clients.

The principle of comprehensive financial planning applies equally to people of all ages and professions.

1.6 WHO IS A SUCCESSFUL FINANCIAL PLANNER?

There are many qualities and attributes of financial planners, which distinguish them from other financial advisors. These are:

- Technical skills
- Interpersonal skills
- Professionalism

Technical skills Technical skills are achieved by pursuing a professional education programme for "Certified Financial Planner". There is a commitment by professionals for ongoing education and professional development to maintain and improve technical competencies. All certified financial planners are required to earn CE (continuous education) points every year in order to fulfill the requirement of continuing education and professional development.

Interpersonal skills While technical skills are acquired to become a successful financial planner, interpersonal skills are equally important. The profession is based on dealing with people who may choose to remain clients as well as refer

new clients to the financial planner who is successful in maintaining good relations and is able to communicate well with clients, has good listening skills, understands the fears and worries of clients and tries to help in difficult times. When people's skills are inherent in the financial planner, clients tend to rely on his advice and feel a level of comfort with him.

Professionalism This is an attribute found in successful financial planners. Professionalism implies that the interests of the client are of paramount importance and a financial planner carries out his duties in a correct manner, bearing in mind that he has a relationship of trust and confidence with the client.

1.7 COMPREHENSIVE FINANCIAL PLANNING—A SIX-STEP PROCESS

Comprehensive financial planning is a much broader term and implies more than mere investment advice and subsequent placement of funds. To provide a comprehensive financial planning service, the financial planner will need to carry out a thorough and detailed analysis of the client's current financial situation.

After this, he will prepare recommendations that will strengthen the client's position and present his advice in a manner which is clearly understood by the client. The process of implementation will start only after the client accepts and agrees to the proposals. After implementation the plan should be reviewed on a regular basis keeping in mind the changed circumstances of the client, developments on the economic front, and any alterations in the client's priorities/goals.

Comprehensive financial planning is a six-step process and is followed by financial planners the world over.

BOX

1. Establishing the relationship
2. Data gathering and goal setting
3. Identification of financial problems
4. Preparation of written alternatives and recommendations
5. Implementation of agreed recommendations
6. Review and revision of the plan

We will discuss all the steps in detail.

1. Establishing the Relationship

The first step in the formulation of a financial plan is to establish a relationship and obtain the trust and confidence of the client. Only when this is done will the

client share his financial information with his planner. A successful relationship with the client can be built by following commitments, respecting confidentiality and demonstrating interest in his financial well-being.

A financial planner should make a conscious effort to have informal contacts with clients and ask open-ended questions that encourage others to give their points of view. A professional financial planner should practice effective listening and foster an environment of openness and trust which is the basis of financial planning. A good financial planner should have effective communication skills. To earn the trust and confidence of the client he has to act honestly and with integrity at all times in accordance with the code of ethics and rules of professional conduct as laid down by the Financial Planning Standards Board (FPSB), India.

2. Data Gathering and Goal Setting

After a relationship of trust has been built, the next step of financial planning is to identify the investment objectives of an individual. The financial goals can be segregated into:

- Short term goals
- Medium term goals
- Long term goals

Each of the goals has a time frame and an amount attached to it. Some goals have priority over others. Goals and objectives should be quantified in terms of money, for example, I wish to spend Rs. 10 lakh on the marriage of my daughter which will take place any time after 12 years or, I wish to save Rs. 8 lakh for my son's education which he will require after 8 years, etc. These goals should be realistic.

Goals and objectives give focus, vision and direction for the financial planning process. Another important factor is to determine the risk tolerance of the client. The risk absorbing capacity of a person depends on his income level, age, liabilities, attitude towards risk and the time horizon.

The data that is gathered from the client about his existing financial position should be accurate and complete; without this it will be difficult for a financial planner to make a comprehensive financial plan and provide recommendations which will enable the client to achieve his goals at the appropriate time.

Two types of information are to be gathered from a client:

- Quantitative information
- Qualitative information

Quantitative information is factual in nature and will include:

- List of assets and liabilities
- Short term needs
- Existing insurances, if any

- Current income
- Current expenditure
- Time frame for major events/goals
- Existence of wills
- Specific income requirements after retirement
- Present liabilities

Qualitative information is important in framing recommendations and is not factual. It will include:

- Risk tolerance
- Attitude towards inflation protection
- Financial strengths and weaknesses
- Personal long term goals
- Attitude towards accumulation of wealth
- Taxation
- Liquidity consideration
- Concern about leaving the estate for the next generation
- Attitude towards various sectors/investment types
- Any hopes and fears
- Ease of management

Quantitative information can be gathered with the help of a questionnaire, which will be filled by the client and qualitative information can be gathered through file notes and may be inferred from the client's statements and comments during meetings. The financial planner may also prepare a set of questions that will help him to measure the risk tolerance level of his clients.

At the time of setting goals the financial planner should also make the client known about the investment risk and also seek understanding of his attitude towards this.

3. Identification of Financial Problems

The third step in the financial planning process is evaluation of the client's current financial position in terms of income, expenditure, assets, liabilities, income protection, insurances, etc. The purpose of this is to identify the strengths and weaknesses of the client's position. Once income and expenditure have been determined a budget can be developed. This helps a person to increase his income and reduce expenses so that there are sufficient savings to meet the various goals of life. The financial planner should address the following issues while identifying financial problems.

- Does the client have all the required insurances in place, that is, does he have a life insurance policy (if he has dependents), a household policy, a mortgage redemption policy (if he has taken a housing loan), a medical

insurance policy, or a professional liability policy (if he is working as a professional)?

- Is the current asset allocation in line with his risk appetite and does it have the potential to generate sufficient returns to meet all his life's goals? Identify the weakness and steps to be taken to make the asset allocation suitable for his needs.
- Does the time horizon of investment match with the time period of goals and needs?
- Is the liquidity as provided in the investment sufficient to meet unexpected expenses?
- Has the client invested in tax saving instruments that efficiently save tax and also generate returns, which enable him to meet his commitments?
- Does the client have sufficient assets to cover all his liabilities?
- Can the client save more money by curtailing some expenses? This means studying the budget (income and expenses) and finding the shortcomings, if any.
- Has the client made proper arrangements to transfer wealth after his death, i.e. preparation of wills and power of attorneys?

4. Preparation of Written Alternatives and Recommendations

This step relates to the preparation of alternatives and recommendations that will enable the client to meet all the commitments/goals as and when they arise. It will focus on improving the areas that are not properly in place and deciding an appropriate asset allocation pattern. Asset allocation means maintaining a spread between different asset classes such as equity, debt, liquid money, etc. If a client is young and earning a reasonably good salary, he may be advised to invest a greater percentage of funds in equity and less in debt as he has a long term time horizon and his risk-taking capacity will be more.

In case of a client who has retired, a larger percentage of funds should be invested in debt and income producing funds, as he needs regular income to meet his annual living expenses. The asset allocation, which is determined on the basis of the client's age, risk appetite, time horizon and goals, is called strategic asset allocation.

Asset allocation strategy focuses on maintaining a balance between all major asset classes in order to meet the investor's financial objectives.

Investors are divided into five categories depending on the risk appetite.

- Conservative
- Moderately conservative
- Balanced
- Moderately aggressive
- Aggressive

Conservative For a conservative investor, preservation of capital is most important and he wants a high level of secured income. Capital growth on a conservative portfolio will be moderate.

Moderately conservative This type of client has a focus on secure income and modest level of capital growth. Capital growth on a moderately conservative portfolio will be better than on a conservative portfolio.

Balanced This type of client has a balanced view on secured income and capital growth. The income from a balanced portfolio will be better than a moderately conservative portfolio.

Moderately aggressive This category of client wants growth of his portfolio rather than secured income. He is willing to accept short term fluctuations in his portfolio.

Aggressive An aggressive investor is ready to bear extra risk in the form of exposure to equity in order to get higher returns. The aggressive portfolio can face high short term fluctuations in the portfolio value.

After the most appropriate asset allocation has been decided for a client, the next step is to decide on the sectors within each asset class. For example, if it has been decided to invest say 30% in fixed income securities then a decision has to be taken regarding which sectors to choose, e.g. government securities, bond funds of mutual funds, bonds of rated companies, etc.

After deciding the asset allocation and investment sectors, the next step is to select particular investment products within each sector. While choosing particular schemes or products, attention has to be given to the risk factors associated with each scheme. Adequate diversification is the key to diversify risk. Proper attention has to be paid to ensure that the investor has access to money, i.e. liquidity is available in some of the schemes to meet expenses that may arise suddenly during the client's life.

After the written recommendations have been prepared in accordance with the client's needs, goals and objectives, the next step is to discuss the written recommendations with the client. The plan will be presented in a language that is easily understood by him. The rationale for the recommendations should be explained clearly. After the client has understood the recommendations and the risk factors associated with each investment, the financial planner will discuss the implementation of the plan.

The plan should be in a written form. This gives the client the opportunity to understand the advice; verbal recommendations absorbed and retained by the client which tend to reduce with the passage of time. Written recommendations also give legal protection to the financial planner and become a basis for future planning.

5. Implementation of Agreed Recommendations

Once the written plan has been presented to the client in a comprehensible form and agreed to by the client, the next step is to implement the plan. Before actual implementation (placement of funds) starts, the client will be required to sign a "Letter of Engagement" and "Authority to Proceed".

The following will be part of the implementation process.

- To fill up forms for mutual fund investments, fixed instrument investment, enclosure of cheques, etc.
- Withdrawal from some of the earlier schemes owned by the client, which are not worthy investments and to submit redemption requests
- Filling up forms for either investing in required insurances or increasing the amount of insurance if it is not adequate.
- To help in making wills and power of attorney.

After placement of funds it is the duty of the financial planner to check with the client whether he has received all the certificates/account statements/proofs of investments.

6. Review and Revision of the Plan

The final and most crucial step in the process of financial planning is the monitoring and periodic review of the plan. Any plan which is not reviewed at least once in six months or annually can become a failure. A periodic review is required to see whether the asset allocation is successfully moving towards the achievement of goals. It will also include revision of the portfolio or re-balancing the portfolio. Re-balancing the portfolio means shifting from poor performing assets to better performing assets. The following changes may necessitate the review of financial plans at frequent intervals as decided between the client and the financial planner.

- Changes at the level of the economy or at the macro level
- Changes at the level of the client or at the micro level

Changes at the Macro level

- Share markets may rise or fall
- Interest rates may change
- Taxation legislation may change drastically
- Value of currency may change favorably or unfavorably
- Inflation may rise or fall
- Economies will move in cycles
- Investment performance of companies may change depending on performance of economy

Changes at the Micro Level

- Income level may change calling for review
- Annual living expenses may increase
- The client may get a promotion and increase in salary income
- The client may start earning more through business income
- Changes in financial goals
- Changes in the risk tolerance level
- Client may get sudden wealth or he may lose wealth in a calamity
- The client may suffer injury and disability
- The client may lose his job

All these changes at the economy level and personal circumstances require a need to review and revise the financial plan made initially.

A client's situation does not always remain the same, but is constantly changing. Some clients may face many changes in their lives and others may not be impacted much. Any major change in circumstances calls for review and revision of the plan. A change in taxation and superannuation legislation may affect some of the investments adversely, thus calling for a review.

Many new products are launched by mutual fund houses and Insurance companies. Information about these should be given to the client on a regular basis. For example, the financial planner and client may have agreed that a review will be done on a yearly basis but during this period the financial planner comes across some schemes where the objective matches the client's objective and risk appetite; it is important that the client is informed about the new product.

Assume that a financial planner's client is a regular investor for a pension fund and this scheme has become less attractive because of some legislative changes adversely impacting it. This calls for a meeting with the client to discuss this issue and if required switch over from this scheme. The provision of ongoing monitoring is the foundation for a long term relationship with the client as well as of commercial benefit to the financial planner and the client. Happy and satisfied clients will develop business for the planner in the form of referrals.

1.8 FORMAT OF A WRITTEN FINANCIAL PLAN

A financial plan is simply a snapshot of your financial situation and a game plan of how to get where you want to go. To draw up a financial plan, you need to identify what you want to do with your life and estimate how much it is going to cost. You project future living costs and investment returns and revisit the numbers periodically, at least once a year.

The beauty of a financial plan whether done by a professional or ourselves is that it lets us see whether we are on track to meet our goals.

Sometimes a plan will let you see dreams you did not dare to dream. A written plan can reduce unnecessary anxiety while also alerting us if we are straying off course.

A financial plan can help make dreams come true. The financial plan should be presented in a written format for two reasons. Firstly, it gives ample time for the client to consider the advice and he can refer to it any time later as memories are short lived. Secondly, it is vital for the financial planner to prepare a written financial plan to save himself from any litigation against him by the client.

The essential components of a comprehensive financial plan are as follows.

Cover Page

BOX

CONFIDENTIAL
PERSONAL FINANCIAL PLAN
For----------
Mr. and Mrs.

Prepared By
Authorised Representative
XYZ Ltd
Date----------

1. Covering Letter

The written financial plan will start with a covering letter which will start by conveying thanks for seeking financial planning recommendations from the financial planning firm. It should state that the financial plan has been prepared as per the information provided by the client based on his current situation.

The financial planning firm has to mention that the current financial planning advice is developed on the basis of the objectives stated by the client and that these objectives have been accurately assessed by the financial planning firm, and recommendations have been prepared that will assist the client in accumulating financial assets to meet the various goals of life. There is also a need to explain to the client the time within which the plan has to be implemented and to emphasize on the need for review and revision of the plan.

2. Executive Summary

The executive summary will provide concise information about the key aspects of the client's financial situation followed by the recommendations and the potential outcomes of these recommendations. The summary should not be very

lengthy and should include everything that provides the client with information about the financial planning recommendations at a glance.

As the comprehensive financial plan is a lengthy document, which takes time to read and understand, a brief summary will provide all the relevant information.

3. Statement of the Current Situation

The next step in the written financial plan is to state the current financial situation, financial concerns and risk profile.

For example, Mr. X (client) you are XX years of age, employed in the private sector and getting the salary package of Rs. XXXX p.a. You contribute XX% of your salary towards provident fund and your present retirement fund corpus is Rs. XXXX.

You have a residential house worth Rs. XXXX and the outstanding loan amount is Rs. XX. Other than housing loan, you have no other liability. You have taken a mortgage redemption policy for the loan amount.

Your present investments are as follows.

	Rs.
Cash at bank	XXXX
Direct equity	XXXX
Diversified equity (mutual fund)	XXXX
Bank fixed deposits	XXXX
Life insurance	XXXX
Household policy	XXXX
Health insurance policy	XXXX
PPF	XXXX
NSC's	XXXX

This is a very important section as the financial planner will be making the recommendations on the basis of the current financial situation.

The financial planner must also add a statement at the end of this point which may read as follows:

"Please read the above information carefully and advise us immediately if we have misunderstood any point or there is any additional information to be given by you. We have prepared our recommendations on the basis of the above information".

4. Objectives

In this section of the written plan all the financial objectives of the client will be listed in the following manner:

- To provide for higher education of your children—estimated amount Rs. XXXX
- To provide a sum of Rs. XXXX after *n* number of years for your children's marriage
- To make available a retirement corpus of Rs. XXXX
- To protect your family through insurances
- To prepare a portfolio which is easy to manage
- To make a plan which is tax efficient
- To make a trip to Europe every year
- To leave an estate worth Rs. XXXX for your grandchildren

5. Assumptions

A financial plan has to address both the client's present situation and the expected or required future financial situation. In order to make a long term plan and to analyze potential future financial position, a financial planner has to make certain assumptions in the following areas:

- Inflation
- Salary/business income increase
- Returns on growth investments
- Returns on debt investments
- Return on balanced investments
- Taxation rates
- Life expectancy
- Increase/decrease in expenses

The basis of making assumptions should be mentioned in the form of a summary. The assumptions should be on the conservative side, for example, inflation rate assumed should be higher and return on investments should be assumed low.

6. Financial Planning Strategy

Financial plan implementation will enable a client to reach a preferred position in the future from the current position. The strategy used to take the client from the present to the future required position should be discussed in this section. The competent financial planner should be in a position to express both verbally and in written form the strategy to be followed in order to achieve the goals and objectives as and when these arise.

The priorities in an investment strategy are as follows.

(A) Risk Management This area will cover the financial risks which may arise in the life of the client.

These will include the need for life insurance, income protection cover, health insurance, insurance for major assets and investment risk.

Life insurance is required when there are dependants to look after. The amount should be adequate to provide for all the needs of dependants and to pay off loans, if any. Income protection is needed to give financial security to oneself and the family when the earning member falls sick. Income protection cover replaces up to 75% of the income of the person.

Health insurance is required by the person when reimbursement and hospitalization benefits provided by the employer are not sufficient and he wants to increase this amount, or when the person retires from the job.

Insurance of major assets is a must because of the increasing replacement cost. All investments carry some risk. This risk can be managed with proper diversification and by selecting those schemes which have the potential to give required returns.

(B) Asset Allocation Proper asset allocation is the basis of any investment plan. Asset allocation means allocating investments in different asset classes, i.e. fixed income, equity, money market, real estate, etc. As a rule of thumb, investment in debt funds should be equal to one's age and the remaining amount should be in equity.

For example, a 25 year old should invest 25% of the total amount available in debt instruments and remaining 75% in equity or equity-related instruments. As the age of a person increases, the proportion in debt should also increase and the investment in equity should reduce. Further, the asset allocation can be directed more towards debt or equity depending on the age, risk appetite and income level of the investor. Equity gives the portfolio growth and debt provides stability to it. Therefore, a proper asset mix is very essential while formulating the portfolio.

Assets should be properly diversified. Within each asset class funds should be spread further into good quality investments. Asset allocation is the basis of a sound long term portfolio. The asset allocation ratio should be maintained at the same level by re-balancing the portfolio at frequent intervals. Re-balancing will help in two ways—one, profits will be booked in rising markets and two, more investment will be done in equity in falling markets and at those levels when the market is in a bearish phase. Adequate amount should be kept in the form of liquid money to meet unexpected expenses.

In Fig. 1.1 Asset Allocation pattern of a person before he mets financial planner is given.

In Fig. 1.2 recommended asset allocation pattern suggested by a financial planner is given.

(C) Tax Efficiency Tax is a major expense which requires careful assessment and proper use of tax planning devices which will enable to save tax as well as help in accumulation of wealth.

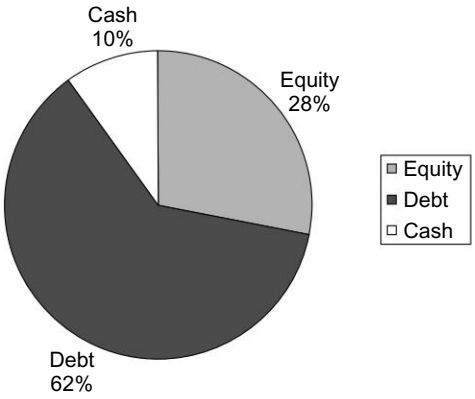

FIGURE 1.1 Present Asset Allocation

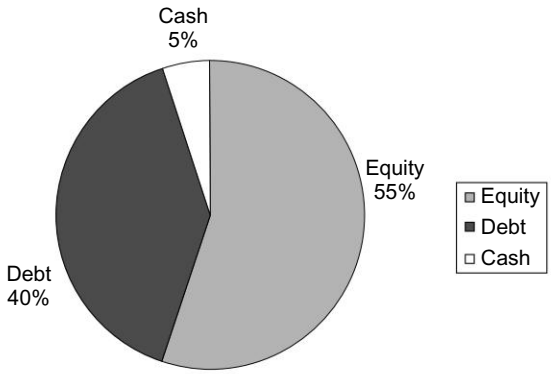

FIGURE 1.2 Recommended Asset Allocation

The areas that need attention are:

- Income tax
- Capital gains tax
- Superannuation tax
- Wealth tax
- Fringe benefit tax

As far as possible, non tax deductible debt should be replaced with tax deductible debt.

A financial planner has to ensure that he is in a position to improve the financial position of the client by putting all the strategies together. The proposed strategy should be made clear to him before presenting the recommendations.

(D) Estate Planning Estate planning means preparation of wills and power of attorney so that assets are distributed to the next generation without any

problem. The financial planner will also see to this aspect of the client's situation and advise the client about the importance of wills and power of attorney. A financial planner is not an expert in making a will or power of attorney, but the importance of these has to be discussed with the client as it is a part of the comprehensive financial planning process.

7. Summary of Recommendations

In this section all the recommendations made in the plan will be summarized. The recommendations should be in bullet points. These will be summarized in the following ways:

- We recommend that you increase your PF contribution by Rs. 3000 every month.
- We recommend that you withdraw from scheme XXXX, which is not performing well since the last 2 years and invest in scheme YYYY.
- We request you to increase your life insurance cover by Rs. 4,00,000.
- We recommend that you start investing through a Systematic Investment Plan, Rs. 5,000 every month for 5 years in the scheme AA of BBB Mutual Fund which will give you the benefit of rupee cost averaging and power of compounding.
- We feel that your emergency fund is not adequate and you should transfer Rs. 1,00,000 from your bank FD to your savings account or to the liquid fund scheme of a mutual fund.
- We recommend that you consult your solicitor for preparation of your will and powers of attorney.

After the presentation of summary of recommendations is complete and the client has understood and agreed to them, it is time to take action and proceed with implementing the recommendations.

8. Action to Proceed

In this section the financial planning firm/financial planner will write down the steps to be taken to proceed with the implementation of the plan. The planner/firm will request the client to sign a "Letter of Engagement", the format of which will be enclosed with the plan. This will be a formal letter to engage the firm as his financial planner.

The application forms for the recommended investments will be filled up and deposited along with cheques for the requisite amounts. The financial planning firm will help the client in filling up the forms. The completed forms will be submitted to the institutions. At the same time arrangements for ongoing service and review will be made. After around 3–4 weeks a further meeting will be scheduled to check with the client about receipt of all the certificates/account statements.

9. Disclosures

In this section disclosure about services and fee will be made. The fee for preparing the financial plan will be mentioned and any other form of commission to be received by the financial planning firm will be stated as follows.

Our fee for the preparation of this personal financial plan is Rs. XXXX.

Our fee for ongoing service and review will be Rs. XXXX.

We will also get brokerage from the financial institutions with which we will place your funds.

We will provide you timely advice on the performance of your portfolio.

We will do ongoing review and assessment of your portfolio. We will also see that the asset allocation is in line with the recommended allocation to enable you to achieve your goals and if need be revision in the portfolio will be done.

Any available information about new products will also be given to you on the regular basis.

Disclosures also include disclosure of investment risk. Whenever any investment is recommended, the investment risk involved in it should also be made clear to the client.

10. Disclaimers

Disclaimers means not to claim responsibility for the result of the financial plan because a financial planner may not be held liable for the events which are beyond his control and which have an adverse effect on the performance of the recommended schemes. For example, markets may move adversely and such economic events may occur which cannot be predicted even by research houses. However, the financial planner must not be negligent in giving advice.

These are a few examples of disclaimers:

- These recommendations are made for the benefit of only that person to whom this plan is addressed
- These recommendations are based on the information provided by you on your current situation; we hope this information is complete and accurate
- Returns on investments will depend on market conditions and the policy of fund management followed by fund managers
- Income and growth assumptions are on the basis of performance of the investment manager and economic conditions prevalent currently
- Assumptions regarding tax rates have been based on current rates and the area of taxation is subject to frequent changes
- The investments planned for you are long term in nature; therefore volatilities in short term should be ignored.

The most important structural requirement of a financial plan is that the client should understand the plan from the point of view of "the current situation, which will move to the desired future situation". The plan should be logical and written with clarity.

CHAPTER

2

Financial Mathematics – I

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- ❑ *Time value of money — The power of compounding*
- ❑ *Future value of one-time investment*
- ❑ *Use of Financial Calculator and Excel sheet*
- ❑ *Effective annual rate*
- ❑ *Present value of one-time investment*
- ❑ *Computation of implied return on investment*
- ❑ *Computation of number of periods in an investment*
- ❑ *Real rate of return*
- ❑ *Causes of interest rates*
- ❑ *Real versus nominal interest rate*
- ❑ *Return adjusted for tax*

Financial Mathematics

One of the most important skills a financial planner must have the ability to identify and compute the financial needs and goals of the client. This means that he should be in a position to convert the needs into financial terms and for this he should have a solid understanding of "financial mathematics", i.e. the understanding of "time value of money".

A very simple example of this is as follows. Suppose a client approaches a financial planner for making a retirement plan and indicates that he is 28 years

old and spends about Rs. 20,000 every month at present. He wishes to maintain the same standard of living even after retirement which will be at the age of 58. In this case, the financial planner has to see the working life time span and then convert the monthly expenses of Rs. 20,000 into future value, i.e. the money required per month the at age of 58. For this purpose he has to assume a reasonable rate of inflation for a 30-year period and increase the amount of Rs. 20,000. If the rate of inflation is assumed to be 5% this will work out to be Rs. 89,355.

2.1 TIME VALUE OF MONEY

Money has time value. A rupee today is more valuable than it will be a year hence or two years hence. This is because of the following factors.

- If a person is saving money, he is sacrificing his present needs for the future; therefore he should be compensated for this.
- In an inflationary period, money today represents more purchasing power than money tomorrow. In the example above, Rs. 20,000 per month, which is sufficient for a person to meet his living costs today is not sufficient after 30 years because of the effect of inflation. He needs Rs. 89,355 after 30 years to maintain the same standard of living if we assume the average rate of inflation to be 5% per annum.
- The person who will ultimately use the money saved will use it for productive purposes and therefore, the person who is sacrificing his present should be compensated in the form of returns.
- When a person is giving his money to be used by another person, he is also taking the risk associated with it, i.e. default risk and the need to compensate in the form of interest or return.

In order to compare two investment alternatives in which cash inflow is occurring at different intervals, there has to be a single tool for comparison, and that is present value or PV.

In this topic, various numericals with their calculations are given to enable one to become competent in solving problems on financial mathematics and ultimately in making an appropriate financial plan which will meet the financial needs of the clients as and when the time for this arises.

In order to do financial mathematics one needs to buy a financial calculator — either CASIO FC 100 or FC 200V, but these can also be done on an Excel sheet.

The various terms used in financial mathematics are:

PV	Present value
FV	Future value
Pmt	Payment/annuity/cash inflow/cash outflow
i	Interest rate/discount rate/required rate

N/Nper Number of periods

Bgn Beginning of the period

End End of the period

Type 1 for beginning of the period and 0 for end of the period (Excel)

While solving problems, use of a financial calculator and Excel has also been explained.

2.2 CALCULATION OF FUTURE VALUE FOR A ONE-TIME INVESTMENT I.E. A SINGLE INVESTMENT

We will start with calculation of the future value when a single investment is made. The mathematical formula to compute the future value is:

FV = PV (1+R) ^*n*

FV = Future value

PV = Present value

R = Rate of return

N = Number of periods

2.3 USE OF FINANCIAL CALCULATOR AND EXCEL SHEET

Q. An investor deposits into a bank Rs. 10,000 which pays 8% interest per annum compounded annually. How much money will he get after

(a) 10 years

(b) 12 years

(a) Solution: **With the help of Financial Calculator**

In FC–100 or FC–200 or FC–200 V

Go to CMPD (compounding) key and feed the values

To go to the next step, use the EXE key

Here PV (present value or one-time investment) is Rs. 10,000, *i* is 8% and *n* is 10 years

PV is always indicated as a minus

–10000 PV

8 *i*

10 *n*

Compute/solve FV = Rs. 21,589.25

Solution: **With the help of Excel sheet**

Go to fx, select category: Financial, select FV and then press ok

We will select FV because we have to compute or solve for future value

Rate: 8% or 0.08 and not simply 8

Nper: 10

Pmt: Blank

PV: –10000

Type: Blank (will be used while calculation of FV of annuity/ regular payment)

The answer will be shown as "formula result" i.e. Rs. 21,589.25

(b) Solution: With the help of Financial Calculator

Here PV is Rs. 10,000, i is 8% and n is 12 years

–10000 PV

8 i

12 n

Comp FV = Rs. 25,181.70

Solution: With the help of Excel sheet

Go to fx, select category: Financial, select FV and then press ok

Rate: 8% or 0.08

Nper: 12

Pmt: Blank

PV: –10000

Type: Blank

The answer is Rs. 25,181.70

Q. An investor deposits Rs. 50,000 in a security which is AAA rated. It pays 10% interest compounded semi-annually. How much money will be available on this after 8 years?

Solution: With the help of Financial Calculator

–50000 PV

5 i

16 n

Comp FV = Rs. 1,09,143.73

In this case the number of periods will become 16 in place of 8 because of semi-annual compounding and the rate of interest will become half as it is paying semi-annually.

Solution: With the help of Excel sheet

Rate 5% or 0.05

Nper 16

PV –50000

The answer is Rs. 1,09,143.73

Q. A person borrowed Rs. 1,00,000 at 8% per annum, compounded quarterly. What amount does he have to pay back after 5 years?

Solution: **With the help of a Financial Calculator**

– 100000 PV
2 *i*
20 *n*

Comp FV = Rs. 1,48,594.74

In this case, the rate of interest will be divided by 4 as it is quarterly compounding and the number of periods will be 5 × 4 = 20. The same data will be fed into an Excel sheet to compute future value. When one takes a loan, it will be assumed as PV and in this case one has to make a lump sum payment of the loan with interest at the end of the 5-year term.

Q. Saurabh invests Rs. 40,000 in a fixed deposit which pays him 8% interest per annum compounded monthly. How much will he get after 5 years?

Solution: **With the help of a Financial Calculator**

–40000 PV
0.6667 *i*
60 *n*

Comp FV = Rs. 59,593.83

The rate will be divided by 12 since it is monthly compounding and the period will be multiplied by 12 since this will be 60 months.

Solution: **With the help of Excel sheet**

Go to fx, select a category: Financial, select FV and then press ok
Rate 8%/12
Nper 5 × 12
PV –40000
Formula result = Rs. 59,593.83

We have learnt one thing here and that is, the higher the compounding, the more the amount of future value. If we take one notional amount and do the compounding annually, semi-annually, quarterly and monthly, we will find that the monthly compounding will pay more future value and therefore the effective interest rate will be more than the nominal rate.

Let us take one notional amount of Rs. 50,000 and at the same rate of 12% do monthly, quarterly, semi-annual and annual compounding. The investment horizon is one year.

Monthly compounding

– 50000 PV
1 *i*

12 *n*

Comp FV = Rs. 56,341.25

Quarterly compounding

– 50000 PV

3 *i*

4 *n*

Comp FV = Rs. 56,275.44

Semi-annual compounding

– 50000 PV

6 *i*

2 *n*

Comp FV = Rs. 56,180

Annual compounding

– 50000 PV

12 *i*

1 *n*

Comp FV = Rs. 56,000

In the case of monthly compounding, the amount of future value is higher than in the others. We can say that the effective rate of return is more in the case of monthly compounding than in semi-annual, quarterly and annual compounding.

2.4 HOW TO CALCULATE EFFECTIVE ANNUAL INTEREST RATE?

The formula for converting the nominal rate of interest into an effective annual interest rate is as follows:

$$\text{Effective annual rate} = \{(1+i)\ \hat{}\ m - 1\} \times 100$$

i = Nominal rate of return

m = Number of compounding in a year

Rate (i) here will be the monthly rate if compounding is monthly, quarterly if compounding is quarterly, semi-annual rate if it is half yearly and annual rate if the compounding is annual.

To calculate effective rate in FC-200 V calculator

Press (CNVR) key

N = 1, 2, 4 or 12 for annual, semi-annual, quarterly and monthly compounding respectively.

1% will always be equal to the nominal rate.

In the following calculations we have calculated the effective annual rate taking the above question as the base.

1 Monthly compounding

$= \{(1+1\%)\ ^12 - 1)\} \times 100$

$= \{(1.01)\ ^12 - 1)\} \times 100$

$= 12.6825\%$

2 Quarterly compounding

$= \{(1.03)\ ^4 - 1\} \times 100$

$=12.5508\%$

3 Semi-annual compounding

$= \{(1.06)\ ^2 - 1\} \times 100$

$=12.36\%$

4 Annual compounding

$= \{(1.12)\ ^1 - 1\} \times 100$

$=12\%$

If we invest money and we get for example, monthly compounding on our investment, we will get more accumulated money (FV); but if we borrow money and again the compounding is monthly, we will have to pay more money in the form of interest because in both cases the effective annual rate is high.

Q. If a person takes a loan of Rs. 2,00,000 at 9% per annum nominal interest, what would be the interest paid at the end of the year if compounding is

(a) Annual
(b) Semi-annual
(c) Quarterly
(d) Monthly

Solution: **Annual**

–200000 PV
9 *i*
1 *n*

Comp FV = Rs. 2,18,000

Interest amount will be Rs. 2,18,000 – Rs. 2,00,000 = Rs. 18,000

Semi-annual

–200000 PV
4.5 *i*
2 *n*

Comp FV = Rs. 2,18,405

Interest amount will be Rs. 2,18,405 – Rs. 2,00,000 = Rs. 18,405

Quarterly compounding

–200000 PV

2.25 *i*

4 *n*

Comp FV = Rs. 2,18,616.66

Amount of interest will be Rs. 2,18,616.66 – Rs. 2,00,000 = Rs. 18,616.66

Monthly compounding

–200000 PV

0.75 *i*

12 *n*

Comp FV = Rs. 2,18,761.38

Interest amount will be Rs. 2,18,761.38 – Rs. 2,00,000 = Rs. 18,761.38

We see that the interest amount is more in case of monthly compounding than in quarterly, semi-annual and annual compounding.

2.5 PRESENT VALUE OF ONE-TIME INVESTMENT

How does one compute the present value of a one-time investment to be made when we know the future value? When we know the amount that is required after a certain period and we have to make a one-time investment to reach the target we will calculate the present value (PV). In this case, we know the future value (FV) and we know the time horizon and rate of interest. We will understand this with the help of an example.

The formula to calculate PV when FV is given will be as follows:

$$PV = FV/(1+R)\ ^{\wedge}n$$

To do this with the help of Financial Calculator

———— FV

———— *n*

———— *i*

Comp PV

To do this in Excel, the steps to be followed will be:

Go to fx, select a category: Financial, select PV and press ok.

Rate = % or 0.00

Nper = Number of periods

FV = Rs. 00,000

Formula result will be the PV

Let us do this with examples.

Example: What amount should be invested now for it to become Rs. 85,000 in 5 years when the rate of return is 9% per annum and compounding is done once a year?

Formula

PV = FV/(1 + R)^N
= 85000/(1.09)^5
= Rs. 55,244.17

With the help of Financial Calculator

85000 FV
5 *n*
9 *i*
Comp PV = Rs. –55,244.30

With the help of Excel

Go to fx, select the category: Financial, select PV and feed the values
Rate = 9% or 0.09
Nper = 5
FV = Rs. 85,000
Formula result is Rs. –55,244.17

Example: What amount would Mr. Ashok need to invest in order to get Rs. 5,00,000 after 6 years? He is a moderate risk taker and likes his investment to be made in a balanced fund where the return can be estimated at 12% to be on the conservative side.

500000 FV
6 *n*
12 *i*
Comp PV = Rs. –2,53,315.56

Example: What should be preferred:

(a) Rs. 1,00,000 today
(b) Rs. 1,40,000 2 years later
(c) Rs. 1,60,000 3 years later

when the rate of interest is 8% per annum and compounding is done annually?

In this case, we have to compute the present value of all the three options.
In option (a) PV is Rs. 1,00,000
(b) FV Rs. 1,40,000, 2 *n*, 8 *i* Comp PV = Rs. 1,20,027.44
(c) FV Rs. 1,60,000, 3 *n*, 8 *I* Comp PV = Rs. 1,27,013.16

Option number (c) is better because the PV of Rs. 1,60,000 which will be received after 3 years is high as compared to options (a) and (b).

In this case, we can solve this question with the help of the FV function also. If we wish to do it with FV:

We will invest Rs. 1,00,000 for 3 years @ 8% p.a. and invest Rs. 1,40,000 for one year @ 8% p.a. and then compare with the Rs. 1,60,000 which is going to be received after 3 years.

(a) FV of Rs. 1,00,000 @ 8% for 3 years = Rs1,25,971.20

(b) FV of Rs. 1,40,000 @ 8% for 1 year = Rs. 1,51,200.00

Again, option (c) is the better of the three options. Whenever one compares two investments, these have to be brought to the same level, i.e. either PV or FV.

Example: What amount would need to be invested to grow to Rs. 50,000 in 8 years if compounding is done semi-annually as is done in RBI taxable bonds, if the rate of interest was 11% p.a.?

50000 FV

16 *n*

5.5 *i*

Comp PV = Rs. –21,229.05

In this case, number will be 8 years × 2 because of semi-annual compounding and the rate will be 11/2 = 5.5% per semi-annual.

Example: How much should be invested for 5 years at 12% rate of return to become Rs. 45,000 when compounding is done quarterly?

45000 FV

20 *n*

3 *i*

Comp PV = Rs. 24,915.41

In this case, compounding is quarterly, therefore *n* will be multiplied by 4 and the rate of interest will be divided by 4.

Example: What should be invested now to grow to Rs. 2,50,000 in 12 years time at 9% p.a. rate of interest when compounding is done monthly?

250000 FV

144 *n*

0.75 *i*

Comp PV = Rs. –85,241.70

The number of years will be multiplied by 12 and the rate of interest will be divided by 12 since compounding is done monthly.

We have so far learnt about calculation of the future value (FV) that is, the accumulated amount. We have also learnt how to compute the present value (PV) or the initial one-time investment to be made when we know how much should be the accumulated amount after a certain period.

2.6 COMPUTATION OF IMPLIED RETURN ON INVESTMENT

How does one compute *i* (rate of return) implied into an investment, when a certain lump sum amount invested for a certain period grows to a certain amount?

This means that we know the present value (PV), the future value (FV) and the number of periods (*n*) and we have to compute the implied rate or *i*.

With the help of a Financial Calculator

———— FV

———— PV

———— *n*

Compute *i*

With the help of Excel

Go to fx, select the category: Financial, select the rate and feed the values like this:

Nper *n*

PV Amount

FV Amount

Formula result is *i*, that is, the implied rate of return.

Example: Anita invests Rs. 2,00,000 in a diversified equity fund of a mutual fund and it becomes Rs. 8,00,000 in 10 years when compounding is done annually. Compute the implied rate of return on this investment.

–200000 PV

800000 FV

10 *n*

Compute *i* = 14.87%

With the help of Excel

Go to fx, select the category: Financial, select rate and press enter and feed the data as under:

Nper 10

PV –200000

FV 800000

Formula result = 14.869 or 14.87%

Example: Richa invests Rs. 55,000 into a bank fixed deposit which pays semi-annual interest. Richa has given the option of reinvestment. After 5 years the amount becomes Rs. 85,413.31.

Calculate the annual rate of interest given by the bank?

With the help of a Financial Calculator

–55000 PV

85413.31 FV

10 *n*

Comp I = 4.49 or 4.5%

Annual rate will be 9%

This *i* will be a semi-annual rate; it will be multiplied by 2 to arrive at the annualized rate.

Example: Rs. 1,50,000 becomes Rs. 2,34,500 in 2.5 years when compounding is done quarterly. Compute the quarterly rate of interest and the nominal rate.

–150000 PV

234500 FV

10 *n*

Comp *i* = 4.569% (quarterly rate)

Annual rate = 4.5695 × 4 =18.2781%

With the help of Excel

Nper 10

PV –150000

FV 234500

Formula result = 4.569% quarterly

Annual rate = 4.5695 × 4 = 18.2781%

Example: Soma invested Rs. 65,000 in a fund in which compounding is done monthly. The amount becomes Rs. 1,00,000 in 2 years. Compute the monthly rate of interest and the nominal rate.

With the help of a Financial Calculator

–65000 PV

100000 FV

24 *n*

Comp *i* = 1.811 monthly rate

Nominal rate = 1.811 × 12 = 21.73%

With the help of Excel

Go to fx, select the category: Financial, select rate and press ok.

Nper 2 ×12

PV –65000

FV 100000

Formula result = 1.811 (monthly rate)

To convert into annual rate multiply this rate by 12 and it will be 1.811 × 12 = 21.73%

2.7 COMPUTATION OF THE NUMBER OF PERIODS IN AN INVESTMENT

How does one calculate *n* (number of periods) for an investment when an amount of PV grows at a certain rate and it becomes a future value (FV), and we have to find the number of periods, i.e. number of years, semi-annuals, quarters or the number of months? We will learn how to compute *n* with the help of a financial calculator and with the help of Excel.

With the help of Financial Calculator

Go to CMPD and feed the values

———————— PV

———————— FV

—-————- *i*

Compute *n*

With the help of Excel

Go to fx, select category: Financial, select Nper and feed the values

Rate —% or 0.00

PV ————————

FV ————————

The formula result is the answer.

Example: How many years will it take for Rs. 50,000 to double when the rate of interest is 12% p.a. and compounding is done annually?

With the help of a Financial Calculator

–50000 PV

100000 FV

12 *i*

Comp *n* = 6.11 years

With the help of Excel

Go to fx select the category financial select Nper and press enter

Rate 12% or 0.12
PV –50000
FV 100000
Formula result = 6.11 years

Example: Mr. Sagar wishes to deposit Rs. 2,50,000 in RBI bonds which give a return of 8% p.a. Compounding is done semi-annually. It becomes Rs. 3,70,061.07. How many semi-annuals and how many years does it take?

With the help of Financial Calculator

–250000 PV
370061.07 FV
4 *i*
Comp *n* = 10 (semi-annuals) or 5 years

With the help of Excel

Go to Nper

Rate 4% or 0.04
PV –250000
FV 370061.07
Formula result = 9.9999 or 10 semi-annuals or 5 years

Example: In how many quarters will Rs. 12,000 become Rs. 18,000 when the rate of interest is 6% p.a. and compounding is done quarterly?

With the help of Financial Calculator

–12000 PV
18000 FV
1.5 *i*
Comp *n* = 27.23 quarters or 6.81 years

With the help of Excel

Go to Nper

Rate 6%/4
PV –12000
FV 18000
Formula result = 27.23 quarters or 6.81 years

Example: Rupees 1,50,000 is invested in an instrument which gives 12% rate of interest and compounding is done monthly. How many months will it take for it to become Rs. 2,72,504.50?

With the help of Financial Calculator

–150000 PV
272504.50 FV
1 *i*
Comp *n* = 60 months or 5 years

With the help of Excel

Go to Nper
Rate 12%/12
PV –150000
FV 272504.50
Formula result = 59.999 or 60 months

We have so far learnt how to compute the future value, present value, interest rate and number of periods when there is a one-time investment (PV).

In the following paragraphs, a few practice questions are given along with hints for calculation.

1. Mr. Saha, who has been working with a multinational company for the last 15 years, is 45 years old and spends Rs. 5,40,000 annually to maintain his living standard. He wants to maintain the same standard of living even after retirement. Inflation is @ 5% for the whole 15 year period and even though there will be an increase in the price of goods and services he would not like to compromise on his living standard. What amount will be required annually when he retires at age 60?

Solution: In this case, he is spending Rs. 5,40,000 p.a. which will increase every year with the rate of inflation which is assumed to be constant at the rate of 5% p.a. for the whole 15 years.

–540000 PV
5 *i*
15 *n*
Comp FV = Rs. 11,22,621.21

This means that to maintain the same standard he requires Rs. 11,22,621.21.

2. Miss Monica spends Rs. 2,40,000 p.a. and she wishes to increase her living standard by 3% every year as she is optimistic about the growth in her career. She is 30 years old and inflation is assumed to be 4.5% for a 30 year period. How much money per annum will she require at age 60?

Solution: In this case, the requirement will increase every year with the rate of inflation as well as increase in standard of living, i.e. (4.5% + 3%) = 7.5%

–240000 PV
7.5 *i*
30 *n*
Comp FV = Rs. 21,01,189.25

She needs Rs. 21.01 lakh at the age of 60. If she feels that she can save this much money that will enable her to be comfortable every year for the rest of her life after retirement then she is absolutely safe, otherwise she may have to either cut down on her standard of living or save more in order to meet her goal.

3. Mr. Rajan spends Rs. 3,60,000 per annum to meet his annual living costs. He wishes to maintain the same standard of living after retirement which will be after 15 years. Inflation in the first 5 years is 5% p.a. and in the next 5 years it will be 4.5% while in the following 5 years it will be 5.5% p.a. Mr. Rajan feels that at the age of 60 most of his commitments such as children's education and marriage will be fulfilled and therefore he requires only 75% of the expenses from age 60 onwards. How much money will Mr. Rajan require at the age of 60?

Solution: In this case, we will first have to find out the amount of the expenses he will have at age 60 and then compute 75% of the last amount.

In the 1st phase of 5 years:
–360000 PV
5 *i*
5 *n*
Comp FV = Rs. 4,59,461.36

In the 2nd phase of 5 years:
–459461.36 PV
4.5 *i*
5 *n*
Comp FV = Rs. 5,72,572.45

In the 3rd phase of 5 years:
–572572.45 PV
5.5 *i*
5 *n*
Comp FV = Rs. 7,48,329.29

He needs 75% of expenses at age 60.
75% of Rs. 7,48,329.29 = Rs. 5,61,246.97

4. Sudha needs Rs. 5,25,000 after 5 years and Rs. 10,00,000 after 12 years to meet two goals of buying a car and a house. The rest of the money required to buy a house will be financed by her employer. She has a long term horizon and

can therefore invest in equity which will provide her a 15% return on her investments. What is the lump sum amount she should invest now in order to meet her two goals at the appropriate time?

Solution: 1st goal of Rs. 5,25,000

525000 FV
15 *i*
5 *n*
Comp PV = –261017.79

2nd goal of Rs. 10,00,000
1000000 FV
15 *i*
12 *n*
Comp PV = –186907.15

Sudha will have to invest Rs. 2,61,017.78 + Rs. 1,86,907.15 = Rs. 4,47,924.94

5. Sneha gets a bonus from her employer every year in the month of April. She invests this money in equity mutual fund schemes. She has already accumulated Rs. 11,00,000 and the average rate of return on these investments have been 15% p.a. This year she invested Rs. 2,00,000 in the same type of schemes which pay her 15% rate of return. Next year she will invest Rs. 3,00,000. How much money will she have in her account after 10 years if she does not invest after that?

Solution:

Step 1

Rs. 11,00,000 accumulated will grow for 10 years @15% p.a.

–1100000 PV
15 *i*
10 *n*
Comp FV = Rs. 44,50,113.51 (1)

Step 2

Rs. 2,00,000 invested this year will grow for 10 years @15% p.a.

–200000 PV
15 *i*
10 *n*
Comp FV = Rs. 8,09,111.55 (2)

Step 3

Rs. 3,00,000 will grow for 9 years @15% p.a.

–300000 PV
9 *n*
15 *i*
Comp FV = Rs. 10,55,362.89 (3)

Total accumulated amount = Rs. 44,50,113.51 + Rs. 8,09,111.55
+ Rs. 10,55,362.89
= Rs. 63,14,587.95

6. Raman invested Rs. 4,10,000 for 8 years @ 7% p.a. where it was compounded annually for the first 5 years and quarterly for the last three years. What did he get on maturity?

Solution: This question will be divided into two parts since compounding is different in the two phases.

Step 1

Rs. 4,10,000 will grow for the first 5 years with annual compounding:

–410000 PV
5 *n*
7 *i*
Comp FV = Rs. 5,75,046.21

Step 2

Rs. 5,75,046.21 will grow for the next three years with quarterly compounding:

–575046.21 PV
1.75 *i*
12 *n*
Comp FV = Rs. 7,08,134.51

7. How many years will it take for Rs. 2,00,000 to become Rs. 3,50,000 when the interest rate is 9% and compounding is done annually?

Solution: In this question we have to determine the period in which the amount will become Rs. 3,50,000.

–200000 PV
350000 FV
9 *i*
Comp *n* = 6.49 years

8. Mr. Hari wishes to have Rs. 5,75,000 after 10 years for his son's higher education. The prevailing rate of interest is 12% p.a. He has Rs. 2,00,000 in his

savings bank account. Is it possible to achieve his goal of accumulating the required amount after 10 years with this amount? If yes, then calculate the amount of investment required?

Solution: In this case we have to find the amount that should be invested by him today in order to achieve his goal?

575000 FV
12 *i*
10 *n*
Comp PV = Rs. –1,85,134.61

Yes, he can meet his goal of providing Rs. 5,75,000 after 10 years. His savings account has sufficient balance to meet this investment.

9. Gautam has Rs. 3,00,000 to invest and he wishes to make this money grow to Rs. 6,03,407.15 in 5 years. He has the following options available to him and he is a moderate risk taker.

BOX

Name of instrument	*Return p.a.*
RBI (taxable) bonds	8%
Debt funds of mutual funds	9%
Balanced funds	12%
Diversified equity funds	15%
Direct equity	18%

Which instrument should he choose to meet his target of accumulating Rs. 6.034 lakh?

Solution: In this case, we have to compute (i) and accordingly select the instrument for investment.

–300000 PV
603407.15 FV
5 *n*
Comp *i* = 15

Since the required amount matches with the 15% return, he should select diversified equity funds for investment.

10. If Rs. 5,000 is invested and grows to Rs. 24,000 in 36 monthly compounding, calculate the monthly rate of interest and annualized rate of return?

–15000	PV
24000	FV
36	*n*

Comp i = 1.314 (monthly) × 12 = 15.77%

So far, we have learnt about the accumulation of money when investment is a one-time or single investment. We will now discuss annuities. Normally, a person invests regularly after meeting monthly household expenses. We will also learn about computation of EMI on a housing loan.

Calculations have been explained with the help of Excel and Financial Calculator.

2.8 REAL RATE OF RETURN

What is Real Rate of Return?

How much did our investments really earn last year? We can calculate a rate of return, but if we do not adjust it for inflation, we are not getting the real rate of return as the cost of goods and services is also increasing. The real worth of the accumulated value will be known only when we adjust it for inflation.

This is the difference between the nominal interest rate and the real interest rate. The real rate is the only number that means anything.

Think of it this way: the nominal interest rate tells you the growth rate of your money, while the real interest rate tells you how much your purchasing power is growing.

For example, if someone makes an investment of Rs. 10,000 that earns 8% in one year, he ends the year with Rs. 10,800. In other words, the money has grown by Rs. 800.

However if inflation is 3% for the year, the Rs. 10,800 is only worth Rs. 10,485. Inflation devalues not only the interest that is earned but the principal too. The real rate of return is only 4.85%.

Investors who depend on dividend income or interest from bonds or other fixed-income securities are most directly affected by the cost of inflation. If someone holds a stock, the gains build up until he sells, so it may be possible to avoid the "inflation tax" if he can time the sale for periods of low inflation.

Stocks can generally weather the effects of inflation better than bonds or other savings instruments. Companies can pass on the higher cost of inflation to customers. Of course, this tends to keep the inflationary cycle going.

Before we distinguish between the nominal rate and the real rate of interest in order to be clearer about the concept, let us first understand why there should be an interest rate?

An interest rate is the price a borrower pays for the use of money he does not own or which is borrowed by him, and the return a lender receives for

deferring his consumption by lending to the borrower. Interest rates are expressed as a percentage over a period of one year.

Interest rates are also a vital tool of monetary policy and are used by RBI to control variables like money supply, inflation and unemployment.

2.9 CAUSES OF INTEREST RATES

- Deferred consumption—When money is lent, the lender delays spending the money on present consumption goods. According to time preference theory, people prefer goods now to goods later and hence the need for a positive interest rate.
- Inflationary expectations—All economies suffer from inflation. This means that a given amount of money will buy fewer goods in the future than it buys now. The borrower needs to compensate the lender for this.
- Alternative investments—The lender has a choice between using his money in different investments. If he chooses one, he forgoes the returns from all the others. Different investments effectively compete for funds.
- Risks of investment—There is always a risk that the borrower will go bankrupt or otherwise default on the loan. This means that a lender generally charges a risk premium to ensure that, across his investments he is compensated for those that fail.
- Liquidity preference—People prefer to have their resources available in a form that can immediately be exchanged rather than in a form that takes time or money to realize.
- Taxes—As some of the gains from the interest earned may be subject to taxes, the lender may wish to get a higher rate to make up for this loss.

2.10 REAL VS NOMINAL INTEREST RATES

The nominal interest rate is the amount, in money terms, of interest payable.

For example, suppose a household deposits Rs. 100 with a bank for 1 year and they receive interest of Rs. 10. At the end of the year their balance is Rs. 110. In this case, the nominal interest rate is 10% per annum.

The real interest rate, which measures the purchasing power of interest receipts, is calculated by adjusting the nominal rate charged to take inflation into account.

Suppose the rate of inflation in the economy is 5% p.a. then the real rate of return will be 4.76%.

The formula to calculate the real rate of return is:

$$R = [\{(1 + r)/(1 + e)\} - 1] \times 100$$

$$R = (1.10/1.05) - 1 \times 100 = 4.76\% \text{ p.a.}$$

2.11 RETURN ADJUSTED FOR TAX

While advising clients to make a particular investment, we have to consider the effect of tax on that investment. For example, an investment on which the interest is added to the income for tax purposes and is subject to normal tax rates will give less tax adjusted return than an investment on which the interest is free from tax.

Return on a taxable instrument:

Return adjusted for tax = Rate (1– tax rate)

For example an investment providing an annual return of 8% and interest income that is subject to normal tax rate of 30% + 3% education cess (30.90%), will give a tax adjusted return of:

= 8 (1 –.3090)

= 8 (.6910)

= 5.528%

If inflation is 5%, real rate is almost negligible. We have to consider the impact of inflation and tax while recommending investments to clients. There are investment avenues available in the Indian market, which give tax free returns.

CHAPTER

3

Financial Mathematics – II

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- ❑ *Holding Period Return (HPR) and Compounded Annual Growth Rate (CAGR)*
- ❑ *What is annuity?*
- ❑ *Types of annuities*
- ❑ *Future value of an annuity*
- ❑ *Use of Financial Calculator and Excel*
- ❑ *How to compute required monthly/annual saving (Pmt)?*
- ❑ *Present value of an annuity*
- ❑ *Computation of rate and number of periods*
- ❑ *Deferred annuity*
- ❑ *Annuity in perpetuity*
- ❑ *Growing annuity*
- ❑ *Net present value and IRR*

3.1 HOLDING PERIOD RETURN

Holding period return is the total return received from holding an asset. It is calculated as income plus price appreciation during a specified time period, divided by the cost of investment. When we are looking at the return that we earn on our investments, one of the first measures that we will look at is the holding period return. This return includes income from all sources—dividends, interest and the change in the price of the asset.

The formula for calculating the holding period return is:

HPR = C+ (Sale price – purchase price)/purchase price

This can be well understood with an example.

Suppose a person invested Rs. 1, 00,000 in a scheme which paid him the following dividends in 3 years:

1st year Rs. 12,000

2nd year Rs. 12,500

3rd year Rs. 11,500

4th year Rs. 12,100

At the end of four years the value of his investment is Rs. 1,31,900. Calculate the holding period return. In this case we will calculate HPR in this way:

R = 12000 + 12500 + 11500 + 12100 (131900 – 100000)/100000

= 80%

This return is for four years and is called holding period return. When we talk of return, it is annualized return or in other words compounded annual growth rate (CAGR).

CAGR (Compounded Annual Growth Rate)

CAGR is the year-over-year growth rate of an investment over a specified period of time. In the above example where 80% is the return in four years, the annual growth rate will not be 80/4 = 20% but will be less than this figure as growth is compounded.

The compound annual growth rate is calculated by taking the n^{th} root of the total percentage growth rate, where n is the number of years in the period being considered.

This can be written as follows:

$$CAGR = [\{(1+r) \text{ ^ } 1/n\} - 1] \times 100$$

In this example we can calculate CAGR in two ways: one is to do with the formula and the other is to do with the help of financial mathematics.

With formula

R = {(1+80%) ¼ – 1} × 100

R = {(1.80)¼ – 1} × 100

= (1.80) ^.25) – 1 × 100

= 15.83%

With the help of financial mathematics

Assume a notional amount of investment, say Rs. 10,000, and you know that in 4 years the return is 80%. Thus, the amount will become Rs. 18,000 in four years. You have to calculate the annualized return.

–10000 PV
18000 FV
4 *n*
Compute *I* = 15.83%

- In case the holding period of investment is one year, the CAGR will be equal to the HPR
- In case the holding period is more than one year, the CAGR will be less than the HPR

Understanding the use of financial mathematics for calculating CAGR is very important for a financial planner as it helps to calculate returns which will enhance the convincing capabilities. The same can also be done with the use of an Excel sheet, by selecting the rate in financial functions and feeding the required values. This has already been explained earlier.

3.2 WHAT IS ANNUITY?

An annuity is a series of payments of the same amount at regular intervals, over a specified period of time. The word annuity has been used to describe monthly, quarterly, semi-annual and annual payments which are of equal amounts. Some examples of annuity are:

- Salaries of employees
- Deduction of tax from salaries
- Payment of EMI on a housing loan
- Interest from Government of India bonds (semi-annual)
- Quarterly interest from Senior Citizen Saving Scheme
- Rent or lease amount on a house
- Monthly interest from PO MIS scheme
- Payments towards Systematic Investment Plans (SIP)
- Regular withdrawal through Systematic Withdrawal Plans (SWP)
- Transfer of amount to scheme through Systematic Transfer Plan (STP)
- Payment towards society maintenance charges

3.3 TYPES OF ANNUITIES

1. Ordinary Annuity or Investment/Payment at the End of the Period

Suppose a person invests a certain amount of money at the end of every month after meeting all the monthly expenses. If the 1st installment is at the end of January (31st January), he will lose the benefit of interest for the month of January and will start getting interest on his investment from 1st February

onwards. This is called ordinary annuity. In other words, if a person pays the installment of a loan amount at the end of every month, he will have to pay more because the lender will charge him a higher EMI as he will lose one month's interest on this amount. The same is true about quarterly, semi-annual or annual payments.

2. Annuity due or Investment/Payment at the Beginning of the Period

Suppose a person has made a budget of his monthly expenses and he invests a certain amount at the beginning of every month. If the 1st installment is paid at the beginning of January (1st January), he will start getting interest from this date itself, instead of from 1st February as in the previous example. He will get one month's extra interest. The same is true for quarterly, semi-annual and annual investments. If we see the other side, i.e. if we make the payment of loan amount at the beginning of the period, we will have to pay a lesser EMI than if we pay at the end of the month.

3. Deferred Annuity

Suppose a person aged 40 has invested a lump sum amount today and after 20 years when he retires, he will start getting a certain amount every month in the form of pension; this is a case of deferred annuity as the payment of regular pension has been deferred for 20 years. The amount invested will earn interest for 20 years and after that it will start paying a monthly annuity in the form of a pension. Here again, payment of annuity can be at the beginning of the period or at the end of the period.

4. Annuity in Perpetuity

Suppose a person wishes that the payment of annuity should continue forever: he should invest a sufficient amount of money so that the interest income from this is enough to pay the amount of annuity. This is called annuity in perpetuity. If a person wishes to have an annual annuity of Rs. 1,20,000 and the rate of interest is 10% p.a., he should invest Rs. 12,00,000 so that he will continue to get Rs. 1,20,000 every year. To compute annuity in perpetuity, the required amount of annuity will be divided by the rate of interest. In this case it will be: 120000/0.10 = Rs. 12,00,000

5. Growing Annuity

An annuity is a series of payments of the same amount at regular intervals over a specified period of time. Growing annuity means that the amount of annual investment will keep increasing. Every individual gets an increase in his income/salary each year and if he saves a percentage of this every year then his annual investment will also increase.

We can calculate the future value of a growing annuity either with the help of a formula or with the help of an Excel sheet.

FV of a growing annuity = Pmt $\{(1+i)\ \hat{}\ n - (1+g)\ \hat{}\ n\}/\{(1+i) - (1+g)\}$

Here:

Pmt = 1st installment

i = Rate of return on investments

g = Growth rate of income

n = Number of years of investment

3.4 FUTURE VALUE OF AN ANNUITY

How to Compute Future Value (FV)?

Future value is the accumulated amount which a person will get after a certain number of years. While calculating the amount required for every goal, we take the required amount as the future value and calculate the amount to be saved every month/quarter/half-yearly or annually.

3.5 USE OF FINANCIAL CALCULATOR AND EXCEL

Q. Rakesh invests Rs. 20,000 every year at the end of every year at the rate of 12% p.a. How much money will be accumulated in his account after 10 years?

With the help of Financial Calculator

–20000 pmt

12 i

10 n

Comp FV = 350974.70

Always remember one important point: before PV we have to always put – (minus) sign and before pmt – (minus) will be put if we are investing and if we are receiving regular payments, we do not have to put a – (minus) sign.

With the help of Excel

Go to fx select the category: financial and select FV and feed the values

Type 1 for beginning of the period and 0 for the end of the period

Rate 12% or 0.12

Nper 10

Pmt –20000

Type 0

Formula result = 350974.70

That is future value or the accumulated amount.

Q. In the previous question, if Rakesh decides to invest Rs. 20,000 at the beginning of every year for 10 years @12% per annum, how much will be accumulated in his account?

With the help of Financial Calculator

–20000 pmt
Bgn
12 *i*
10 *n*
Comp FV = 393091.66

In some financial calculators, 0 or 1 will be put for end and beginning.

With the help of Excel

Go to fx select the category: financial, select FV and press OK

Rate 12% or 0.12
Nper 10
Pmt –20000
Type 1
Formula result = FV = 393091.66

Q. Rahul is 20 years old and has just joined a bank as relationship manager. He happened to meet a certified financial planner who advised him to start investing systematically and explained to him the power of compounding. Rahul was impressed with the advice given and started saving Rs. 1,800 every month at the beginning of the month. The rate of return expected on his investment is 15% p.a. How much will be accumulated in his account after 40 years?

–1800 pmt
Bgn
480 *n*
1.25 *i*
Comp FV = 56526759.82. (5.65 Cr)

Just observe the power of compounding; a small amount of regular savings has created wealth of Rs. 5.65 crore.

3.6 HOW TO COMPUTE REQUIRED MONTHLY/ANNUAL SAVING (PMT)

When we know our financial goal of accumulating a certain amount during a certain period, we have to compute Pmt, i.e. the amount of regular savings to be made to reach that goal.

To calculate with a financial calculator, the following steps are required:

———— FV

———— *n*

———— *i*

Comp Pmt

If saving is to be done at the beginning of the period then press Bgn and then calculate the amount of regular saving (annuity).

In Excel, go to fx, select the category: Financial, select PMT and feed the values as follows:

Rate —%

Nper ——

FV ——

Type 0 or 1(1 for beg and 0 for end)

Q. Shashi needs Rs. 12,00,000 for her daughter's marriage which will take place after 12 years. She wishes to save money at the end of every month in a systematic investment plan which will generate 14% return per annum. What amount should she save every month to meet this goal after 12 years?

In Financial Calculator

1200000 FV

1.167 *i*

144 *n*

Compute Pmt = –3245.52

When saving is monthly, the rate will be divided by 12 and the number of years will be multiplied by 12 to convert it into months.

In Excel

Rate 14%/12

Nper 12 × 12

FV 1200000

Type 0

Formula Result = –3245.52

Q. Richa is 14 years old and she is very intelligent and good in studies. She plans to pursue an engineering degree course from Australia. For this the amount required is Rs. 8,00,000 in today's terms which will increase @ 6% p.a. and the amount is required after 5 years. How much per quarter should her father start saving from now on if the rate of return on investment is expected to be 9% p.a.?

In this case, we first have to find the amount required by Richa after 5 years and then determine the amount of quarterly savings required by her father.

Step 1

–800000 PV

6 *i*

5 *n*

Comp FV =1070580.46

Step 2

We have to compute quarterly PMT required to be saved for 20 quarters @ 2.25% per quarter.

1070580.46 FV

20 *n*

2.25 *i*

Comp Pmt = 42975.31

He will have to save Rs. 42,975 every quarter to make it Rs. 10,70,580 after 5 years which is required by Richa to pursue her degree course.

Q. Vishal has taken a loan of Rs. 25,00,000 from his employer for purchase of a flat @ 10% p.a. for a period of 20 years. Compute the amount of Equated Monthly Installment (EMI) amount?

Solution: Loan amount is always assumed to be PV and a – sign will always be put before PV.

–25,00,000 PV

240 *n*

0.833 *i*

Comp Pmt = 24125.54

3.7 HOW TO COMPUTE PRESENT VALUE OF AN ANNUITY?

Q. Mr. Prashant is thinking of buying a residential house partly with the help of a loan amount and partly with his own savings. He has 20 lakh of financial assets out of which some assets may be sold off to pay the upfront amount. He can pay maximum EMI of Rs. 12,000 p.m. He has identified a house for Rs. 25 lakh. He is 33 years old and the loan will be repaid in 25 years. Rate of interest on loan is 9% p.a. Compute the maximum amount of loan he can take from the housing finance company and what amount of savings he will have to withdraw to meet his commitment of buying a house?

Solution: In this case we have to compute the maximum loan amount, i.e. PV which will be paid back in 25 years @ 9% p.a. convertible monthly with an EMI of Rs. 12,000 p.m.

With the help of Financial Calculator

12000 PMT
0.75 *i*
300 *n*

Comp PV = –1429939.46 rounded off to Rs. 14,30,000 and he will have to sell his financial assets worth Rs. 10,70,000.

Since payment is monthly, we have to convert the number of years into months and the rate will be divided by 12 to compute the monthly rate.

Always remember that a loan is always assumed to be PV while doing all the calculations.

With the help of Excel

Go to fx, select the category: Financial, select PV and press ok

Rate 9%/12
Nper 25 × 12
Pmt 12000
Type 0
Formula result = Rs. 14,29,939.46

Q. How much should be saved by a person today to get Rs. 20,000 per annum at the end of every year for 5 years if the rate of return expected is 8% p.a.? Or find the present value of an annuity which pays Rs. 20,000 p.a. for 5 years @ 8% p.a.?

Solution: With the help of Financial Calculator

20000 Pmt
5 *n*
8 *i*
Comp PV = –79854.20

Similarly, we can compute the present value of income stream in Excel.

Q. Sudhir wishes to accumulate Rs. 45,00,000 for his retirement which is expected after 19 years. He wishes to invest semi-annually into a diversified equity fund with a growth option. Assuming a return of 8% per semi-annual, how much amount per semi-annual should Sudhir invest in order to meet his goal of having a nest egg of Rs. 45 lakh?

4500000 FV
38 *n*
8 *i*
Comp Pmt = –20425.21

3.8 COMPUTATION OF RATE AND NUMBER OF PERIODS

How to compute rate (i) for an annuity?

Q. A person wishes to accumulate Rs. 28,00,000 to meet various goals which will arrive after 12 years. He can save Rs. 10,000 p.m. What rate should the investments generate to meet his goals which need to be fulfilled after 12 years?

Solution: We will compute the value of *i* in this way:

–10000 Pmt
144 *n*
2800000 FV

Comp *i* = 0.848 monthly or 10.18% annually.

Q. Anilesh met a financial planner while travelling from Delhi to Mumbai. After introductions they started discussing their job profiles. Anilesh is a businessman and runs his business smoothly but lacks knowledge about investments. The financial planner explained to him how proper investment of money is different from saving money. Anilesh can save Rs. 25,000 p.m. for 13 years. He wishes to accumulate Rs. 1 crore. What rate of return should the investments provide to meet this?

Solution:

–25000 pmt
156 *n*
10000000 FV

Comp *i* = 1.07456 monthly or 12.895 annually

To compute the annual rate, the monthly rate will be multiplied by 12 to get the annualized return.

How to compute the number of periods (n)?

To compute the number of periods the pmt/annuity will take to accumulate to a certain amount at a certain rate of return, we need to calculate *n*.

How to compute with the help of Financial Calculator:

———— Pmt
———— *i*
———— FV

Compute *n*

Q. Mr. Uday invests Rs. 2,500 at the beginning of every month into two systematic investment plans for higher education of his two sons at an annual rate of 12% p.a. convertible monthly. His elder son requires Rs. 15,00,000 and the younger son requires Rs. 17,00,000. Compute the number of years required to make this happen?

Solution in Financial Calculator

For elder son

–2500 Pmt
Bgn
1 *i*
1500000 FV
Compute *n* = 194.70 months or 16.22 years

For younger son

–2500 Pmt
Bgn
1 *i*
1700000 FV
Compute *n* = 205.56 months or 17.13 years

Solution in Excel

For elder son

Go to fx, select the category: Financial, select Nper and press ok

Rate 12%/12 or 0.01
Pmt –2500
FV 1500000
Type 1
Formula result =194.70 months or 16.22 years.

For younger son

Rate 12%/12 or 0.01
Pmt –2500
FV 1700000
Type 1
Formula result = 205.56 months or 17.13 years

Q. A person took a loan of Rs. 3,00,000 and it is to be paid in 6 annual installments with a coupon rate of 12% p.a. Compute the amount of equated annual installments?

Solution:

–300000 PV
6 *n*
12 *i*
Compute Pmt =72967

Q. An income stream provides Rs. 2,000 for the first 3 years and Rs. 3,000 for the next 3 years. If interest rate is 14% per annum, how much money should be taken in lieu of the above payments or compute the present value of the income stream?

Solution:

Step 1

Present value of income stream for 1st 3 years:

2000 Pmt
3 *n*
14 *i*
Compute PV = –4643.26 (1)

Step 2

Present value of income stream for the next 3 years:

3000 Pmt
3 *n*
14 *i*
Compute PV = –6964.89
6964.89 FV
3 *n*
14 *i*
Compute PV = –4701.10 (2)

Present value of the two income streams = (1) + (2) = 9344.36

In this case, the income stream in the 2nd phase of 3 years has to be brought at today's terms, i.e. present value at the beginning of the investment.

Q. Seema is 22 years old and saves Rs. 1, 00,000 every year at the end of every year into a deposit which pays 8% p.a. She will save for 15 years and after that she wishes to use this money partly to finance her trip to Germany which costs Rs. 1,20,000 in today's terms and partly to finance the purchase of a house. Inflation is assumed to be 4% for a 15 year period. Calculate the amount which can be used to finance the purchase of a house after 15 years?

Solution: First, we have to compute how much will be accumulated in 15 years.

–100000 Pmt
8 *i*
15 *n*
Compute FV = Rs. 27,15,211 (1)

The second step is to compute the amount of money required by Seema after 15 years, to visit Germany. In terms of today, the amount required is Rs. 1,20,000 which will increase with the rate of inflation.

–120000 PV
15 *n*
4 *i*
Compute FV = Rs. 2,16,113 (2)

In the third step, we have to compute how much will remain for financing the house purchase after meeting the expenses for the trip abroad.

(1) – (2) = 2715211 – 216113 = Rs. 24,99,098 or nearly Rs. 25 lakh

Q. Mr. Shah has identified a house that he wishes to purchase for Rs. 30 lakh. He is 35 years old and wishes to pay back the loan in 20 years through monthly installments (in due). He approached a housing finance company who has agreed to finance up to 80% of the cost of the house. The rate of interest is 9% p.a. convertible monthly.

Solution: The first step is to calculate the amount of loan that the housing finance company will give 80% of Rs. 30,00,000 is Rs. 24,00,000.

–2400000 PV
9%/12 (0.75) *i*
20 × 12 (240) *n*
Compute Pmt = 21593.42
Bgn
Compute Pmt = 21432.67

Q. What is the future value of a regular annuity of Rs. 10,000 earning a rate of interest of 12% for 5 years?

10000 Pmt
12 *i*
5 *n*
Compute FV = 63528.47

Q. What is the amount that has to be invested at the end of every year for a period of 6 years at the rate of interest of 15% in order to accumulate Rs. 1,000 at the end of 6 years?

Solution:

1000 FV
15 *i*
6 *n*
Compute Pmt = 114.24

3.9 DEFERRED ANNUITY

How to Compute the Present Value of a Deferred Annuity?

Lata wishes to invest a lump sum for her future security. She is 40 years old and her health does not allow her to work till the age of 60 but the pension from her employer will start only after she has attained 60 years of age. She is single and wishes to retire after 10 years. Her employer will not give her a pension for a period of 10 years, i.e. from 50 to 60 years of age. She wishes to save a lump sum amount now which will enable her to get an yearly annuity of Rs. 2,50,000 at the end of every year, with the first payment occurring at the end of the 11th year from now. She is expecting a return of 12% on her investments. How much should she invest now?

Solution:

12% p.a.				12% p.a.
0	10	11	12 (Rs. 2,50,000 annually)	20

With the help of a Financial Calculator

Step 1: We have to find the present value of the annuity for 10 years

250000 Pmt

12 *i*

10 *n*

Comp PV = –1412555.75 (at year 10)

Step 2: To compute the PV of this amount at year 1 as we have to invest the money today

1412555.75 FV

12 *i*

10 *n*

Comp PV= –454805.15

The amount will grow for 10 years and it will start paying out at the end of the 11th year. It is an ordinary annuity which starts paying after one period. If a person invests some money into a bond the first payment of interest will come after a lapse of one year, i.e. end of the same year or beginning of the next year. Thus, at the end of the11th year or at the beginning of 12th year, is one and the same thing.

With the help of Excel

Step 1: Go to fx, select the category: Financial and select PV

Rate 12%

Nper 10

Pmt 250000

Type 0 (payment at the end)

Formula result = –1412555.75

Step 2: Feed the values in the required columns and formula result = –454805.15.

Q. Rita wishes to save some lump sum money for her son's higher education which will start at the end of 12 years. He will require Rs. 2,40,000 at the beginning of every year for five years. The first payment will start at the beginning of the 13th year. Rate of return expected is 14% p.a. How much money should be invested now to meet the target of her son's education?

Solution: This question is both easy as well as difficult. If understood properly deferred annuity numerical becomes very easy.

We know that Rita's son requires money after 12 years and at the beginning of the 13th year.

We also know that end of 12th year means beginning of 13th year.

If we assume it to be an ordinary annuity:

The money will grow for 11 years and the 1st installment will be assumed to be at the end of the 12th year.

We have to start deferred annuity calculations from the end and come to year 0.

Step 1

240000 Pmt

5 *n*

14 *i*

Comp PV = –823939.43 (P/Y = 0 (at the end)

Step 2

823939.43 FV

11 *n*

14 *i*

Comp PV = –194958.38 (P/Y = 0 at the end)

If we assume it to be annuity due:

Step 1

240000 Pmt

Bgn

5 *n*

14 *i*

Comp PV = –939290.95 (P/Y = 1 at the beginning of the period)

Step 2

939290.95 FV
12 *n*
14 *i*
Comp PV = –194958.38

How to Compute Pmt (Equal withdrawal) in Case of Deferred Annuity

Suppose a person makes a certain investment, i.e. a one-time investment and wishes to know how much he can withdraw per annum, per month, per quarter or per half year, after a certain period of deferment; we should be in a position to answer his query.

We take a simple example to do this.

Q. Sumana has Rs. 3,50,000 to invest now. She does not require this money for 15 years. She wishes to invest this money in a fund which can provide her 14% return per annum and then she can withdraw every year starting from the end of the 16^{th} year an equal amount for the next 16 years. Calculate the amount of annual withdrawal?

Solution:

Step 1: In this case we first have to find out the future value of Rs. 3,50,000 invested now @14% p.a.

–350000 PV
14 *i*
15 *n*
Comp FV = Rs. 24,98,278.29

Step 2: Now, this Rs. 24,98,278.29 will be invested at the same rate of 14% and will start paying annual installments.

–2498278.29 PV
14 *i*
16 *n*
Comp Pmt = Rs. 3,98,763.68

So, she can withdraw an amount of Rs. 3,98,763.68 every year at the end of every year for 16 years. This is an ordinary annuity. At the end of 16 years of withdrawal the whole principal will be exhausted.

Q. Pradeep wishes to save Rs. 2,000 every month at the beginning of every month for 10 years. After this he wishes to withdraw an equal amount at the beginning of every month for the next 20 years. He wishes to get an annual rate of 12% on his investments. He has approached you to do all the calculations so that he can know the amount that he will get in the form of a monthly annuity

and whether this will be sufficient for him to lead a comfortable life, or if he should increase his contribution every month?

Solution:

Step 1: We have to first find out how much money will be saved by him in these 10 years.

2000 Pmt
Bgn (Payment at the beginning type = 1)
120 *n* (10 years × 12 = 120 months)
1 *I* (12% p.a. means 1% monthly)
Comp FV = Rs. 4,64,678.15

Step 2: Now we have to find out the amount that he will be able to withdraw at the beginning of every month after investing this amount.

–464678.15 PV
240 *n*
1 *i*
Bgn
Compute Pmt = 5065.84

Q. Rama wishes to go to USA after 5 years to meet her brother and then every year for next 5 years to meet her daughter who will be starting studies in the US. The present cost of going to US is Rs. 2,00,000 and will increase every year by 4% p.a. The rate of return is 12% p.a. How much should she invest now to meet the expenses of visiting the US for all 6 years?

Solution: In this case we have to find out first the amount of money required after 5 years and then every year, which will increase with the rate of inflation. Always keep in mind that cost always increases with the rate of inflation.

BOX

Amount required	*In Rs. (increase @ 4% p.a.)*	*To save this money @ 12% p.a. for making available in the*	*Amount to be invested Rs.*
After 5 years or in 6th year	243331	6th (money will grow for 5 years)	138073.00
7th year	253064	7th	128210.00
8th year	263187	8th	119053.00
9th year	273714	9th	110549.00

10th year	284663	10th	102652
11th year	296050	11th (money will grow for 10 years)	95320
		Total amount to invest now	693857

She can invest in 6 instruments, each giving a return of 12% p.a. and the amount will be available to her every year after a deferred period of 5 years.

Q. What is the present value of the income stream which provides Rs. 50,000 for the 1st 5 years, Rs. 75,000 for the next 5 years and Rs. 85,000 for the remaining 5 years, when the rate of interest for all the years is 8% p.a?

Solution: In this case, let us first understand deferred annuity, with the help of a line. It is always better in case of deferred annuity questions to make such lines so as to do the thing correctly.

50000 (8%) 75000 (8%) 85000 (8%)

0 5 10 15

We have to find the value at 0 year that is, the present value. We have to start from the end, i.e. from 15th year and come down to 0 year.

Step 1 is to compute the PV of Rs. 85,000 p.a. which will come from the 11th year to the 15th year. When, whether payment will come at the beginning or at the end is not mentioned, we will assume that it will come at the end of the period. Here, it is at the end of the year.

85000 Pmt

5 *n*

8 *i*

Comp PV = Rs. 3,393,80 (Paisa has been ignored here; this PV is at the end of the 10th year)

Now this PV has to be brought at the 0 year

339380 FV

10 *n*

8 *i*

Comp PV = Rs. 1,57,199 (a)

Step 2 is to compute the PV of Rs. 75,000 for 5 years and then bring that PV to the 0 year

75000 Pmt

5 *n*

8 *i*

Comp PV = Rs. 2,99,453 (this PV is at the end of the 5th year)

299453 FV

5 *n*

8 *i*

Comp PV = Rs. 203803 (b)

Step 3 is to compute the PV of income stream of Rs. 50,000 for 5 years.

50000 Pmt

5 *n*

8 *i*

Comp PV = Rs. 1,99,636 (c)

Total PV = Rs. (a) + (b) + (c) = Rs. 5,60,638

Q. It may also be a case when interest rates are different for 15 years; for example, rates may be different for all the three phases of 5 years. In that case, while calculating present value we have to be careful about the return on investment prevailing in that phase. This means that discounting will be done depending on the rate prevailing in that phase when income stream is continued.

Q. Suppose a person is given an option to receive Rs. 5,00,000 now or to get an income stream of Rs. 1,40,000 p.a. for 3 years and Rs. 1,20,000 for the next 3 years when interest rate in the first 3 years is 8% p.a. compounded semi-annually and in the next 3 years it is 9% compounded annually. Which option is the better one?

Solution: Step 1 is to calculate the present value of the income stream which is coming in the second term of 3 years.

120000 Pmt

3 *n*

9 *I* (compounding is annual)

Comp PV = Rs. 3,03,755 (This PV is at the end of first 3 years. Now it will be discounted at 8% p.a. (4% semi-annually) for 3 years to bring it at year 0)

303755 FV

6 *n*

4 *i*

Comp PV = Rs. 2,40,062 (a)

Step 2 is to compute the PV of income stream at year 0 (year 0 means at the beginning that is today)

70000 Pmt

6 *n*

4 *i*

Comp PV = Rs. 3,66,950 (b)

Present value today is (a) + (b) = 607012

In this case, option 2 is better as the present value, i.e. the value today of the income stream which is coming in 6 years is more than Rs. 5,00,000 which he is getting today.

Q. Sameer wishes to save Rs. 50,000 every quarter into a fund for 12 years. After this he wishes to take retirement and do social service as he feels that some years of his life should be spent in serving society. He needs Rs. 84,000 every month after retirement for 15 years and he has a high risk appetite now. After retirement he wishes to invest his funds @12% p.a. At what annual rate should he invest his quarterly annuity so that he can meet his target of getting Rs. 84,000 every month at the beginning of the month for 15 years when he can invest at 12% p.a.?

Solution: In this case, first we have to find out the quantum of money which should be invested after 12 years to generate the required monthly annuity for 15 years.

Step 1:

84000 Pmt
Bgn (In excel and FC – 100/200 Type = 1)
180 *n*
1 *i*
Comp PV = Rs. 70,69,010

Step 2: We have to find out the rate at which Rs. 50,000 should be invested every quarter in order to generate Rs. 70,69,010.

7069010 FV
– 50000 Pmt
48 *n*
Comp *i* = 4.05% (Quarterly means 16.20% annually)

Q. Saurabh wishes to have Rs. 2,50,000 after 5 years. He would like to make equal payments at the end of each year into an account which pays an interest rate of 8% p.a. What should be his annual payments?

Solution: We have to compute the amount to be saved every year at the end of every year to enable Saurabh to get Rs. 2,50,000.

250000 FV
8 *i*
5 *n*
Comp Pmt = Rs. 42,614

3.10 ANNUITY IN PERPETUITY

This annuity is an annuity which will never stop and will continue forever. Suppose a person knows that he requires Rs. 1,20,000 every year and the interest rate is 10%. He should invest a certain amount into a fund which will continue to pay Rs. 1,20,000 p.a. and the principal will be safe. The amount invested will be Rs. 12,00,000 which will generate an interest amount of Rs. 1,20,000 and the annuity will continue forever assuming interest rates remain the same.

The formula to calculate present value of an annuity in perpetuity is as follows:

PV = Annuity/Rate
= 120000/0.10
= Rs. 12,00,000

3.11 GROWING ANNUITY

Let us understand this with the help of a case study. Rama is 30 years old and gets an annual salary of Rs. 4,50,000 (take home). Her salary increases by 10% every year. She has planned to save 20% of her salary every year. Rate of return on investments is 12% p.a. How much will be accumulated at the time of her retirement at the age of 60?

Solution: In this case, salary is increasing by 10% every year. This is growing annuity. The amount of saving in the second year will be more than the savings in the first year. The first installment of saving will be 20% of Rs. 4,50,000 i.e. Rs. 90,000.

With the formula:

FV = 90000 {(1.12)^30 – (1.10)^30}/(1.12) – (1.10)
= 90000 (29.95992 – 17.44940)/.02
= 90000 (625.52589)
= Rs. 5,62,97,330

Solution with Excel

BOX

Year	*Amount invested*	*Interest rate factor*	*No. of years*	*FV*
1	90000	1.12	29	2407494
2	99000	1.12	28	2364503
3	108900	1.12	27	2322280

Contd.

Contd.

4	119790	1.12	26	2280810
5	131769	1.12	25	2240081
6	144945.9	1.12	24	2200080
7	159440.49	1.12	23	2160793
8	175384.539	1.12	22	2122207
9	192922.9929	1.12	21	2084311
10	212215.2922	1.12	20	2047091
11	233436.8214	1.12	19	2010536
12	256780.5035	1.12	18	1974633
13	282458.5539	1.12	17	1939372
14	310704.4093	1.12	16	1904740
15	341774.8502	1.12	15	1870727
16	375952.3352	1.12	14	1837321
17	413547.5688	1.12	13	1804512
18	454902.3256	1.12	12	1772289
19	500392.5582	1.12	11	1740641
20	550431.814	1.12	10	1709558
21	605474.9954	1.12	9	1679030
22	666022.495	1.12	8	1649047
23	732624.7445	1.12	7	1619600
24	805887.2189	1.12	6	1590678
25	886475.9408	1.12	5	1562274
26	975123.5349	1.12	4	1534376
27	1072635.888	1.12	3	1506976
28	1179899.477	1.12	2	1480066
29	1297889.425	1.12	1	1453636
30	1427678.367	1.12	0	1427678
				56297339

3.12 NET PRESENT VALUE AND IRR

Comparing Investment Returns

What is Net Present Value (NPV)?

Net Present Value of an investment project is the difference between the sum of the discounted cash flows which are expected from the investment and the amount which is initially invested. This is the traditional valuation method used in the discounted cash flow measurement.

The following steps are involved in this process:

1. Calculation of expected cash flows (often per year) that result out of the investment
2. Discount these cash flows for the cost of capital (an interest rate to adjust for time and risk)

   The intermediate result is called: **Present Value**.
3. Subtract the initial investments made.

The end result is called: **Net Present Value**.

Therefore NPV is an amount that expresses how much value an investment will result in. This is done by measuring all the cash flows which will occur over time, at the beginning of the period.

If the NPV method results in a positive amount, the project should be undertaken.

The difference between the present value of cash inflows and the present value of cash outflows

The present value of cash outflows is the amount of investment made. NPV is used in capital budgeting to analyze the profitability of an investment or project.

NPV analysis is sensitive to the reliability of future cash inflows that an investment or project will yield.

Formula:

$$\sum_{t-1}^{T} \frac{C_t}{(1+r)^t} - C_o$$

NPV compares the value of a rupee today to the value of that same rupee in the future, taking inflation and returns into account (discounted at discount rate or the expected rate and not interest rate as in case of PV). If the NPV of a prospective project is positive, it should be accepted. However, if NPV is negative, the project should probably be rejected because cash flows will also be negative.

For example, if a retail clothing business wants to purchase an existing store, it would first estimate the future cash flows that store would generate and then discount those cash flows into one lump sum present value amount, say Rs. 6,00,000. If the owner of the store was willing to sell his business for less than Rs. 6,00,000, the purchasing company would likely accept the offer as it presents a positive NPV investment. Conversely, if the owner would not sell for less than Rs. 6,00,000, the purchaser would not buy the store as the investment would present a negative NPV at that time.

What is the difference between net present value and internal rate of return? How are they used?

Both these measures are primarily used in capital budgeting or, the process by which companies determine whether a new investment or expansion opportunity is worthwhile. Given an investment opportunity, a firm needs to decide whether undertaking the investment will generate net economic profits or losses for the company.

To do this, the firm estimates the future cash flows of the project and discounts them into present value amounts using a discount rate that represents the project's cost of capital and its risk. Next, all of the investment's future positive cash flows are reduced into one present value number. If we subtract from this number the initial cash outlay or the amount invested, it is Net Present Value (NPV) of the investment.

Let us illustrate this with an example. Suppose ABC Company wants to buy a small company, XYZ Ltd. ABC determines that the future cash flows generated by the company when discounted at a 12% annual rate, yield a present value of Rs. 25 lakh. If the XYZ company's owner is willing to sell for Rs. 22 lakh, then the NPV of the project would be Rs. 3 lakh (25 – 22 = 3). Rs. 3 lakh NPV represents the intrinsic value that will be added to ABC Ltd if it undertakes this acquisition.

So, ABC's project has a positive NPV but from a business perspective, the firm should also know what rate of return will be generated by this investment. To do this, the firm would simply recalculate the NPV equation, this time setting the NPV factor to zero and solve for the now unknown discount rate. The rate that is produced by the solution is the project's internal rate of return (IRR).

For this example, the project's IRR could, depending on the timing and proportions of cash flow distributions, be more than 12%. If there were a project that ABC Ltd could undertake with a higher IRR, it would probably pursue the higher yielding project instead. Thus, you can see that the usefulness of the IRR measurement lies in its ability to represent any investment opportunity's return and to compare it with other possible investments.

Limitations of Net Present Value

Although NPV measurement is widely used for making investment decisions, a disadvantage of NPV is that it does not account for uncertainty after the project decision has been made.

NPV is unable to deal with intangible benefits, which decreases its value for strategic issues and projects.

PRACTICE QUESTIONS ON FINANCIAL MATHEMATICS — 1

These practice questions will help students doing financial planning courses and also individuals and organizations who are into the advisory function of financial products. With the help of various types of situations in the form of problems which are covered here, they will be in a position to help their clients to set goals that are measurable, i.e. in quantified terms.

My endeavor is to give as much information as possible of the various situations that financial planners/financial consultants can face with their clients. We will start with simple questions; wherever required hints for calculation are given.

1. Rama invests Rs. 1,35,460 into a fund. How much amount she will get after 14 years if in the first 4 years the rate of interest is 9% per annum; in the next 5 years it is 8.5% p.a. and in the last 5 years it is 8.75% p.a.?
2. Gurveen has been working with a private sector bank where she gets part of her salary as a fixed amount and part as variable (bonus, incentives, etc.). She has received Rs. 2,49,000 this year as incentive and she wishes to invest it for 6 years and buy a car with the accumulated amount. The rate of return is 12.75% p.a. Compute the amount which she will get after 6 years?
3. Radha has been saving for the last 5 years in her piggy bank whatever amount she used to get as pocket money. She broke open her piggy bank yesterday and found Rs. 13,420 in it, which she wishes to invest into a bank FD which pays interest semi-annually. The rate of interest is 7.5% and period is 7 years. Compute the accumulated amount which she will get after 7 years?
4. Sameera invested Rs. 4,00,500 into a deposit for 10 years @ 9.5% p.a. For the first 5 years the bank pays semi-annual interest and for the next 5 years compounding is quarterly. Compute the accumulated amount to be received by Sameera after a period of 10 years?
5. Shashi invested Rs.5,10,600 in a deposit which pays 12% interest per annum and compounding is done monthly. How much money will be accumulated in her account after 12 years?
6. Narinder has invested Rs. 3,56,000 into a fund for long term, i.e. for 13 years @10.25% p.a. The issuer pays him interest monthly for the first 7 years and quarterly for the next 6 years. How much can he withdraw after 13 years to meet his goal of higher study of his son?
7. Sudesh is a housewife who is highly educated and always thinks of planning her finances properly. Slowly and systematically she has been able to accumulate a sum of Rs. 2,00,000 in her savings bank account and she happened to meet a financial planner who explained to her that interest in saving account is 3.5% p.a. and inflation is about 5% p.a.

Thus, the return on her money is negative. Now, she has invested that money into a diversified equity scheme of a mutual fund and expects to get a return of 15% p.a. She wishes to keep that money for 8 years. How much will she have accumulated in her account and by how much will the amount differ if she had continued to keep that money in a savings bank account?

8. Seema has plans to invest some lump sum money in a deposit which pays quarterly interest and the interest is reinvested in the same fund. She has Rs. 3,75,000 to invest for 14 years @12% p.a. How much will be accumulated in her account after 14 years?
9. Anil has some lump sum money to invest for a period of 15 years when he will be requiring money for his daughter's higher education. His daughter is 3 years old and Anil is very cautious about saving enough money to enable him to provide her with a good education. He wishes to invest Rs. 3,00,000 into a scheme which provides him 14% return per annum. How much money will be available after 15 years in Anil's account?
10. Mr. Rao spends Rs. 3,60,000 every year as annual living expenses. He is 25 years old and wishes to retire at the age of 60. Inflation is 5% p.a. throughout the period and the amount can be invested at 10% p.a. How much will be required by him at the age of 60 to spend every year?
11. You invest Rs. 2,58,000 now for 4 years in a deposit offering a return of 9% p.a. You then can reinvest the accumulated money for a further period of 5 years offering a rate of return of 10% p.a. Calculate the amount accumulated by you after 9 years?
12. Savita has invested Rs. 57,000 into a deposit for 8 years. In the first 2 years the rate of interest is 9% per annum, in the next 3 years it is 8% p.a. and in the remaining phase of 3 years it is 7% p.a. Calculate the amount accumulated by her after 8 years?
13. What amount should be invested by Somya now to grow to Rs. 6,00,000 in 8 years time when the rate of interest is 9% p.a. and compounding is done once a year?
14. Rama needs Rs. 12,00,000 after 7 years to meet the education costs of her daughter. Rate of interest is 9% compounding monthly. How much lump sum amount should she invest now to enable her to withdraw an amount of Rs. 12,00,000 after 7 years?
15. Ridhima needs Rs. 9,00,000 in today's terms for her son's higher education. Cost of education is increasing by 6% every year and the money is required after 8 years. How much money will she require after 8 years to meet this goal and how much is to be saved now if the rate of return is 9% p.a.

16. What amount must be invested for 8 years at 10% p.a. when compounding is done quarterly to accumulate to Rs. 6,00,000?
17. Prachi needs Rs. 12,00,000 after 8 years for her son's higher education and Rs. 10,00,000 after 6 years for her daughter's higher education. Rate of return is 14% p.a. How much lump sum amount she should invest now to meet both her financial goals of children's higher education?
18. Samir wishes to buy a car costing around Rs. 5,00,000 after 3 years with his own saved money. He has a high risk appetite and wishes to invest in a sector fund about which he is optimistic. He expects a return of 20% from this. Assuming his expectations are going to be correct, how much should he invest now?
19. Ravi is a self-employed person and is doing very well in his business. He has planned to buy a house after 10 years with his own money without taking any loan. He has identified a house which costs around Rs. 25,00,000 now. The cost of houses are increasing at the rate of 7% per annum. How much will he require to buy the similar house after 10 years?
20. The cost of a one-month trip to Australia is Rs. 3,50,000 in today's terms. Rahul wishes to make a one-month trip to this beautiful country after 3 years. Cost of the trip is increasing by 5% every year. Rate of return on investment is 12% p.a. How much money will he require in order to make this trip after 3 years and how much should he invest now at annual compounding in order to make this dream a reality?
21. The cost of cars is increasing by 4% every year. Sudhir wishes to purchase a car after 4.5 years. Present cost of a car is Rs. 4,39,700. What amount will he have to pay for purchase of a car after 4.5 years?
22. Rama has been living in South Africa for the last 10 years. His father is a central government employee and will retire after 7 years. His father has visited South Africa many times during these 10 years but the climatic conditions did not suit him. Rama is earning a very good salary there and wishes to invest some lump sum amount now so that his father gets Rs. 35,00,000 after 7 years to have a comfortable standard of living. The rate of return is 9% p.a. convertible monthly. How much does he have to invest now to accumulate the required sum?
23. Sudhir is the elder child of Mrs. Nanda and has one younger sister who is doing M.A. (Eco) from Delhi University. Sudhir's father expired two years ago and has left Rs. 25 lakhs worth of financial assets which he wishes to keep for his mother. He wants to take responsibility for his sister's marriage and spend Rs. 5,00,000 on this, after 5 years. He has already saved Rs. 2,00,000 and for the balance amount he will arrange a loan from his employer. Rate of return on investments is 10% p.a. After 5

years how much loan will he have to take from his employer in order to spend Rs. 5,00,000 on his sister's marriage?

24. Vishnu has already saved Rs. 15,00,000 and he wishes to have Rs. 60 lakhs in his account after 15 years. Rate of return on investments is 8% p.a. compounded quarterly.

    How much more money should he invest now to make the total Rs. 60 lakhs after 15 years?

25. Reena has received Rs. 2,56,000 as incentive from his employer which she wishes to invest into a fund which pays 12% p.a. return. After 4 years she wishes to invest the accumulated sum in 8% RBI bonds (taxable). How much money will accumulate in her account after 10 years?

ANSWERS TO PRACTICE QUESTIONS — 1

BOX

Sr. No.	*Rupees*
1.	437332.81
2.	511562.44
3.	22469.11 (Rate will become 7.5/2 = 3.75% and n will be 14 instead of 7 because of semi-annual compounding
4.	1018640.96 (1^{st} step n = 10, I = 4.75%; 2^{nd} step n = 20 and I = 2.375%
5.	2139728.32 (rate will be 1% and n will be 12 × 12 = 144
6.	1334932.67 (for 2^{nd} term rate will be 2.5625 and n = 24 PV = −727332.51
7.	611804.57 and 348442.76
8.	1962979.89 (n = 14 × 4 = 56 and i = 12/4 = 3% per quarter
9.	2141381.39
10.	1985765.53 (PV will increase with inflation rate, expenses increase with the rate of inflation)
11.	586528.49
12.	104508.22
13.	301119.76
14.	640614.32
15.	1434463.26, 719908.74
16.	272262.33
17.	876257.40

18.	289351.85
19.	4917878.39
20.	405168.75 and 288391.11
21.	524573.67
22.	1868458.43 (Rate will be 9/12% and n will be $n \times 12$
23.	177898.00 (Rs. 2,00,000 will become Rs. 3,22,102 after 5 years and for the balance he will take a loan)
24.	328693.60 (Rs. 15 lakhs will grow to Rs. 49,21,546 after 15 years at quarterly compounding)
25.	644929.32 (RBI gives interest semi-annually and RBI bonds matue after 6 years)

PRACTICE QUESTIONS ON FINANCIAL MATHEMATICS — 2

26. Manu has plans to invest a lump sum amount of Rs. 3,00,000 which he got from his grandfather as a part of his estate. He is 23 years old and wishes to invest this money as a part of his retirement planning. Since he has a long term horizon he wishes to invest money in to a diversified equity fund for 20 years. After this period he wishes to switch the accumulated sum in to equity oriented balanced fund for a period of 9 years and to switch the accumulated sum to RBI 8% (taxable) bonds thereafter for the remaining period. How much money will accumulate in his account at the age of 60 if diversified equity provides an annualized return of 15% p.a. and the balanced fund provides a return of 12% p.a.?
27. Rama wishes to set aside Rs. 3,500 from her salary every month in the beginning of the month for 12 years in a balanced mutual fund scheme. Rate of return for the first 4 years is assumed to be 12% p.a. and for the next 8 years it is 11.5%. Calculate the amount of money accumulated in these 12 years?
28. Reena who is 34 years old, is single (no plans to marry) and is in the habit of spending her entire salary every month without bothering about saving and investment. She happened to meet a financial planner who explained to her that money saved is money earned and also explained the power of compounding and rupee cost averaging. She is convinced and plans to save Rs. 5,000 every month at the end of every month, systematically. Assuming that her investment in various equity, balanced and debt funds will give an average return of 13.75%, what amount will be accumulated when she retires at age 60?
29. Sameera wishes to have Rs. 2 crore when she retires at the age of 60. She is 24 now and wishes to save the required amount at the end of every

month. The investment would generate a return of 14% p.a. compounded monthly. How much should she save every month to meet her target of accumulating Rs. 2 crore?

30. How many years will it take for Rs. 4,56,788 to become Rs. 30,00,000 if the rate of return expected is 12.25% p.a. convertible semi-annually?
31. Saurabh wishes to grow Rs. 5,00,000 to Rs. 12,00,000. His time horizon of investment is 8 years. At what rate of return should he invest his money?
32. An amount of Rs. 13,50,000 becomes Rs. 25,00,000 in 8 years when compounding is done monthly. Calculate the monthly rate and the nominal rate in this investment.
33. Richa has three investments as of date:

    Rs. 5,00,000 Diversified equity fund (expected average return 14% p.a.)

    Rs. 4,50,000 Balanced fund (expected average return 12% p.a.)

    Rs. 250000 Debt fund (expected average return 8% p.a.)

    Time horizon is 9 years. Calculate the amount accumulated by her.
34. Gautam has accumulated Rs. 17,88,900 in the last 10 years. He saves at the end of every year.

    Calculate the amount he used to save every year if the return generated on his investments is 12.75% p.a.
35. Ashish wishes to accumulate Rs. 32,00,000 in 15 years. He wishes to save a sum quarterly. Rate of return is 10% p.a. convertible quarterly. Calculate the sum invested every quarter by him.
36. Ramesh is 45 and a half years old and works in a multinational company. He has provided for his children's education and marriage, and built a home with a loan which will be paid off by the time he retires at the age of 60. He is worried only about retirement funding. He wishes to have a kitty of Rs. 25,00,000 at the time of retirement for this goal. Rate of return is 13.25% p.a. Calculate the amount of monthly saving required to meet his target of accumulating the retirement kitty.
37. Sameer has already saved Rs. 2,37,000 and wishes to save Rs. 4,500 every month at the end of every month for the next 14 years. Rate of return on his investments is 11.80%. Calculate the accumulated amount at the end of 14 years. His earlier investments are compounded annually.
38. Raman has bought a house for Rs. 40,00,000 and has availed 75% loan from a bank. The bank charges 9.5% fixed annual rate for a tenure of 20 years. Calculate the amount of monthly installment to be paid by him.
39. Rajan has approached a housing finance company for a loan. The company explained to him that for a loan amount of Rs. 12,00,000 the EMI per month works out to Rs. 12,038 if the loan is taken for a period of

18 years. Please help him in calculating the rate of interest the bank will charge.

40. Ram wishes to buy a residential flat and is trying to find the best available price. He approached 2 banks and the terms offered by them are as follows:

	Loan amount	Term of loan	EMI (Monthly)
Bank A	1250000	12 years	Rs. 16,417
Bank B	1400000	12 years	Rs. 17,549

From which bank will taking a loan be viable option for him?

41. Sunil has been working in a government organization and is staying in accommodation provided by his employer. He has no knowledge of finances and invests only in fixed income instruments like PPF, NSC's and LIC only to save on taxes. He has accumulated Rs. 14,78,000 so far. All his assets are in fixed income instruments. Now he wishes to invest in equity mutual funds through a SIP. Assuming that he can save Rs. 6,500 p.m. for the next 12 years, how much will be his accumulations if fixed income instruments provide him net returns (after tax) of 5.55% and diversified equity provide a return of 14.25% p.a.
42. How many months will it take for Rs. 23,54,600 to become Rs. 50,00,000 if the rate of return is 15% p.a. and compounding is done monthly?
43. A person has investments worth Rs. 4,56,700 as of now and the rate of return is 13% p.a. convertible quarterly. How many quarters will it take for this amount to become Rs. 12,00,000?
44. In the previous question, how many years will it take for the amount to become Rs. 12,00,000 if the rate of return is 13% compounded quarterly?
45. A person has Rs. 2,50,000 in his savings account which he wishes to invest. In the first 2 years the rate of return is 12% per annum, in the next 4 years the rate is 13% p.a. and compounding is done semi-annually. In the remaining period of 5 years the rate of return is 12% p.a. and compounding is done quarterly. Calculate the amount of the investment at the end of 11 years.
46. Calculate the present value of Rs. 8,90,000 receivable after 12 years when for the first 3 years the rate of return is 8.5% per annum, in the next 7 years it is 9% p.a. and in the remaining 2 years it is 9.5% p.a.
47. Rs. 5,60,000 is invested and becomes Rs. 10,00,000 in 6 years. Interest rate in the first 4 years is 8% p.a. and compounding is done annually. Interest in the next 2 years is given semi-annually. Find the annual rate of return in the second phase of 2 years

48. A sum of Rs. 8,65,000 is invested and becomes Rs. 12,00,000 in 5 years when in the first 3 years compounding is done semi-annually, in the next 2 years it is done quarterly and the rate in the second phase is 8% p.a. Calculate the annual rate of return in the first phase of 3 years?
49. An amount of Rs. 3,45,000 is invested by Gurveen and becomes Rs. 7,45,000. In the first 3 years compounding is done quarterly and the rate of return is 9.60% p.a. In the next phase, compounding is done monthly and the rate of return is 12% p.a. Calculate the number of months it will take in the second phase to accumulate an amount of Rs. 7,45,000.
50. How many months will it take if an amount of Rs. 12,00,000 is invested and accumulates to Rs. 18,50,000 when the rate of return is 15.25% p.a. convertible monthly.

ANSWERS TO PRACTICE QUESTIONS — 2

BOX

Sr. No.	*Rupees*
26.	25501966 *Hints:* 3000000 will become Rs. 49,09,961 after 20 years and Rs. 49,09,961 will become Rs. 1,36,15,708 (12% p.a.) in the next 9 years and finally Rs. 2,55,01,966 in the next 8 years, i.e.16 semi-annuals
27.	1069469 (Rs. 3,500 saved every month for the 1st 4 years will also grow for the next 8 years. Rs. 3,500 saved at the beginning of every month for the first 4 years will accumulate to Rs. 2,16,421.9. Investing this money for the next 8 years at a rate of 11.5% p.a. will become Rs. 5,17,011.45. Rs. 3,500 saved for the next 8 years will become Rs. 5,52,457.67
28.	Rs. 1,48,26,062
29.	Rs. 1,565.69
30.	31.66 half years or 15.83 years
31.	11.5646%
32.	.64392 monthly and 7.727 nominal rate
33.	Rs. 33,73,610.85
34.	Rs. 98,303.50
35.	Rs. 23,530.86
36.	Rs. 4,794.09
37.	Rs. 30,40,432.35. Earlier investment will become Rs. 11,29,623.18 with yearly compounding

38. Rs. 27,964
39. 10.05% p.a.
40. Option B as rate of loan is 11% p.a. as compared to 12% p.a. in case of Bank A
41. Rs. 52,74,684.77
42. 60.62 months
43. 30.20 quarters
44. 7.55 years
45. Rs. 9,37,383.72
46. Rs. 3,17,897
47. 14.0717% p.a. We will start with a PV of Rs. 5,60,000 and calculate the amount of FV after 4 years Rs. 7,61,873.81. Now this is PV, FV we know and we know the period. Calculate *i*
48. 5.71% p.a. We will start calculating this question from the back, i.e. FV of Rs. 12,00,000
49. 48.76 months or 49 months approximately
50. 34.27 months

PRACTICE QUESTIONS ON FINANCIAL MATHEMATICS — 3

51. If a borrower promises to pay Rs. 20,000, eight years from now in return for a loan of Rs. 12,550 today, what nominal interest rate is implied in this transaction?
52. Rs. 1,00,000 is being borrowed to be repaid in four equal annual installments with 8% p.a. interest. Approximately how much principal is amortized with the first payment?
53. Calculate the future value of a regular annuity of Rs. 10,000 earning a rate of interest of 12% p.a. for 5 years.
54. What is the amount that has to be invested at the end of every year for a period of 6 years at the rate of interest of 15% in order to accumulate Rs. 10,000 at the end of six years?
55. Compute the present value of Rs. 1,00,00,000 (crore) receivable after 60 years, if the discount rate is 10%.
56. If the interest rate is 12% p.a. calculate the amount to be invested today to earn an annuity of Rs. 10,000 for 5 years commencing from the end of the first year.
57. Calculate the amount to be deposited now at the rate of return of 10% so that a constant annual income of Rs. 10,000 can be withdrawn indefinitely.

58. If the nominal rate of return is 16% and compounding is done quarterly, what will be the effective rate of return for an investor?
59. M/s AB have Rs. 10,00,000 worth of debentures to be redeemed after five years. If the rate of interest is 14% per annum, what is the amount that has to be invested in a sinking fund to redeem the above debentures?
60. Calculate the amount that should be deposited now so that a constant monthly income of Rs. 10,000 p.m. can be withdrawn indefinitely, if the rate of interest is 12% p.a.
61. Calculate the amount to be invested today to get an annuity of Rs. 10.000 for five years commencing from the end of two years from today, if the interest rate is 12% p.a.
62. The IDBI deep discount bond offers investors Rs. 3,00,000 after 25 years, for an initial investment of Rs. 7,500. Calculate the implied interest rate.
63. Deep discount bonds of an organization, offers investors Rs. 2,00,000 after 25 years, for an initial amount of Rs. 5,500. Calculate the interest rate offered on this.
64. Mr. Sharma borrowed Rs. 5,00,000 from a bank, to be repaid within 5 years at an interest rate of 15% p.a. Calculate the equated annual payment to be made by him so that by the end of 5 years, the entire amount of the principal along with the interest would be paid.
65. How much should a company invest at the beginning of each year at 14% so that it can redeem debentures of Rs. 15 lakhs at the end of 10 years?
66. Choose the one which gives the highest return among the following assuming an interest rate of 14% p.a.
    (a) Rs. 1,02,000 now
    (b) Rs. 2,00,000 after 6 years
    (c) Rs. 15,000 p.a. in perpetuity
    (d) Rs. 1,000 per month for a year and Rs. 95,000 at the end of the year
    (e) Rs. 18,000 per year for the next 10 years
67. Mr. Abhay buys a car using Rs. 3,00,000 loan with monthly repayments payable at the end of each of the next 24 months. Interest rate on the loan is 12.5% p.a. Calculate the EMI for the loan.
68. A loan of Rs. 1,00,000 is repaid over a period of five years by equal monthly repayments in arrears of Rs. 2,500. Calculate the monthly rate and the nominal rate charged on this loan.
69. A person has started saving Rs. 5,500 p.m. in a balanced fund of a good fund house. Assume an average rate of return of 15% p.a. over 16 years. He needs Rs. 40 lakhs to meet his retirement goal. Will the amount accumulated be enough to take care of this need? If yes, find the sum accumulated.

70. Mr. Rahul is 50 years old and wishes to buy a 3-bedroom apartment with 50% of loan amount as he has enough savings to pay 50% of the amount. The cost of the house is Rs. 54,50,000. The bank has offered a rate of 10.25% p.a. for a tenure of 9 years. Calculate the amount of the monthly payments.
71. Sam has got an assignment in the US for a period of 5 years. He can save Rs. 8,00,000 per annum for all these years and wishes to buy a four-bedroom apartment in India. The rate of return on investments is 9% p.a. Calculate the accumulated amount at the end of 5 years.
72. You have been given two options by your landlord; either pay Rs. 5,500 every month as lease rental for 12 months, or not give any rent for the first 3 months and then pay Rs. 7,400 per month for 9 months. If money can be invested at a rate of 12% per annum, which option is more favorable for the landlord?
73. You are given two options; either to receive a lump sum amount of Rs. 1,20,000, or to receive Rs. 7,000 at the end of every month for 16 months. A rate of 12% p.a. can be generated on investments. Which option would you select?
74. How many years will it take for Rs. 8,000 to become Rs. 10,000 if simple rate of interest is 6% p.a.?
75. An investor has Rs. 1,00,000 to invest and wishes to purchase an annuity certain with a term of 10 years. Calculate the amount of the payments that can be provided if the annuity payment is made monthly in arrears and the rate of interest is 8% p.a.

ANSWERS TO PRACTICE QUESTIONS — 3

BOX

Sr. No.	*Rupees*
51.	6% p.a.
52.	Rs. 22,192.08. Pmt is Rs. 30,192.08 (loan of Rs. 1,00,000). 1st years' interest is Rs. 8,000 (.08 × 100000), therefore principal is Rs. 22,192.08
53.	Rs. 63,528.47
54.	Rs. 1,142.37
55.	Rs. 32,842.70
56.	Rs. 36,047.76
57.	Rs. 1,00,000 (it is annuity in perpetuity 10000/.10)
58.	16.985%

59.	Rs. 1,51,283
60.	Rs. 10,00,000
61.	Rs. 32,185.50
62.	15.90%
63.	15.4587%
64.	Rs. 1,49,158
65.	Rs. 68,044.13
66.	Rs. 15,000 in perpetuity (PV = 15000/.14) = Rs. 1,07,142.85
67.	Rs. 14,192.19
68.	1.4395 and 17.27%
69.	Yes, Rs. 43,38,579
70.	Rs. 38,734.29 (loan amount is Rs. 27,25,000)
71.	Rs. 47,87,768.48
72 .	1st option is more favorable for the landlord. Calculate PV for both the options
73.	1st option is better as PV of Rs. 1,20,000 is Rs. 1,20,000 today and PV of an annuity for 16 months is Rs. 1,03,025.11
74.	4.167 years
75.	Rs. 1,213.27. PV is Rs. 1,00,000, $n = 10 \times 12$, $I = 8\%/12$. Compute pmt

PRACTICE QUESTIONS ON FINANCIAL MATHEMATICS — 4

76. An amount of Rs. 7,500 per quarter is deposited into a fund with growth option for a period of 10 years. Average annual return given by the fund house is 16.75% p.a. Calculate the accumulated sum after 10 years.
77. A single investment of Rs. 5,000 is accumulated at a nominal rate of interest of 6% p.a. convertible half yearly for 1 year and followed by a nominal rate of interest of 6% p.a. convertible every 3 months for 1 year. Calculate the accumulated amount of this investment after 2 years.
78. Calculate the present value of a payment of Rs. 1,780 per month for 11 years at a rate of return of 9.25% p.a.
79. Calculate the present value of an income stream payable twice a year at an annual rate of 7.50% per annum, starting in 6 months time with an amount of Rs. 8,500 for 20 years.
80. Calculate the present value of an income stream which provides Rs. 6,500 at the end of the year for 10 years with the 1st payment starting at the end of the 3rd year. Rate of return on investment is 19.5% p.a.

81. Compute the present value of an income stream of Rs. 1,92,000 p.a. which will flow continuously forever when money can be invested at a rate of 9% p.a.
82. An annuity payable annually in arrears has a first payment of Rs. 3,000, with subsequent payments decreasing by Rs. 500 each year till it reaches Rs. 2,000 and the rate of return on investments is 9% p.a. What amount should be accepted in lieu of the above payments?
83. Mr. Khanna is going to retire from a private sector company where there is no provision of pension. He is going to get Rs. 30,00,000 from his employer as retirement benefits. He has some other investments also. He needs Rs. 5,00,000 p.a. for the first 4 years after his retirement as his daughter is studying. After 4 years he requires only Rs. 3,00,000 p.a. for the next 11 years. Rate of return on investments is 6.5% p.a. Calculate the amount of investment required to meet this goal. What amount will he have to withdraw from his earlier investment to fill the gap?
84. A loan of Rs. 50,000 is being repaid over a period of 10 years by a series of level monthly installments. Interest is charged on the loan at the rate of 8% p.a. Calculate the monthly repayment.
85. In the same question, calculate the amount of interest paid in the first six months.

    This calculation will be done in the following way:

    EMI amount will be in rupees and paisa will be ignored.

BOX

Amount outstanding in the beg. (Rs.)	*EMI (Rs.)*	*Principal amount paid (Rs.)*	*Interest paid (Rs.)*	*Outstanding at the end (Rs.)*
50000	607	274	333	49726
49726	607	276	331	49450
49450	607	277	330	49173
49173	607	279	328	48894
48894	607	281	326	48613
48613	607	283	324	48330
Total		1670	1972	

86. Calculate the effective rate of return when the nominal rate of return is 13.50% p.a. and compounding is done semi-annually. The amount of investment is Rs. 1,34,000 for a period of 3 years.

87. Sudha deposited Rs. 45,000 into a fund which pays quarterly interest of 3%. The money is invested for a period of 2 years. Calculate the effective rate of interest and nominal rate of interest.
88. Radha invested Rs. 3,89,500 in a scheme which pays monthly dividend. The options are either to take monthly dividends in cheque form or to reinvest the dividends. Rate of return is 9.8% p.a. convertible monthly. Advise the client about the better option if investment is for 3 years and also calculate the effective rate of return.
89. Sumana invested Rs. 5,67,800 in a mutual fund scheme in which the expected rate of return is 17.84% p.a. If we assume that she will get the required return and investment is held for 4 years, calculate the amount accumulated in this investment and also calculate the real rate of return if she has to meet an inflation rate of 5.5% p.a.
90. Sahil invested Rs. 12,00,000 at a rate of interest of 12% p.a. Inflation rate is 4.74% p.a. Calculate the real rate of return for Sahil.
91. Which investment is more profitable for Rahul?
    (a) An investment of Rs. 1,32,000 which pays dividend of Rs. 12,000 every year for 3 years and grows to Rs. 2,05,000 at the end of 3 years
    (b) An investment of Rs. 1,50,000 which pays dividend of Rs. 13,000 every year for 3 years and grows to Rs. 2,30,000 at the end of 3 years
92. Calculate the difference between the effective rates of return on an investment with a nominal rate of 14% when compounding is done quarterly and monthly.
93. Calculate the real rate of return when a person invested Rs. 12,000 and received Rs. 15,678 after one year. The inflation rate is 6.24% p.a.
94. If the interest rate is 12.75% p.a. calculate the amount to be invested today to earn an annuity of Rs. 5,400 for 7 years, commencing from the end of the first year.
95. If inflation rate is 5% and the tax rate is 30%, calculate the required return to maintain the value of the investment.
96. If an amount of investment grows to Rs. 35.469 in 4 years time when the rate of return is 14%, calculate the amount of investment.
97. Mr. Rohan wishes to save for his daughter's education an amount which is required after 12 years. The cost of education in today's terms is Rs. 15,00,000. Rate of inflation is 5%. How much per month should he start saving from now on to meet his goal when return on investments is 12% p.a.?

98. A housing finance company is offering a housing loan of Rs. 25,00,000 with a down payment of Rs. 2,50,000. Rate of interest is 9.5% p. a. for a period of 16 years. Calculate the amount of the EMI.
99. Calculate the required return to maintain the value of investment when inflation is 6% and tax rate is 33.66% and nominal rate on an investment of Rs. 3,00,000 for 3 years is 10% p.a.?
100. Calculate the real rate of return on an investment if the nominal rate is 9.80% and inflation rate is 4.76%. The amount invested is Rs. 4,50,000 for a period of 4 years and 6 months.

ANSWERS TO PRACTICE QUESTIONS — 4

BOX

Sr. No.	*Rupees*
76.	Rs. 7,45,021.40
77.	Rs. 5,630.00
78.	Rs. 1,47,115.96
79.	Rs. 1,74,683.41
80.	Rs. 19,411.57
81.	Rs. 21,33,333.33
82.	Rs. 6,400.86. In this question, PV of all the cash flows is to be calculated after calculating the amount of cash inflow. This can also be done with the help of NPV method by first feeding the value 0 in place of initial amount invested.
83.	Rs. 35,05,960. He will have to withdraw Rs. 5,05,960 from his other investments to meet this goal
84.	Rs. 606.64
85.	Rs. 1,972
86.	13.955% p.a.
87.	12.55% and 12%
88.	If dividends are reinvested she will get Rs. 5,22,001 after 3 years and if dividend payout option is given then she will get Rs. 3,181 per month and total of Rs. 1,14,513 will be received in 3 years. Interest component on reinvestment option is Rs. 1,32,501. Effective rate is 10.252% p.a.
89.	Rs. 10,94,879.50 Real rate is 11.70 % p.a.
90.	6.93% p.a.

91.	Investment a) as holding period return is 82.57% and CAGR is 22.22%. In case of b) holding period return is 79.33% and CAGR is 21.49%
92.	.182
93.	30.65% and 22.976%
94.	Rs. 24,069
95.	7.14%. Required rate = inflation rate/1-tax rate = 5/1 –.30 = 5/.70 = 7.14286%
96.	Rs. 21,000
97.	We have to calculate the cost of education at the required time which is Rs. 26,93,784 and he has to save Rs. 8,442.83 or Rs. 8,443 every month to meet this target
98.	Rs. 22,837 p.m.
99.	9.044%p.a.
100.	4.81%

PRACTICE QUESTIONS ON FINANCIAL MATHEMATICS — 5

101. Mr. Subramanium invested Rs. 1,25,000 into a scheme and selected a growth option as he is young and has a regular salary income. After one year, he needed money and got Rs. 1,37,500. Calculate the holding period return and CAGR.
102. Mr. Bakshi had invested Rs. 86,000 five years ago and has received the following dividends in these 5 years:

    Rs. 10,000

    Rs. 8,000

    Rs. 7,500

    Rs. 5,000

    Rs. 4,500

    He re-purchased this scheme and got Rs. 1,00,000. Calculate the holding period return and CAGR.
103. Seema is planning to invest a sum of Rs. 5,67,000 in a scheme for 4 years and expects an annualized return of 14%. Calculate the holding period return if her expectation is assumed to be true.
104. Suresh invested Rs. 90,000 in a fund and got 4 dividends in 4 years. He was able to sell this after 4 years for Rs. 1,26,000. Dividends are as follows:

    1st year Rs. 12,000

    2nd year Rs. 8,000

3rd year Rs. 7,500

4th year?

HPR is 77%. Find out the amount of the 4th year's dividend and CAGR.

105. Mr. Subhash invested Rs. 78,000 three years ago and got the following dividends:

1st year Rs. 6,700

2nd year Nil

3rd year Rs. 5,000

Compute the holding period return and compound annual growth rate (CAGR) if he got a capital appreciation of Rs. 13,000.

106. Mr. Mehra holds an investment for which he deposited Rs. 3,45,000 initially and received the following dividends during his holding period:

1st year Rs. 25,000

2nd year Rs. 20,000

3rd year Rs. 30,000

4th year Rs. 22,000

Holding period return is 39.71%. Calculate the amount of capital appreciation received by him if he got this return.

107. John's father has promised him that when John is 25 years old, he will give him a lump sum amount of Rs. 6,00,000 to start his life well. John is now 15 years old. His father wishes to save money every month at the beginning of every month, starting from now. Let us assume that he will be able to generate 12.90% p.a. on his investment. Calculate the amount he will have to save every month at the beginning of every month to meet this goal.

108. Mr. Mohit has to buy a 2-bedroom apartment which will cost him Rs. 24,75,000 inclusive of registration and stamp duty. He wishes to take a loan of such an amount that he will have to pay Rs. 15,000 per month as EMI. He wishes to pay back in 18 years and the rate of interest on the loan is 9.5% p.a. Calculate the amount of loan which he can take?

109. Mr. Mehta is 45 years old and is not keeping good health. He wishes to take voluntary retirement at age 50. The policy of his employer is such that the employee would get pension only after completion of 60 years of age. He has to make provision for a monthly annuity for 10 years starting at the beginning of his 51st year. The first monthly annuity should start from the first month of the 51st year and continue till the completion of 60 years. He will get a return of 12% p.a. on his investments. Compute the amount he should save at the end of every month to enable him to get an annuity of Rs. 7,800 p.m.

110. A hotel bought furniture worth Rs. 12,00,000 by making a down payment of Rs. 1,80,000 and the balance in 10 equal annual installments of Rs. 1,50,900 to be paid at the beginning of every year. Compute the rate of interest on the loan.
111. In the same question, if the loan installment of Rs. 40,000 has to be paid every quarter at the beginning of every quarter, find out the rate of interest on the loan.
112. An employee wishes to leave his organization and he has been given 2 options by the employer; either he can receive Rs. 24,00,000 now or, he can receive Rs. 26,500 p.m. for the next 25 years which is assumed to be life expectancy after retirement. You are sure to get a return of 12% p.a. Which option is better?
113. Mr. Sharma is 70 years old and wishes to get a pension for the next 15 years. He has an amount of Rs. 5,60,000 to invest now, which when invested at a rate of 9% p.a. will give an annual withdrawal for 15 years. Calculate the amount of withdrawal, if the first installment starts at the end of one year from now.
114. Sudhir is planning to save for his daughter's higher education. His daughter is 6 years old and will need a sum of Rs. 5,00,000 every year for 5 years after 12 years when she is in college. The first installment will be required at the beginning of the 13^{th} year. If savings provide a return of 11.65% p.a. how much should he invest now to meet his target?
115. Mr. Ramesh will retire next month. He works in a public sector bank where he will get a pension for life and his spouse will get half the pension after his death. The pension is index linked. He will get Rs. 13,500 as pension from his employer after commutation of 15 years pension. He is assuming his life expectancy to be 15 years after retirement. His monthly expenses are Rs. 22,000. He wishes to invest a lump sum amount now to enable him to get a monthly sum of the difference in the amount, every month at the beginning of the month for 15 years. The first installment of the pension should start immediately. Calculate the amount he should invest today, if the rate of return on investments is 9.75% p.a. convertible monthly.
116. Compute the present value of an income stream which gives a client Rs. 1,50,000 per year for the first 5 years and Rs. 1,80,000 per year for the next 4 years, if the rate of return on investments is 12.60% p.a.
117. In the previous question, if the income stream comes at the beginning of every year, calculate the present value of the same income stream if the rate of interest is also the same.
118. You have borrowed Rs. 2,80,000 from your friend and he has given you four options to pay back the money.

(1) Up front Rs. 25,000 and the balance in 4 annual installments of Rs. 80,000 each at the beginning of the year.

(2) Upfront 0 amount and 4 equal installments of Rs. 90,000 each at the end of the year.

(3) Upfront Rs. 50,000 and the balance in 4 equal installments of Rs. 68,000 each at the end of each year.

(4) Upfront Rs. 30,000 and the balance in 4 equal installments of Rs. 70,000 each at the beginning of each year.

Assuming that the money can be invested easily at a rate of interest of 8% per annum, which option is better from the point of view of the lender?

119. A person has to make the following payments at the end of the year to his brother to meet expenses towards irrigation of land.

1^{st} year Rs. 1,20,000

2^{nd} year Rs. 1,56,000

3^{rd} year Rs. 1,89,000

If return on investments is 8.80% p.a. how much should he invest now to enable him to provide the required amounts to his brother?

120. Shyam invested Rs. 1,20,000 in an investment and received the following cash flows.

BOX

Year 1	Rs. 18,000
Year 2	Rs. 15,600
Year 3	Rs. 19,700
Year 4	Rs. 18,500
Year 5	Rs. 1,27,000 (sale price + cash inflow)

If required return on such type of investments is 12% p.a. calculate the net present value of this investment. Is the investment worth investing in, or not?

121. Compare the two investments, A and B.

	Investment A	Investment B
	Rs.	Rs.
Initial investment	−1450000	−1500000
Cash Inflows		
Year 1	80000	95000
Year 2	95000	−

Year 3		–	150000
Year 4		156000	139000
Year 5		146000	89000
Year 5	Sale price	2550000	2760000

Applicable discount rate is 13% p.a. Compare the two investments with the help of the NPV method.

122. Raman invested an amount of Rs. 4,50,000 in a fund which provided him the following amount of dividends:

Year	Amount (Rs.)
1	48000
2	58000
3	72000
4	63000
5	58000
6	83000 (Profit)

Calculate NPV if the discount rate to be used is 12.5% p.a.

123. Mr. Raman retired recently and he has two options to select from as he requires a regular income after retirement, other than his pension income.

		Option A	Option B
Initial amount of Investment required (Rs.)		1000000	1000000
Cash Inflows expected			
1 year		125000	126000
2 year		135000	140000
3 year		128000	nil
4 year		.130000	148000
5 year		135000	nil
5 year	Sale proceeds	1250000	1585000

Discount rate is 12% p.a. Which option is better for his needs?

124. Rahul has to accumulate money to buy a car worth Rs. 5,60,000 after 4 years. He wishes to invest money at the beginning of every quarter for the first 3 years and he cannot save any more money after that. Calculate the amount of saving required every quarter if the rate of return on investments is 14.25% p.a.

125. Rama invested Rs. 4,35,000 in an investment which provided him the following cash flows:

Year 1	Rs. 45,000
Year 2	Rs. 53,000
Year 3	Rs. 56,000
Year 4	Rs. 1,20,000
Year 4	Rs. 5,00,000 (Sale price)

Compute the IRR for this investment.

ANSWERS TO PRACTICE QUESTIONS — 5

BOX

Sr. No.	*Rupees*
101.	HPR = 137500 – 125000/125000 × 100 = 10%, CAGR = 10%
102.	HPR = 56.976%, CAGR = 9.437% or 9.44%
103.	68.895%. Calculate FV and then calculate HPR
104.	Rs. 5,800 (dividend), CAGR = 15.34%
105.	31.67%, 9.60%
106.	Rs. 40,000
107.	Rs. 2,447 per month at the beginning of every month
108.	Rs. 15,49,728
109.	Amount of saving required to give him a monthly annuity for 10 years is Rs. 5,49,100. The amount of saving required is Rs. 6,723.
110.	10% p.a.
111.	2.56% quarterly and 10.24% p.a.
112.	PV of Rs. 24,00,000 is the same today. Present value of income stream of Rs. 26,500 p.m. for the next 25 years is Rs. 25,16,083. Therefore, the 2nd option is better
113.	Rs. 69,473
114.	1st step 500000 pmt, 5 *n*, 11.65% I, Comp PV = Rs. 20 29,9382nd step 2029938 FV, 12 *n*, 11.65% comp PV = Rs. 5,40,976
115.	He wishes to have a monthly annuity of Rs. 8,500 at the beginning of every month. 8500 pmt, 180 *n*, 9.75%/12 I, Type 1, Compute PV = Rs. 8,08,888
116.	Rs. 8,31,045
117.	Rs. 9,35,756

118.	1st option is better from the point of view of the lender. 1 PV = Rs. 3,11,167.75, 2 PV = Rs. 2,98,091.41 3 PV = Rs. 2,75,224.62, 4 PV = Rs. 2,80,396.78
119.	Rs. 3,88,828.34. Calculate the PV of all the 3 requirements
120.	NPV = Rs. 6,350 which is positive. The investment is worth investing in. NPV should be positive
121.	NPV for A is Rs. 94,928, NPV for B is Rs. 1,47,264. The 2nd investment is better
122.	Rs. 23,491
123.	NPV for A is Rs. 1,02,845, for B it is Rs. 1,21,174, but option B is not providing him with a regular inflow as required by him. Therefore, Option A is better although NPV is less
124.	Rs. 33,448 per quarter
125.	14.88% p.a.

PRACTICE QUESTIONS ON FINANCIAL MATHEMATICS — 6

126. Mr. Gupta has decided to plan for his retirement. He wishes to save a lump sum amount that will enable him to get an annual payment of Rs. 1,20,000 starting 10 years from now. The 1st payment of annuity will start from the end of the 11th year and will continue for 12 years. The rate of return on investments is 11.50% p.a. Compute the amount of money to be invested by Mr. Gupta now for this purpose?
127. In the previous case, if payment of annuity should start at the beginning of the 12th year instead of at the end of the 11th year, but the number of installments remains the same i.e.12, how much does Mr. Gupta have to invest in order to meet his target?
128. Compute the present value of an annuity which pays the annuity quarterly and starts paying after 5 years. The first quarterly payment of Rs. 2,500 will start one quarter after completion of 5 years and will continue for 4 years. The rate of return on investments is 12.70% p.a.
129. In the same question, if Rs. 2,500 is a monthly payment starting one month after completion of 5 years and the rate of return is the same, what amount should be invested now to accomplish this goal of monthly payments for 4 years?
130. Compute the present value of a monthly annuity which pays Rs. 2,500 p.m. at the beginning of every month after completion of 5 years from now. The rate of return on investments is 12.70% p.a. and the monthly payments will continue for 4 years.

131. What amount should be invested now to get Rs. 5,000 every quarter for 3 years and Rs. 4,000 per month for the next 4 years? The 1st payment is required after 12 years from now, i.e. it should start one quarter after completion of 12 years. A rate of return of 10% p.a. can be generated on the investments.
132. Mr. Sharma will be retiring from his profession. He is 65 years old and expects to live to 80 years. He therefore, has to provide a regular income of Rs. 20,000 per month for the next 15 years for himself and Rs. 12,000 per month for the next 6 years for his wife. He has invested a lot of money in bank FD's and recurring deposits and now wishes to consolidate all the money. He wishes to know from you how much should be invested for the purpose of a regular income for him and his wife thereafter? The rate of return is 8% p.a.
133. Mohan is 43 years old and wishes to re-finance his outstanding loan of Rs. 1,32,089. The rate of interest has come down from 12% to 8% p.a. He has also to pay 3% as closing costs which will be added to the loan amount. The loan is to be paid back in a maximum of 20 years through monthly installments. Mohan wishes to be free of any liabilities when he retires at age 60. Calculate the EMI for the loan.
134. If the interest rate is 9% p.a. calculate the doubling period with the Rule of 72.
135. If interest rate is 9% p.a. calculate the doubling period as per the Rule of 69.
136. Suppose you deposit Rs. 20,000 with an investment company which pays 16% interest and compounding is done quarterly. How much will the investment grow to after 5 years?
137. A finance company announces that it will give Rs. 1,50,000 at the end of 5 years to all investors who deposit Rs. 20,000 every year. Calculate the implied rate of return for an investor.
138. Mr. Gupta has been given two options by his employer:
    (1) An annual pension of Rs. 1,00,000 for as long as he lives
    (2) Lump sum amount of Rs. 5,00,000

    If Mr. Gupta expects to live another 15 years which option is better for him, if the interest rate is 12% p.a.
139. Soma deposits Rs. 1,50,000 in a bank deposit which pays 12% interest per annum. How much can she withdraw for the next 30 years so that the whole amount exhausts at the end of 30 years.
140. What is the present value of an income stream which provides Rs. 20,000 a year for the first 5 years and Rs. 30,000 a year forever thereafter? Assume a rate of return of 10%.

141. What amount must be deposited today in order to earn an annual income of Rs. 50,000 forever, beginning from the end of the 15^{th} year from now, if the rate of return is 12% p.a.?
142. You want to take a tour of Europe which costs Rs. 10,00,000. The cost will remain unchanged. You want to save Rs. 85,000 per annum for this goal. The rate of return is 14% p.a. How many years will it take for you to accumulate this amount?
143. Radha borrows Rs. 2,00,000 to buy various electronic items for his new home, at a monthly rate of return of 1.25%. The loan is to be repaid in 12 monthly installments at the end of every month. Calculate the monthly installment?
144. You have a choice between Rs. 50,000 now and Rs. 2,00,000 after 10 years. If opportunity cost is 12% per annum, which option should you select?
145. How much should be invested every month at the beginning of every month for 10 years in order to provide a sum of Rs. 5,00,000 at the end of 10 years? Rate of return is 16.20%.
146. A person requires Rs. 20,000 at the end of each year from 2006–2010. How much should he deposit at the end of each year from 1995–1999? The interest rate is 12% p.a.
147. A company borrows Rs. 6,00,000 at the rate of interest of 14% .The loan is to be repaid in 16 quarterly installments payable at the end of every quarter. Calculate the amount of the EMI.
148. A company has issued debentures worth Rs. 12,00,000 which have to be redeemed after 6 years. For this, a sinking fund has to be created in these 6 years. The rate of return on investments is 12% p.a. Compute the amount of the contribution to be made?
149. Somesh is currently drawing a salary of Rs. 6,00,000. He is expecting three promotions in his career. In the first promotion after 4 years, he expects a jump of 8% in his salary and in the second promotion after 9 years from now, he expects a jump of 10%. In the last promotion after 13 years from now, he expects a jump of 5% in his salary. Assuming that he gets all the promotions as indicated above, calculate the amount of the last salary drawn by him just before retirement?
150. A grandfather wishes that he should invest an amount which will pay his son an income of Rs. 2,40,000 every year and after his son, his grandson should also continue to get the same amount forever. If we assume that the rate of return is 9% throughout the period what amount should be invested by him today?

ANSWERS TO PRACTICE QUESTIONS — 6

BOX

Sr. No.	*Rupees*
126.	Rs. 2,56,190. Start from the end. 120000 pmt, 11.50 *i*, 12 *n*, Compute PV = Rs. 7,60,870. 760870 FV, 10 *n*, 11.50 I, Compute PV = 256190
127.	Rs. 2,56,190. End of 11th year or beginning of 12th year means the same but we will calculate like this: 120000 pmt, Beginning, 11.50 *i*, 12 *n*, Compute PV = Rs. 8,48,370. 848370 FV, 11 *n*, 11.50 *i* Compute PV = Rs. 2,56,190
128.	Rs. 17,043
129.	Rs. 51,541 (will grow to Rs. 93,707.23 and on investing further will generate Rs. 2,500 p.m.
130.	Rs. 52,086.57
131.	Rs. 54,097 (16342 + 37755)
132.	Rs. 23,08,568 (Rs. 20,92,812 is required for 1st payment of Rs. 20,000 p.m. for 15 years and Rs. 2,15,754 is required for 2nd payment)
133.	Rs. 1,222 p.m. (Outstanding loan will increase by 3% to Rs. 1,36,051.67 and the payment period is 17 years as he wishes to be debt free at retirement)
134.	8 years (Doubling period) = 72/9 = 8
135.	8.01 years (Doubling period) = 0.35 + 69/9 = 8.01 years
136.	Rs. 43,822.46
137.	20.39% p.a.
138.	Option a) is better as PV of cash inflows is Rs. 6,81,086
139.	Rs. 18,621.54
140.	Rs. 2,62,092 (PV of forever annuity or annuity in perpetuity is 30000/0.10, i.e. Rs. 3,00,000 at the end of 5 years from now, PV today is Rs. 1,86,276 and PV of income stream for first 5 years is Rs. 75,816
141.	Rs. 85,258.32
142.	7.43 years
143.	Rs. 18,051.66
144.	2nd option (PV in case of 2nd option is Rs. 64,395)
145.	1688.08

146.	Rs. 5,749.52 (The amount per annum will be invested every year for 5 years and after that it will grow for a further 5 years; after that it will start paying an annuity
147.	Rs. 49,610.89
148.	Rs. 1,47,870.86
149.	Rs. 7,48,440 (salary is increasing not every year but after a gap)
150.	Rs. 26,66,667

CHAPTER

4

Personal Financial Ratios

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- ❑ *The need to compute personal financial ratios*
- ❑ *Types of ratios*
- ❑ *Computation of net worth*

4.1 NEED TO COMPUTE PERSONAL FINANCIAL RATIOS

Investors analyze stock ratios such as price earning multiple, book value per share, dividend yield, earning per share, plough-back ratio, etc. in order to assess the financial health of a company. These ratios are commonly used by prospective investors to compare them with the benchmark ratios. To help their clients to progress towards achieving their financial goals, financial planners also need to assess the health of individual investments.

Just as stock ratios are based on the company's earnings, the personal financial ratios are based on an individual's income. The foundation for the ratios is that there is a fundamental relationship between income, savings and debt levels. One ratio will affect the other and investors need to have their finances in proper balance; hence the need for financial planners to prepare personal ratios and evaluate them.

Analysis of financial ratios will involve looking into several factors, as the adequate ratio will be different for each client depending on the following factors:

- Life cycle stage
- Wealth cycle stage
- Financial status of family
- State of economy

When a person is young and in the accumulation stage, he will have more debt as assets will be built by taking loans. When a person reaches the transition or reaping stage his debts will be paid off and his asset base will also be large.

Financial status of the family is also a major consideration while evaluating ratios. A person may earn Rs. 30,000 a month; another may be earning Rs. 1,00,000 per month or earning lakh of rupees through business income. Occupation and income levels will determine their ratios. A financial planner has to consider these factors while assessing financial statements.

The state of the economy is also to be considered while evaluating ratios. If the rate of inflation is low then even if the return is 9% per annum, the real return will be reasonable but in a high inflation phase a higher amount of return is required to beat inflation. If return is less than inflation then real return will be negative and there will be a decrease in the net worth instead of an increase, as shown by the return only.

4.2 TYPES OF RATIOS

- Savings to income
- Debt to income
- Savings rate to income
- Liquidity
- Debt
- Risk exposure
- Net worth

Savings to Income

The savings will include the current value of investments and will also include the amount accumulated in employee's provident fund account, i.e. contribution by the employee plus a matching contribution by the employer as well as the interest accumulated thereon. The current value of the home is not included in accumulated savings as it is required for living in. A person may include a certain percentage of the value of his home in his financial assets if he is likely to sell it after retirement and move to a smaller place.

Savings/Income ratio

Savings/income ratio = Current value of savings/current Income

For example, Mr. Saxena who is 38 years old works as an executive in a private sector bank. His investments (excluding home) are currently valued at is Rs. 12,00,000 and his annual salary income is Rs. 4,00,000.

The savings to income ratio will be: $\frac{1200000}{400000} = 3$

This means that the savings are three times the annual income.

To determine whether this ratio is adequate or not we will have to consider the age of the person. As a thumb rule, a 40-year old person should have accumulated investments worth three times his salary. Thus, this ratio is adequate for Mr. Saxena.

Debt to Income

The objective of this ratio is to help individuals to move from a situation of high debt and low savings to a situation of no debt and high savings as their age increases. This ratio will be higher at age 30 and lower or nil at age 60. As a person starts his career, he buys many items by taking a loan. Therefore the amount of loans will be higher in the beginning.

Debt to Income Ratio

Debt to income ratio = Current financial obligations/annual salary

Current financial obligations will include all outstanding loan amounts which include house loan, car loan, education loan, consumer loan and the outstanding balance in a credit card.

This ratio should be 1 for a 45-year old person and should continue to come down as age increases. For a young person of 28 or 29 years, this ratio will be higher.

For example, Mr. Vishal aged 30 years, works with a multinational company and earns a post tax salary of Rs. 4,25,000 per annum. Recently he has taken a housing loan of Rs. 12,00,000 and a car loan of Rs. 3,00,000. Calculate the debt/income ratio.

Debt to income ratio will be: $\frac{1500000}{425000} = 3.53.$

This ratio is adequate for a 30-year old person but this should keep decreasing as age increases.

Savings Rate to Income

Savings rate refers to the percentage of pre-tax income a person is able to save every year out of his total income.

Here, savings will not include dividend, bonus and interest income on his investments.

If he is saving the amount of income he gets on investments, that amount will be excluded while calculating the savings rate. As a rule of thumb, a person starting at age 30 should save 12–15% of his income every year. If he is not serious about savings in the initial stages then he will have to increase his savings rate later to cover the loss he has incurred by not saving early and in a disciplined manner.

Savings Rate/Income

Savings rate/income = Total annual saving/annual salary

For example, Mr. Sharma who is 42 years old earns a salary of Rs. 5,24,000 p.a.

His savings for the year 2005 were as follows:

PPF = Rs. 24,000

ELSS = Rs. 50,000

PF contribution = Rs. 22,500 (both employer and employee contribution)

Diversified equity = Rs. 15,000

Premium on term insurance

On a policy of Rs. 25 lakh = Rs. 5,000

Dividend amount reinvested = Rs. 2,400

Calculate the savings rate to income ratio.

SR/I = Savings/income

Savings = 24000 + 50000 + 22500 + 15000/524000 = 21.28%

We will not consider term insurance premium as investment as it will be taken as an expense because term insurance is only for protection and no part of the money goes towards investment.

Thus, he has saved a good amount of money in the year 2005.

Let us take one example to calculate these three ratios:

A 45-year old person has the following financial statistics:

Salary = Rs. 11, 00,000

Mortgage balance = Rs. 12, 50,000

Car loan balance = Rs. 2, 50,000

Investments = Rs. 30, 00,000

Annual savings = Rs. 1, 00,000

Employer contribution = Rs. 30,000

$$\text{Savings to earning ratio} = \frac{3000000}{1100000} = 2.727$$

$$\text{Debt to earning ratio} = \frac{1250000 + 250000}{1100000} = 1.36$$

$$\text{Savings rate to earning ratio} = \frac{100000 + 30000}{1100000} = 11.8\%$$

The financial planner can easily conclude that this client's savings are low, while debt is high. His current saving rate is appropriate but he will need to save more in the future in order to make up for the low savings now. He must also focus on paying down his debt.

Liquidity Ratios

Basic Liquidity Ratio

How many months will a client's money last for if all his sources of income stopped due to unexpected circumstances? In other words, has the client provided for some emergency cushion in a liquid form?

Basic liquidity ratio will determine how many month's expenses are provided for in the form of liquid money, i.e. cash or near-cash assets.

Basic liquidity ratio = Liquid assets/monthly expenses

Liquid assets will include cash at home, cash in a savings bank account and in a flexi deposit account and investments in money market mutual fund schemes. Direct equity holdings and equity schemes of mutual funds will not form liquid assets although these can also be converted into cash at a short notice.

Expenses will be the average monthly expenses and will include items such as rent, EMI, travel, school fees, groceries, etc. as well as an average of the periodic spend like insurance premium, annual charges of club, vacations, etc.

Financial planers will consider a Basic Liquidity Ratio (BLR) of 4–6 to be good. This ratio will vary across age groups and income categories.

- People with more stable incomes may need a lower ratio.
- Those having a large gap in income and expenses will need a lower ratio as compared to those with irregular incomes.
- An actor who earns a lump sum will require a higher basic liquidity ratio than a government servant who gets a regular salary income.
- A retired person may need to keep more amounts in liquid form.

Example:

	Liquid Assets	Expenses	
Cash at home	= Rs. 12,000	Monthly expenses	= Rs. 22,000
Savings a/c balance	= Rs. 15,000	Interest expenses	= Rs. 2,000
Flexi deposit a/c	= Rs. 25,000	Annual club fees	= Rs. 12,000
MMMF	= Rs. 50,000	Real estate taxes	= Rs. 4,800 p.a.
	Rs. 1,02,000		

Expenses will be 22000 + 2000 + 1000 + 400 = 25400

Basic liquidity ratio = $\frac{102000}{25400}$ = 4.01

Expanded Liquidity Ratio

For how many months can a person survive without getting a regular salary income if a person is not able to go to work for an extended period of time due to long periods of illness or accident and temporary disability?

Expanded liquidity ratio = Liquid assets + other financial assets/monthly expenses

Other financial assets include direct equity, investment in mutual funds, PPF, NSC, bank FD's, bonds, etc. Here, all assets which are not liquid or which may also give less than the amount invested will be taken at 50% of the value and bank FD's will be taken at 100% of the value.

For example, other financial assets are:

Fixed Assets		Equity Assets	
Bank FD	= Rs. 45,000	Direct Stocks	= Rs. 46,000
Bonds	= Rs. 50,000	Mutual Funds	= Rs. 68,000
	Rs. 95,000	Equity oriented balanced fund	= Rs. 24,000
			Rs. 1,38,000

Bank FD will be taken at the full value of Rs. 45,000 but all the other assets will be taken at 50% of the value as we will assume that when the investor needs money for emergencies he will not wait for the right time to sell his investments and convert them into cash. It is likely that he will encash his assets at the available price and to be on the conservative side we are assuming the value at 50%.

Expanded liquidity ratio = 102000 + 45000 + 50% (50000 + 138000)/25400 = 241000/25400 = 9.48

He has 9.48 months of provision to sustain his living standard if he is temporarily unable to earn on a regular basis.

Debt Ratios

Liquid Assets Coverage Ratio

This ratio will evaluate whether liquid assets are available to repay debt. Sometimes evaluation of this ratio by the financial planner will help the client to re-finance his debt or reduce the debt burden. Again, this ratio will depend on the age of the person as a young client in the accumulation phase will have a higher amount of debt.

Liquid assets coverage ratio = Liquid Assets/total debt

There is no such standard for this ratio as it will depend on age.

Example:

Housing Loan	= Rs. 12,00,000
Car Loan	= Rs. 3,50,000
Consumer Loan	= Rs. 25,000
	Rs. 15,75,000

$$\text{Liquid assets coverage ratio} = \frac{102000}{1575000} = .0647$$

Solvency Ratio

This ratio will examine the solvency of the client, i.e. whether assets are sufficient to repay debts.

Solvency ratio = Liquid and other financial assets/total debt

Here all the assets will be taken at full value (100% value) because if a person wishes to sell his assets to repay debts, he will wait for the appropriate time to sell these assets and would not like to suffer any loss. In case of extended liquidity ratio, we have taken investments other than bank FDs at 50% value because there it was an emergency situation.

Example: Continuing with the same information solvency ratio will be calculated as follows:

$$\text{Solvency ratio} = 102000 + 95000 + \frac{138000}{1575000} = \frac{335000}{1575000} = .2126$$

Solvency ratio has to be a minimum of 1. In this case, this ratio is not adequate.

Risk Exposure Ratios

This ratio takes care of the insurance needs of a client. It considers whether he has adequate amount of life insurance coverage and also property protection cover. It also considers whether he has provided adequately for his family and if the insurance cover and other assets will take care of the future financial needs of the family, in case something happens to the bread winner.

Life Insurance Coverage Ratio

Life insurance coverage ratio = Net worth plus death benefits of the principal wage earner/salary of principal wage earner

This ratio will determine how many years of salary he has provided for the family.

Net worth = Assets – liabilities

In the case of an individual the net worth will be the financial and physical assets minus any loans.

For example, Mr. Srinivasan has total assets worth Rs. 35,00,000 (including physical assets like real estate, gold, etc. and financial assets) and he has taken a housing loan of Rs. 12,00,000 and a car loan of Rs. 3,00,000. He also has a term insurance policy of Rs. 20,00,000. His annual salary is Rs. 4,20,000. Calculate the life insurance coverage ratio.

$$\begin{aligned}
\text{Net worth} &= \text{Assets} - \text{liabilities} \\
&= 3500000 - 1500000 \\
&= 2000000 \\
\text{Insurance cover} &= 2000000 \\
\text{Life insurance coverage ratio} &= 2000000 + \frac{2000000}{420000} \\
&= 9.52
\end{aligned}$$

The ratio of 9.52 indicates that he has provided for his family 9.52 years worth of expenses. This number will automatically increase as after the death of earning member, expenses of family will also come down.

Net Worth Ratios

This ratio will indicate the growth of the net worth. The client and the financial planner are both interested in knowing the growth of net worth as increase in the net worth will be a positive indicator towards achieving the financial goals of the client.

How to Compute Net Worth

The following information is available for Mr. Singh:

He is 56 years old and will retire in 2 years time. He gets a salary of Rs. 62,000 per. month net of taxes and his monthly expenses are Rs. 32,000.

His other investments are as follows:

	Rs.
Cash at bank	1,22,000
Fixed deposit maturity amount	7,50,000 (maturing this month)
RBI bonds	25,00,000 (present value)
Outstanding loan amount on house	4,00,000
Other liabilities	4,20,000
Mutual funds (equity)	10,25,000 (present value)
Balanced funds	5,20,000 (present value)

On his outstanding loan he pays an EMI of Rs. 18,000 p.m.

Calculate the net worth of Mr. Singh.

$$\begin{aligned}\text{Net worth} &= \text{Assets} - \text{liabilities}\\ &= 122000 + 750000 + 2500000 + 1025000\\ &\qquad + 520000 - 400000 - 420000\\ &= 4917000 - 820000\\ &= 4097000\end{aligned}$$

Net Worth Growth Ratio

Net worth growth ratio = Net increase in net worth/net worth at the beginning of the year

Example: Net worth at the beginning of the year was Rs. 35,50,000

Net worth at the end of the year was Rs. 38,00,000

$$\text{Net worth growth ratio} = \frac{250000}{3550000} = .07$$

This means that the net worth is growing at the rate of 7%. If inflation is 5% then net worth is growing only at a rate of 1.90%.

CHAPTER

5

Retirement Planning

LEARNING OBJECTIVES

After studying this chapter you will be able to understand

- ❑ *What is retirement planning?*
- ❑ *The need for retirement planning*
- ❑ *Why the need for retirement planning is increasing?*
- ❑ *Who needs retirement planning advice?*
- ❑ *Role of financial planners in making an efficient retirement plan*
- ❑ *How financial planning and retirement planning are interrelated?*
- ❑ *Steps to save for retirement planning*
- ❑ *Solved questions on retirement planning*

5.1 WHAT IS RETIREMENT PLANNING?

Retirement planning is an integral part of financial planning. It involves helping the client to accumulate enough funds by the time of retirement to enable him to get a regular flow of income for the rest of his life so that he can live comfortably without compromising on his standard of living, having taken into consideration the effect of inflation.

Retirement planning is a multidimensional field. It is not mere investment planning. In the days of the joint family system, families lived together and elderly parents were taken care of by children. They enjoyed a retired life looking after their grandchildren, telling them stories and helping them with their studies. These concepts are slowly changing due to many factors. Families are becoming nucleus. Children have to move out of the cities for jobs and

parents are not always in a position to move with them due to many compulsions. Sometimes children do not earn enough to support their parents financially as the cost of living is also increasing. Longevity has also increased due to improved medical facilities.

The financial planner will have to consider many factors while making a retirement plan for his clients:

- Employer provided pension and other retirement benefits like gratuity, PF, etc.
- Time horizon available to accumulate money
- Any reduction in the standard of living
- Emergency provisioning
- Health insurance required
- Any goals approaching after retirement like plans for tourism, etc.
- Any goal of leaving an estate for the next generation

Sometimes, a financial planner may not have to provide much towards the retirement plan if the employer provides a sufficient pension for the client. But slowly employer provided pension schemes will not be available for younger clients although older clients may continue to enjoy this for several years more. This has already started for central government employees joining after 1st January, 2004. They will not get a pension in the form of a defined benefit plan; it will be a defined contribution plan.

With the passing of the PFRDA bill, the process of investment of contributed money both by employers and employees will start. A financial planner will also have to consider other funds available at the time of retirement as well as the gratuity and EPF amount available at the time of retirement.

If the time horizon for accumulating money is long, i.e. the client has started retirement planning at an early stage he will have to save a smaller amount every month in order to achieve his goal of funding for retirement. For example, two persons require Rs. 50, 00,000 each at the time of their retirement at age 60.

Person A starts saving at the age of 25 and will have to save Rs. 778 every month for 35 years if the average rate of return is assumed to be 12% in order to accumulate Rs. 50 lakh at age 60.

Person B starts saving at the age of 35 and will have to save Rs. 2,662 every month for 25 years at the rate of return of 12% per annum to make the corpus 50 lakh.

Normally, after retirement a person does not require 100% of what he used to spend before retirement. He needs only 50–75% of the last spend. But sometimes the client may like to have the same amount as annual living expenses as he may wish to spend on luxuries after retirement.

Regarding emergency provisioning a young client will require only 4–6 months of expenses as emergency funding but a retired client may require more,

say 12–14 months of expenses. His investments should also be easily convertible into cash.

Health insurance is a very important requirement after retirement. Sometimes the employer reimburses all the medical expenses even after retirement. Employees and their dependants are issued cards and they can get treatment in any of the empanelled hospitals; this is called cashless treatment. For this, they may have to pay a lump sum amount to their employer and they are then free of medical worries. However, all employers do not provide this facility. Financial planners have to consider all these factors.

Your client may like to go for a world tour after retirement, every 5 years. Although this goal will be provided for in the same way as other financial goals, a financial planner will have to help the client accumulate sufficient funds for this. While providing for this type of goal the financial planner will also have to consider the effect of inflation on cost. The cost will increase every year at the rate of inflation.

Your client may wish to leave an estate for the next generation. After providing for retirement the amount to be saved for estate building should be invested in those instruments which are inflation beating and after considering the age of the beneficiaries.

5.2 WHAT IS THE NEED FOR RETIREMENT PLANNING?

Why should you plan for retirement? The only way we have to answer that question is by countering it with another one—why shouldn't you plan for retirement?

There are some important reasons to plan for retirement.

Every person has a need to plan for his own retirement because of the following reasons.

Inflation Inflation diminishes the purchasing power of money; so that over a period of time you will have to pay more money for the same goods. While we may complain about rising prices, we are in a position to afford the goods and services we need while we are able and earning. Will we still be able to pay for them when we have retired and stopped earning? The simple answer is "yes", if we plan for our retirement properly.

Rising cost of medical services This is another reason. At that age, people need medical attention and as the years go by, it becomes a challenge to provide for rising medical costs. As life expectancy increases rising medical costs appear even more daunting. A lot of uncertainty is removed if one plans for this properly.

Breakdown of joint family system The joint family system used to provide financial security for a retired person; this is gradually breaking down. Most elderly people have to live independently on their own and hence the need for retirement planning. Therefore, financial independence becomes critical.

Increase in longevity Life expectancy is increasing thanks to medical advancement. Most diseases are diagnosed in time and treatment is available; the only requirement is provision of enough money for this. Hence, there arises the need for proper planning with the help of a financial planner who does comprehensive financial planning.

No social security available from government There is no social security available for the old generation in India. Therefore, every individual has to start saving for the years when he stops working and will require a regular monthly income to maintain his standard of living.

Change in life style Change in life style has made life expensive and complicated. Having a car, a house in a decent location, a computer and television is no longer a luxury; rather these are necessities.

5.3 WHY THE NEED FOR RETIREMENT PLANNING IS INCREASING

The need for retirement planning is increasing as retired people can no longer depend on their children for their financial needs. The word "retirement" normally conjures up images of an elderly couple walking happily in a park or an old person relaxing in a rocking chair reading a newspaper. To make these images a reality requires a lot of thought, and planning one's finances during one's employment days.

A person starts working between 25–30 years of age and retires at age 60. During this span of 30–35 years of working life, he has to spend for monthly household expenses and also to save for the various goals which will arise at different phases of his life, including providing for his own retirement. This post-retirement period may be as long as 30 or 40 years. In this phase he will not be earning but only spending the money accumulated by him during his working years.

Retirement planning continues to be an alien concept for most individuals. There is much more to retirement than just lazing in an armchair or taking morning walks. A prerequisite for a comfortable retired life is detailed planning. You need to set goals, make investments and assiduously work towards achieving those goals.

There is therefore, a need to plan prudently throughout one's earning phase in life to meet these various goals as well as for retirement. Retirement planning should start from an early age so that individuals have to spare a small amount every month which will grow to a large sum because of the power of compounding. Investing a small amount every month through a systematic investment plan helps a person to take advantage of rupee cost averaging and the power of compounding.

By having a good retirement plan one can even think of retiring earlier than the specified retirement age. For this, individuals have to be cautious about wealth creation through various avenues of investment. Depending upon the time horizon and financial goals, investors have to choose from various avenues like bank fixed deposits, equity stocks, bonds, debentures, gold, insurance products, various schemes of mutual funds, small saving schemes, real estate, etc.

Investments should be selected carefully after studying past performances and comparisons with benchmarks. Investments once made should be monitored regularly and should be re-balanced if required. One should retain good funds and asset allocation should also be carefully considered while distributing assets among the various asset classes.

5.4 WHO NEEDS RETIREMENT PLANNING ADVICE?

Retirement planning is an essential element of any financial plan. It is a comprehensive process of determining how much money you will need when you retire and also helps you identify the best ways to save for retirement given your financial situation.

Retirement planning is the need of every individual whether he is a salaried person, a businessman or a professional.

Most people think retirement planning is only important when they retire. However, proper planning requires a much longer period of time—from the day you start working until well beyond your actual retirement date. In fact, it is never too early to start planning for retirement.

At age 65, the average man will live almost 20 years more, while the average woman will live another 22 years. We will probably spend 25 to 30 percent of our life in retirement, requiring vast sums of money to support ourselves.

In India, many of us put off retirement planning because we are too busy trying to meet our immediate financial needs to think about what will happen 20 or 30 years hence.

It is easy to understand why meeting our monthly bills seem more important, especially if our retirement is still far off. But here's something to think about: As we move through life, we will experience many events that will affect our future financial security such as getting married, starting a family, purchasing a home, and educating our children, etc. Each of these will affect our ability to plan for our future financial security. If we develop a flexible long term plan we can overcome these obstacles and ensure financial independence in our retirement years.

It is always better to prioritize the goals so that your resources will be allocated to the most important goal first. By assigning a priority to each goal, you also ensure that secondary goals do not take precedence over primary goals.

In this process, it is important to understand your needs. To determine the appropriate percentage towards the retirement plan, you need to determine if any of your current expenses will change when you retire. Will your travel and leisure expenditures increase? Will your job-related expenses for commuting and clothing change? Will you have to pay more towards medical costs? It is generally accepted that many of the routine annual expenses will change after retirement. The trick is determining whether these expenses will increase or decrease, and by how much.

Both living expenses and inflation are important in understanding your retirement needs because you are planning for a period of time, not a point in time.

Review Progress

Once you develop your plan, the process is dynamic. As you revise and prioritize your projected goals, you may see changes in your estimated income needs, projected resources and other assumptions. It is a good idea to review your action plan regularly and if necessary, make changes to make sure that it still meets your needs.

Finally, a successful retirement plan requires your active involvement and long-term commitment

5.5 ROLE OF FINANCIAL PLANNERS IN MAKING EFFICIENT RETIREMENT PLANS

How can a financial planner help in making retirement plans more efficient?

Retirement is different things to different people. For those in their 20s, it is a distant dream; for those in their 30s and 40s, it is a minor concern, and for those 50 and beyond, it is a reality that must be dealt with. No matter what your age, you should start to prepare for your retirement and the sooner the better.

When a person is nearing retirement, he knows about achievement of various goals. Most financial goals have either already been achieved or one or two goals may be approaching. Hopefully, he has accumulated some assets to help him in the retirement years. He knows how much will remain for the goal of retirement after meeting all the other goals.

When planning for retirement, you will want to crunch some numbers just to be sure you will have enough money to reach your retirement goals. A financial planner will help individuals to calculate the amount required to save every month from now on, to reach the goal of having a comfortable life after retirement without having to make any sacrifices. He will be aware of the following before calculating the amount that must be saved towards retirement planning.

	Rs.
Income per year	XXXXXXX
Expenses per year	XXXXX
Age today	XX years
Retirement age	XX years
Expected return on investment up to retirement	XX % p.a.
Expected return on investment after retirement	XX% p.a.
Assumed average inflation rate	XX% p.a.
Assumed life expectancy for both the partners	XX and XX years

Let us take an example to understand how a financial planner will help his client to make an efficient retirement plan.

Mr. Rohan, who is 30 years old has approached a financial planner for analysis of his retirement needs and wishes to start saving now towards this goal. He will retire at age 55. Life expectancy is assumed to be 75 years. Present annual expenses are Rs. 3,00,000 and he wishes to maintain the same standard of living after retirement. The rate of return expected on investments is 12% per annum and the average inflation rate is assumed to be 5.5% per annum throughout the phase. How much does he need to save every month in order to maintain the same standard of living even after retirement?

This question will be answered in three steps.

Step 1 is to calculate the amount of the annual expenses at age 55. This will be done using the inflation rate as *I*, as expenses increase at the rate of inflation

–300000 = PV

5.5 = *i*

25 = *n*

Compute FV = Rs. 11,44,018

How this calculation has to be done has been explained earlier in the book. The use of Excel sheet to do such a calculation has also been explained.

N = 25 as he is 30 years old and would retire at age 55.

Step 2 is to calculate the amount of accumulated savings that Mr. Rohan should have at age 55 to enable him to get an annual payment of Rs. 11,44,018 at the beginning of every year for 20 years, i.e. up to age 75.

1144018 = Pmt

Bgn

20 = *n*

6.16 = *i*

Compute PV = Rs. 1,37,50,953

(Rate here will be real rate of return, i.e. return adjusted for inflation $= (1+i/1+e) - 1 \times 100$

I = rate of return on investments and e = inflation rate) because he will have to face inflation even after retirement.

Step 3 is to compute the amount to be saved each month in order to accumulate the required amount of Rs. 1,37,50,953 (nest egg) to achieve the goal of retirement planning.

13750953 = FV

12/12 = i

25 × 12 = n

Compute Pmt = Rs. 7,318.83 (7,319)

Mr. Rohan has started investing money at age 30 and therefore he has to save Rs. 7,319 per month towards his retirement goal. Had he started planning 5 years earlier, he would have had to save a smaller amount each month. Therefore, retirement planning is the need of everyone and one should start planning for retirement from the time one starts working.

In this case, we have taken a conservative assumption of 12% per annum return only. The return may be more than 12% in some years and the average return may therefore, be much more than that. If the return is more than the assumed return or expected return, the person may have to save less for this goal or if he is able to save this amount he will be left with more money which can be used to have a more comfortable life or to leave an estate for the next generation.

While planning for retirement, the financial planner will recommend those avenues of investment which give a return much above the rate of inflation and thus help in growing wealth faster. He will recommend those products which are diversified into various asset classes and various sectors and he will consider the risk appetite of the client before doing so.

The best course to guarantee a steady growth in the retirement nest egg is to diversify investments. In other words, one should not put all the eggs in one basket. The easiest way of doing this is to spread money over several investment tools. The various products available for saving for retirement and withdrawing money regularly after retirement are discussed in the forthcoming pages.

5.6 HOW ARE FINANCIAL PLANNING AND RETIREMENT PLANNING INTERRELATED?

Retirement planning is an integral part of financial planning. Financial planning involves identifying the various financial goals of individuals, prioritizing them and converting them into monetary terms, and helping the individuals to achieve these goals. The role of the financial planner is to make available to his clients the right amount of money at the right time. For this, the planner has to study the income, expenses (make a budget), risk appetite and time horizon and recommend suitable products which meet the client's goals. The job is not over after the suitable investments have been made; the investments have to be

monitored and performance evaluated in order to check whether the investments are performing well and are on the way to achieving the goals.

The younger the person is, the better are the prospects of building a large corpus for the sunset years, since one can benefit more from the power of compounding.

Money starts earning interest and the interest earned also starts earning interest, translating to a good sized nest egg.

For example, let us assume that a 25 year old person starts saving Rs. 2,000 per month for 10 years and stops saving after that. When he stops saving, the accumulated amount will keep growing. Let us take here a very conservative estimate of return of 10% p.a. The amount of Rs. 2,000 saved every month for 10 years will accumulate to Rs. 4,09,690, which will keep growing for the next 25 years (till retirement at age 60). The retirement corpus will be a good amount of Rs. 44.39 lakh.

Another person aged 35 starts saving the same amount of Rs. 2,000 every month. He also saves for 10 years till he is 45 years and then stops saving and lets the money grow for 15 years till he retires at age 60. Let us assume here also that the return is 10% p.a. How much will be his nest egg at age 60?

The amount of Rs. 2,000 saved every month for 10 years will accumulate to Rs. 4,09,690 and will keep growing for 15 years. The retirement corpus will become Rs. 17.11 lakh only.

Inference If a person starts saving at a later date or when he is older, not only will he have to save much more every month, but also for a much longer duration in order to accumulate the same corpus.

Inflation erodes the purchasing power of a rupee. If you have bought something for Rs. 1,000 today, it will cost Rs. 1,060 next year, if the rate of inflation is at 6 percent.

You should be concerned about this.

If you are 30 and your expenses are Rs. 20,000 a month, and if the inflation is a steady 6 percent, then when you retire at 60, your expenses will be about Rs. 1,20,451 a month just to maintain your current standard of living. Expenses increase at the rate of inflation and therefore, inflation is a very big concern for retirement planning. Although a person needs only 50–75% of the last spend (before retirement) after retirement, it depends on the individual. Some people do not wish to compromise on their standard of living.

Retirement planning is a specialist job. There are many complex issues which a financial planner has to consider while making a retirement plan for clients. There are a few questions which a person should answer before a financial planner starts planning for the retirement goal.

- How much will I need for my retirement in order to live comfortably?
- What are my goals?

- When should I start saving money for this goal?
- What should I do to accumulate XXXX sum for retirement?
- If I am not able to save the required amount every month as calculated by the financial planner, should I increase my risk appetite since the time horizon is long?
- If I do not wish to increase my risk appetite, should I start earning more to meet this goal?
- Which expenses are likely to increase after retirement? Should I give thought to that now?
- What if I wish to leave an estate for my children? Should I start saving for that goal separately?
- How can my retirement plan become tax efficient?

These are the issues which will be dealt with by a financial planner very comfortably as he is a specialist in retirement planning, investment planning, insurance planning, and taxation and estate planning.

Everyone wishes to have a comfortable retired life but without adequate planning it probably will not happen. People are living longer than ever before thanks to advancements in medical science, but that means that retirement is becoming more expensive. Consider this: only 11% of the working population in India has any form of social security for old age.

One should start taking steps that will put one on the road to retirement planning. These are as follows.

Step 1: Start early, and retire peacefully

One should never delay in planning for one's retirement. Start as early as possible. Make a list of your financial goals and what you own so that you know the gap between the reality and your dreams. When one is young, the risk-taking capacity is high and time horizon is long. Earning well and then generating as high a rate of return as possible is top of the agenda.

For example, start saving for retirement at age 25 so that even if you wish to retire by 60 you have an investment horizon of 35 years. The longer the investment horizon the longer you can save and benefit from the power of compounding. If at the age of 25, you start investing Rs. 1,000 per month at the rate of 6% compounding, then the maturity amount (when you are 60 years of age) will be Rs. 14,24,710. Alternatively, if you commence the same investment at the age of 35, then the maturity value at the age of 60 will be Rs. 6,92,994. With a 10 year lag, the retirement savings at 60 years is more than halved!

Let us take one more example: At age 25, Rahul starts investing Rs. 2000 per month at the end of every month for the purpose of his retirement nest egg. This money is invested at an average return of 15% p.a. He will get Rs. 2,93,54,360 at age 60. Sohail starts saving Rs. 5,000 per month at age 35 and he also invests the money at a rate of interest of 15% p.a. He will get

Rs. 1,62,17,648 at age 60, i.e. even saving Rs. 5,000 per month will not make his the nest egg the same. It is Rs. 1.31 crore less than the amount accumulated by Rahul. A difference of 10 years has made a lot of difference in spite of the fact that Sohail has started savings 2.5 times more than Rahul.

Step 2: Have a concrete plan

One should assess his income and expenditure and make provisions for contingencies for example, set aside some money for travel and medical expenditure post-retirement. One should make a list of things he owns and those that one wishes to own, e.g. a car or house. One should try to cut down on the trivial expenditures and allocate resources towards necessary ends like children's education and marriage that one will incur in the course of time.

Step 3: Consult a financial planner/financial advisor

If one is not in a position to make a workable plan it is best to consult a financial advisor who will help to develop a financial plan.

In developing a financial plan, your planner/advisor would ideally present a number of alternatives to realize your goals. Analyze these options from the retirement perspective, e.g. there should be some exposure to equity over a longer horizon even if you are a risk-averse investor. Remember, your aim is to make decisions that will be most effective in helping you to realize your future financial goals, based on your current personal financial situation.

Step 4: Monitor the investments and review the plan

The financial plan needs to be monitored at regular intervals to make sure you are on the right path towards meeting your objectives. You could do this on your own or take assistance from your financial planner/advisor. Make sure the plan meets your investment objectives in the changing market scenario and try to understand the risk associated with every investment, and the liquidity of your investments. For instance, as you approach retirement age you should consider transferring money from equity to debt, as you would have lower risk tolerance when you move towards retirement.

In the early stages of one's life one should put more money in equity than in debt. As a rule of thumb, the debt percentage in one's portfolio should be equal to one's age. For example, a 30 year old person should put 30% of the total invested amount in debt instruments and 70% in equity. Asset allocation will depend on many other factors also such as income, number of dependants, and temperament and time horizon for various goals.

As a person grows in age he should continue to monitor his asset allocation and ensure that it is adequately divided between various asset classes. As he approaches retirement he should consider putting more money into debt instruments and start withdrawing from equity so that the debt percentage equals his age.

A retired client should not keep all his investments in debt instruments only. Debt gives stability to the portfolio and equity gives growth. Equity has inflation beating prowess.

Step 5: Do not dip into your retirement savings

One should not touch the pool of savings before retirement. If you spend money from your retirement kitty to fulfill your present needs, you will lose out in a big way in the long run. The corpus for your retirement will be much lower. Planning for retirement is not a difficult task; the challenge lies in implementing the plan with discipline.

Let us understand how to compute the amount required every month after retirement. As we know, the cost or expenses increase with the rate of inflation and amount invested grows at the rate of return on investments. Let us take a few examples to calculate this.

1. Mr. Pranav is 25 years old and works as a marketing manager in a private sector telecom company drawing a salary of Rs. 20,000 per month. He spends Rs. 12,000 per month. He wishes to know how much amount he will spend per month after 10 years if the rate of inflation is 6% per annum and he wishes to maintain the same standard of living.

This question can be solved with the help of a financial calculator or Excel sheet. Use of excel worksheets has been explained earlier.

Solution:

–12000 = PV
10 × 12 = *N*
6/12 = *I*
Compute FV = 21833

PV = present value, FV = future value, *N* = number of periods, *I* = rate of inflation

2. A retired couple estimate that they may live another 20 years after retirement and would like to have an annual income of Rs. 2,40,000. If the rate of return on investments is assumed to be 8% per annum, what amount of should they have at retirement to provide for their needs?

In this question we have to find the amount of accumulated savings that will be available with the couple at the time of retirement, so that they can withdraw Rs. 2,40,000 at the beginning of every year, for the next 20 years. Therefore, we have to find the PV of this income stream.

Solution:

240000 Pmt
Bgn
8 = *I*

20 = *N*

Compute PV = 2544864

If the couple invests Rs. 25,44,864 in a fund which generates 8% return and withdraw Rs. 2,40,000 at the beginning of every year for 20 years, the amount will be exhausted.

3. Ritika aged 25 spends Rs. 1,80,000 to maintain her life style. She expects her living expenses to increase by 2% every year until her retirement at age 55. The average inflation rate is assumed to be 5% throughout the phase of 30 years. What amount will be required by her at age 55 to maintain the standard expected by her?

In this case, the standard of living is also increasing by 2% in addition to inflation. Therefore, expenses will increase at a rate of 7% (2% + 5%) every year.

Solution:

180000 = PV

7 = *I*

30 = *N*

Compute FV = Rs. 13,70,206

4. In question 3, if Ritika feels that her standard of living during retirement will be only 75% of the last year's expenses, what will be the amount required at age 55, 60, 65 and 70, if the rate of inflation is assumed to be 5% after retirement?

Solution:

At age 55. The required amount will be 75% of last year's expenses, i.e. 75% of Rs. 13,70,206 = Rs. 10,27,654

At age 60. The required amount will increase only at the rate of inflation, which is 5% per annum.

1027654 = PV

5 = *I*

5 = *N*

Compute FV = Rs. 13,11,576

At age 65. The required amount will increase at the rate of inflation only.

1311576 = PV

5 = *I*

5 = *N*

Compute FV = Rs. 16,73,940

At age 70. The required amount will also increase at the rate of inflation, i.e. 5% p.a.

1673940 = PV
5 = *I*
5 = *N*
Compute FV = Rs. 21 36,419

5. In the previous case, if it is assumed that there will not be any impact of inflation after retirement then how much will Ritika require at age 55, 60, 65 and 70?

Solution: As we have calculated, the required amount at age 55 will be Rs. 10,27,654. The same amount will be required at every age as there is no impact of inflation after retirement.

6. Mr. Mehta spends Rs. 2,00,000 every year as annual living expenses. He is 32 years old. He has approached you for making his retirement plan. He does not want to compromise on his standard of living after retirement. He wishes to retire at age 50. Average rate of inflation in the first 5 years is 5% per annum, in the next 5 years it is 5.5% per annum and in the next 8 years it is 5.8% p.a. What amount will be required every year after retirement?

Solution:

Step 1

200000 = PV
5 = *I*
5 = *N*
Compute FV = Rs. 255256

Step 2

255256 = PV
5.5 = *I*
5 = *N*
Compute FV = Rs. 3,33,609

Step 3

333609 = PV
5.8 = *I*
8 = *N*
Compute FV = Rs. 5,23,749

After 18 years when he retires he will require Rs. 5,23,749 per annum to sustain the same standard of living.

7. Mr. Raman aged 40 currently spends Rs. 1,80,000 per annum. to maintain his family's living standard. His future is bright and he expects these expenses to grow by 3% over inflation each year till retirement and feels that his expenses

during the retirement period will be 90% of his last year's expenses. The current rate of inflation is 4% per annum. Calculate the amount that he will require for his expenses at age 60.

Solution:

180000 = PV
7 = *I*
20 = *N*
Compute FV = 696543
Expenses at retirement = 90% of Rs. 6,86,543
= Rs. 6,26,889

8. Ramesh is 35 years old and started a program of depositing Rs. 40,000 at the beginning of every year in a deferred annuity scheme as part of his retirement plan. How much amount will he accumulate for his retirement needs? The rate of return on investments is 9.5% p.a. and the rate of inflation is 5.5% p.a. He will retire at age 55.

Solution: In this question we have to calculate the accumulated amount available at retirement.

40000 = Pmt
Bgn
9.5 = I
20 = N
Compute FV = Rs. 23,70,554

Important: The amount invested will increase with the rate of return and expenses will increase with the rate of inflation.

9: In question 8, if Ramesh is not able to save money after 15 years and he invests the accumulated money at a rate of 12% per annum, how much will he accumulate at retirement?

Solution: In this case he is not able to save any money after saving Rs. 40,000 every year and the money will grow at a rate of 12% p.a. instead of 9.5%.

40000 = Pmt
Bgn
15 = *N*
9.5 = *I*
Compute FV = Rs. 13,37,662

This money will grow at the rate of 12% per annum for the remaining 5 years and will become:

1337662 = PV

5 = N

12 = I

Compute FV = Rs. 23,57,417

Since Ramesh was not able to save money in the last 5 years before retirement, he invested the accumulated amount at a higher rate of return.

10. Mr. Anand aged 30 met a financial planner for retirement planning and was told that if he saves Rs. 2,500 every month for 30 years (he will retire at age 60), he will be able to accumulate sufficient money for his retirement needs. The average rate of return will be 12% per annum, convertible monthly. What amount is sufficient for his retirement?

Solution:

2500 = Pmt

30 × 12 = N

12/12 = I

Compute FV = Rs. 87,37,410.33

According to the financial planner's calculation, the required amount for retirement is Rs. 87,37,410.

11. In case 10, if Ramesh plans to retire 5 years earlier, how much will he have to increase his savings in order to accumulate the same amount for his retirement?

Solution: He now wishes to accumulate the same amount in 25 years instead of 30 years.

8737410 = FV

25 × 12 = N

12/12 = I

Compute Pmt = Rs. 4,650.41

He has to increase his savings in order to retire early. In place of Rs. 2,500 per month he has to save Rs. 4,650 every month to accumulate the same amount. The increase in monthly saving is Rs. 2,150

12. Ten years ago Sunil invested Rs. 5,00,000 in an account yielding 12% per annum, compounded monthly. On the same day Sumit also invested the same amount into an account yielding 12% p.a. What is the amount that will be received by each of them and how much they can withdraw per annum for the next 10 years?

Solution: **Accumulated amounts**

Sunil	Sumit
500000 = PV	500000 = PV
10 × 12 = N	10 = N

12/12 = *I*	12 = *I*
Compute FV = Rs. 16,50,193.45	Compute FV = Rs. 15,52,924.10

Amount of Withdrawal

Sunil	Sumit
1650193.45 = PV	1552924.10 = PV
10 = *N*	10 = *N*
12 = *I*	12 = *I*
Compute Pmt = Rs. 292058	Compute Pmt = Rs. 274843

13. Mr. Gupta is 45 years old and will retire in 15 years. He has calculated that after retirement he will require Rs. 2,20,000 per annum at the beginning of every year for the next 20 years. The rate of return on investments before retirement is 14% per annum, convertible monthly and after retirement it is 9% p.a. How much he will have to save every month to meet this goal of funding for retirement?

Solution: This question will be answered in two steps. In the first step we have to determine the accumulated amount at age 60, which when invested further will provide an annual income of Rs. 2,20,000 p.a. at the beginning of every year for 20 years, i.e. we have to compute the present value of the income stream.

220000	= Pmt
	Bgn
20	= *N*
9	= *I*

Compute PV = Rs. 21,89,025

If he invests Rs. 21,89,025 in a scheme which provides 9% return per annum, he can withdraw Rs. 2,20,000 at the beginning of every year, for 20 years.

The second step is to calculate the amount to be saved every month in order to accumulate Rs. 21,89,025 for the retirement corpus.

2189025	= FV
15 × 12	= *N*
14/12	= *I*

Compute Pmt = Rs. 3,613.53

He will have to save Rs. 3,614 every month to accumulate the required amount. Had he started saving early, he would have had to save a lesser amount every month.

14. Ms. Rekha is 28 years old and single. She has no plans to marry and wishes to retire at age 50 and do some social service after that. She has recently

purchased a two bed room apartment, partly with a loan amount and partly with her own money. She has assumed her life expectancy to be 75 years and currently spends Rs. 12,000 per month. Inflation is assumed to be 4.5% per annum up to retirement and there is no inflation after retirement (assumption). How much will she require every month after retirement to maintain the same standard of living?

Solution: In this case we have to calculate the amount required every month after retirement to maintain the same standard of living.

–12000 = PV

22 × 12 = *N*

4.5/12 = *I*

Compute FV = Rs. 32,235

She will require Rs. 32,235 every month to maintain the same standard after retirement.

15. In question 14, what is the amount she will require at age 60 if inflation is 3.5% after retirement and she will need only 75% of what she was spending before retirement?

Solution: In this case she requires only 75% of the last expense, i.e.75% of Rs. 32,235 = Rs. 24,176. Now, this amount will increase with the rate of inflation for 10 years.

–24176 = PV

10 × 12 = *N*

3.5/12 = *I*

Compute FV = Rs. 34,289.90

She will require Rs. 34,290 after retirement every month if she requires only 75% of the last spend.

Important. Every person has to face the impact of inflation whether he is young, middle aged or a retired person. In questions when we are assuming no inflation after retirement, we are just taking examples for the purpose of practising different types of questions which may be asked in an exam.

A person has recently joined service at a salary of Rs. 18,000 per month. He is 23 years old and wishes to put Rs. 10,000 in a fund at the beginning of the first year and increase this investment by Rs. 1,000 every year for 32 years. This investment is towards his retirement planning. He is a moderate risk taker and invests money in equities which will generate an average return of 12% p.a. How much he will get when he is 55?

This can be solved with the help of an Excel sheet calculated as follows.

BOX

Year	*Amount*	*Return factor*	*No. of years*	*FV*
1	10000	1.12	32	375817.26
2	11000	1.12	31	369106.24
3	12000	1.12	30	359519.07
4	13000	1.12	29	347749.1
5	14000	1.12	28	334374.13
6	15000	1.12	27	319873.21
7	16000	1.12	26	304641.15
8	17000	1.12	25	289001.09
9	18000	1.12	24	273215.32
10	19000	1.12	23	257494.6
11	20000	1.12	22	242006.2
12	21000	1.12	21	226880.81
13	22000	1.12	20	212218.45
14	23000	1.12	19	198093.52
15	24000	1.12	18	184559.18
16	25000	1.12	17	171651.02
17	26000	1.12	16	159390.23
18	27000	1.12	15	147786.28
19	28000	1.12	14	136839.14
20	29000	1.12	13	126541.3
21	30000	1.12	12	116879.28
22	31000	1.12	11	107835.05
23	32000	1.12	10	99387.143
24	33000	1.12	9	91511.599
25	34000	1.12	8	84182.748
26	35000	1.12	7	77373.849
27	36000	1.12	6	71057.617
28	37000	1.12	5	65206.642
29	38000	1.12	4	59793.736
30	39000	1.12	3	54792.192
31	40000	1.12	2	50176
32	41000	1.12	1	45920
				5960873.2

FV = PV × 1.12^32 = FV for the first installment. We need to do this calculation only for two columns and then just drag down. The formula will be copied in all the cells and there is the solution, Rs. 59,60,873. By saving Rs. 10,000 in the first year and increasing the amount by just Rs. 1,000 will aggregate to approximately Rs. 60 lakh. In this question we have assumed the rate of return at 12% throughout. But actually, returns may be different in different years. Only by changing the return factor in the same Excel sheet, will it automatically calculate the accumulated amount. It can be seen that different returns are taken here but without doing any re-calculation in Excel. Only the rate of return factor was changed and Excel itself calculates everything.

BOX

Year	*Amount*	*Return factor*	*No. of years*	*FV*
1	10000	1.12	32	375817.26
2	11000	1.12	31	369106.24
3	12000	1.12	30	359519.07
4	13000	1.12	29	347749.1
5	14000	1.12	28	334374.13
6	15000	1.12	27	319873.21
7	16000	1.12	26	304641.15
8	17000	1.12	25	289001.09
9	18000	1.12	24	273215.32
10	19000	1.12	23	257494.6
11	20000	1.14	22	357220.79
12	21000	1.14	21	329019.15
13	22000	1.14	20	302356.78
14	23000	1.15	19	327330.75
15	24000	1.15	18	297010.89
16	25000	1.14	17	231911.6
17	26000	1.14	16	211568.48
18	27000	1.16	15	250169.06
19	28000	1.16	14	223650.5
20	29000	1.12	13	126541.3
21	30000	1.12	12	116879.28
22	31000	1.10	11	88446.618
23	32000	1.10	10	82999.759
24	33000	1.10	9	77812.274
25	34000	1.11	8	78354.284

26	35000	1.12	7	77373.849
27	36000	1.12	6	71057.617
28	37000	1.12	5	65206.642
29	38000	1.12	4	59793.736
30	39000	1.12	3	54792.192
31	40000	1.12	2	50176
32	41000	1.12	1	45920
				6756382.7

CHAPTER

6

Various Products Available to Save and Withdraw for Retirement

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- *Public Provident Fund*
- *Senior Citizen Saving Scheme*
- *EPF–1952*
- *Post Office–MIS*
- *GOI (8% taxable bonds)*
- *National Saving Certificates*
- *Kisan Vikas Patra*
- *Bank fixed deposits*
- *Various insurance policies*
- *Pension plans*
- *Products of mutual funds*
- *Reverse mortgage*

Which Investments will Make an Efficient Retirement Plan?

A retirement plan is an assurance that you will continue to earn a satisfying income and enjoy a comfortable life style even when you are no longer working.

We have to understand why an increasing number of individuals have already started planning for their retirement and why there is a need for everyone to plan for their retirement. Here, we will discuss various investment products available for retirement plans and various avenues where a regular stream of income can be generated after retirement. The different avenues are available for retirement planning as well as for the other goals at the various stages of life.

6.1 PUBLIC PROVIDENT FUND (PPF), 1968

This scheme was introduced by the central government in 1968. The scheme enables the members of the public to make contributions to the fund and obtain income tax rebate under the relevant provisions of the Income Tax Act.

Eligibility

- Individuals
- Individuals on behalf of a minor

Minimum/Maximum Investment (w.e.f. 15 November, 2002*)*

Minimum: Rs. 500 per annum in multiples of Rs. 5

Maximum: Rs. 70,000 per annum

Duration

- 15 years
- Can be extended for one or more blocks of 5 years
- Account can be discontinued but repayment of subscriptions along with interest will happen only after 15 years.

Rate of Interest

8 percent per annum credited in the account on 31, March every year calculated on the minimum balance between the 5th day and end of the month. The rate of interest changes as per the prevalent interest rates and is decided by the Ministry of Finance.

Loans

A loan can be taken against up to 25% of the balance at the end of the first financial year from the third to the sixth year. A second loan can be taken on full repayment of the first loan.

Withdrawals

Only one withdrawal is allowed during any one year after six years, i.e. in the seventh year. Withdrawal is limited to 50% of the balance in credit at the end of the 4^{th} year preceding the year in which the amount is withdrawn or the end of the preceding year whichever is lower.

For example, an account was opened by an individual in the year 1999–2000. The first withdrawal can be made after 31 March, 2005.

For the account extended beyond 15 years, partial withdrawal is allowed up to 60% of the balance to the credit at the commencement of the extended period. (Extended period means extension for a block of 5 years after completion of 15 years.)

Tax Benefits

- Benefit available u/s 80C of the I.T. Act .
- Interest totally exempt from income tax.
- Amount standing to the credit is fully exempted from wealth tax.

Other Facilities

- Subscription in one or more installments up to a maximum of 12 installments in a year.
- Nomination available in the name of one or more persons.
- Nominee cannot continue the account of the deceased subscriber in his/her own name.
- An account may be transferred at the request of the subscriber free of charge by one branch of State Bank of India or its associates to a head post office or vice versa.
- Premature closure of a PPF account on grounds of genuine hardship may be considered only after the expiry of five years from the end of the year in which the account was opened.
- The subscriber may discontinue his account any time after joining the fund. The repayment of the subscription with interest will be made only after 15 years from the end of the financial year in which the account was opened.
- The discontinued account can be revived on payment of Rs. 50 per year along with arrears of subscription of Rs. 500 per year.
- It is free from attachment by a court in respect of any debt or liability incurred by the subscriber.
- Is subject to attachment under the orders of the income tax authorities.

There are a set of questions related to PPF in order to understand it in detail. These are as follows.

1. Who can invest? How and where?

Anyone can open a PPF account. You can open an account in your own name or in the name of a minor, if you are the guardian. The account can be opened even if you subscribe to a General Provident Fund or the Employees' Provident Fund.

However, you can have only one PPF account in your name. If at any point it is detected that you have two accounts, the second account that you have opened will be closed and you will be refunded only the principal, not the interest. Again, two adults cannot open a joint account. It will have to be opened

in only one person's name; of course, the person who opens an account is free to appoint nominees.

A PPF account can be opened with a minimum deposit of Rs. 500 at any branch of the State Bank of India or branches of its associate banks like the State Bank of Mysore or Hyderabad. The account can also be opened at the branches of a few nationalized banks such as the Bank of India, Central Bank of India and Bank of Baroda, and at any head post office or general post office. After opening an account you get a pass book, which will be used as a record for all your deposits, interest accruals, withdrawals and loans.

2. For how long can you maintain your PPF account?

On paper, your PPF account must be maintained for a 15-year period. However, the tenure actually works out to 16 years, since you are allowed to make your last contribution in the 16th financial year. Even if you make a deposit on the last day of your account (that is, the day it is due to mature), you get a tax rebate, even though no interest accrues on the deposit.

3. Can you continue your account after the 15-year period?

Yes, but only in a block of five years at a time, with no upper limit.

4. Will you have to continue investing after extending your account?

No. If you merely retain your balance, it will earn 8 percent interest per annum till withdrawal.

5. What if you want to withdraw money during the extension period?

After the initial 15-year period, if you choose to extend the account and just maintain the balance, you can withdraw the entire sum in a lump sum or in installments. If you withdraw the money in installments, you cannot make more than one withdrawal a year.

If you continue to deposit money in your account you can withdraw up to 60 percent of the balance to your credit at the beginning of each extended period (block of five years). The money can be withdrawn in a lump sum. If you choose to withdraw it in installments, you cannot make more than one withdrawal a year.

6. Do you have to notify the bank about the extension?

Yes. The Central Board of Direct Taxes (CBDT) has stipulated that after 15 years, the tax benefits under section 80C will not accrue unless you choose to continue the account and deposit money in it.

7. How much money do you have to put into your PPF account?

Any amount not less than Rs. 500 and not exceeding Rs. 70,000 in a financial year, payable in a lump sum or in installments in multiples of Rs. 5. Not more than 12 installments can be deposited in a year. However, unlike in a bank recurring deposit, you do not need to deposit the same amount every month.

8. How much interest do you earn?

The interest rate is fixed periodically by the government. At present it is 8 percent compounded annually. The interest for a month is calculated on the lowest balance between the close of the fifth day and the end of the month and is credited to the account at the end of each year. So, to get the maximum returns, make deposits in the first few days of the month.

9. How do you withdraw money from your account?

The entire balance can be withdrawn on maturity that is, after 15 years of the close of the financial year in which you opened the account. Of course, you can choose to continue the account beyond 15 years but you will have to do so in blocks of five years.

Before maturity, you can make withdrawals within limits: from the seventh financial year, you can make one withdrawal every year of an amount not exceeding 50 percent of the balance at the end of the fourth year or the year immediately preceding the withdrawal, whichever is lower. If however, you have taken a loan, the amount you are eligible to withdraw will be reduced by the amount of the loan you have taken.

If you choose to continue the account after 15 years and make deposits, you can withdraw up to 60 percent of the balance to your credit at the beginning of each extended period (block of five years). The money can be withdrawn in a lump sum. If you choose to withdraw it in installments, you cannot make more than one withdrawal a year.

You can even retain the balance after 15 years without depositing any more money and without intimating the bank. The balance to your credit continues to earn interest till such time as you withdraw it. Of course, you can continue to make one withdrawal a year till you withdraw the entire amount.

10. Can you take a loan?

Yes, even before becoming eligible for a withdrawal in the seventh year, you can take a loan from the third year onwards. However, you cannot take a loan after you become eligible for the withdrawal facility. The loan amount should not exceed 25 percent of the amount to your credit at the end of the financial year immediately proceeding the year in which you apply for the loan.

The loan is repayable in a maximum of 36 installments at an interest rate of 1 percent per annum. If you are unable to repay the entire loan in 36 months, you will have to pay interest on the deficit. Of course, you will not be eligible for a fresh loan until you repay the first one with interest.

Tax benefits, nominations

Benefits Deposits (even those in the name of your spouse or minor children) are eligible for a tax rebate under section 80C of the Income Tax Act. What's more, interest accruals and withdrawals are exempt from income tax and the balance

in your account is exempt from wealth tax. Further, the balance in your PPF account cannot be attached by the courts in the event of any debt liability.

Nomination You can appoint one or more nominees to receive the money in your account in the event of your death. If you were to die before your account matures, your nominees get the money in your account after the initial lock-in period of 15 years. If you are in a transferable job, you can transfer your account to any scheduled bank or post office in the country.

Retirement planning A PPF account is the most effective tax-saving vehicle which could give you amazing returns for those sunset years, particularly when you consider that there is at no risk at all. When used as an instrument for retirement planning, a PPF account can provide a really big corpus at the time of retirement.

Pluses and minuses of a PPF account

A PPF account has more benefits than drawbacks.

Pluses

- Your money is absolutely safe.
- You have the flexibility of contributing varying amounts of between Rs. 500 and Rs. 70,000 a year, depending on your financial situation. The account can be kept active by depositing just Rs. 500 a year.
- You can even open an account on behalf of a minor if you are the guardian and claim the tax benefits for yourself.
- The income from PPF is fully exempt from income tax.

Minuses

- The tenure of the PPF scheme is 15 years, which makes it less attractive for older people.
- Although partial withdrawal is allowed from the seventh year, it is limited to 50 percent of the balance in your account at the end of the fourth year.

What should be done?

- Opening a PPF account pays. Open one even if you are not a taxpayer and keep it alive by depositing at least Rs. 500 a year. Step up your contributions towards maturity for a bigger savings corpus.
- Subject to the withdrawal stipulations, you can withdraw as and when you want and utilize the money for household expenses or other emergencies. The money can then be re-deposited (subject to a maximum deposit of Rs. 70,000 a year) using your taxable income for the year. This gives you a tax rebate without any additional cash outflow.
- A PPF account can be opened in the name of your minor child or spouse if you expect their income will soon be taxable. They can then make

withdrawals and re-deposit the money from their taxable income to claim a rebate without any additional cash outflow.

- You can contribute an aggregate of up to Rs. 70,000 a year to a PPF account in the name of your child (minor or major) to claim tax benefits for yourself. Subsequently, as long as the child is a minor, you can make withdrawals as per the PPF rules (from the seventh year onwards), and invest the money in pure growth schemes of mutual funds. Redeem them when the child attains majority. The capital gains arising out of the sale will not be taxable in your child's hands as long term capital gains are tax exempt.

6.2 SENIOR CITIZEN SAVING SCHEME (CAN BE BOUGHT AFTER RETIREMENT)

Government of India has decided to operate the scheme through all branches of public sector banks which operate the PPF Scheme, 1968.

Eligibility

- An individual who has attained the age of 60 years and above on the date of opening of an account.
- One who has attained the age of 55 years or more but less than 60 years and who has retired on superannuation or otherwise on the date of opening an account.
- A person who has retired at any time before the commencement of these rules and attained the age of 55 years or more on the date of opening of an account.
- The retired personnel of the defence services (excluding civilian defence employees) irrespective of the above age limits, subject to fulfillment of other specified conditions.

NRI

NRIs are not eligible to open an account under these rules.

HUF

Hindu Undivided Family is also not eligible to open an account under these rules.

Salient Features

- Any depositor may open an account at any deposit office by making an application in Form A along with the amount of deposit in multiples of one thousand rupees, along with proof of age.
- A depositor may operate more than one account subject to the condition that deposits in all accounts taken together shall not exceed the maximum limit of Rs. 15 lakh and provided that the deposits shall be

restricted to the retirement benefits of rupees fifteen lakh, whichever is lower.

- A depositor may open the account in an individual capacity or jointly with the spouse.

Deposits and Withdrawals

There shall be only one deposit in the account in multiples of one thousand rupees not exceeding rupees fifteen lakh.

No withdrawal shall be permitted under these rules before the expiry of a period of five years from the date of opening of an account.

Mode of Deposit

The deposit under these rules may be made

- In cash, if the amount of deposit is less than rupees one lakh.
- By cheque or demand draft drawn in favor of the depositor and endorsed in favor of the deposit office.

Renewal

The depositor may extend the account for a further period of three years after the maturity period of five years. An application in Form B should be made within a period of one year after the date of the maturity period.

Interest on Deposit

The deposit made under these rules shall bear interest at 9% per annum from the date of deposit payable at the end of each calendar quarter, e.g. 31st March/30th June/30th September/31st December.

Nomination

The depositor may nominate a person or persons at the time of opening of the account or at any time after the opening of the account but before its closure, by an application on Form C accompanied by the passbook to the concerned branch.

A nomination made by the depositor can be cancelled or varied.

Closure of Account

Maturity

The deposit made at the time of opening of account shall be paid by the concerned deposit office after the expiry of five years from the date of opening of the account on production of the pass book accompanied by a written application (withdrawal form) or Form E.

In case the depositor does not close the account on maturity and also does not extend the account, the account will be treated as matured and the depositor will be entitled to interest at the rate applicable to the deposits under post office savings account during the post maturity period.

Death of the Depositor

In case of death of the depositor before maturity the account shall be closed and the deposit refunded along with interest, on application in Form F, to the nominee or legal heirs in case the nominee has also expired or nomination was not made as per rules.

If the total amount including interest payable is up to rupees one lakh, it may be paid to the legal heirs on production of (i) letter of indemnity (ii) an affidavit (iii) a letter of disclaimer on affidavit, and (iv) a certificate of death of the depositor on stamped paper in the form, as an annexure to Form F.

Premature Closure of Account

On an application in Form E the depositor may be permitted to withdraw the deposit and close the account at any time after the expiry of one year from the date of opening of the account subject to the following conditions:

- In case the account is closed after the expiry of one year but before the expiry of two years from the date of opening of the account, an amount equal to one and half percent of the deposit shall be deducted and the balance paid to the depositor
- In case the account is closed on or after the expiry of two years from the date of opening of the account, an amount equal to one percent of the deposit shall be deducted and balance paid to the depositor.

Transfer of Account

A depositor may apply on Form G for transfer of his account from one deposit office to another in case of change of residence.

6.3 EMPLOYEE PROVIDENT FUND SCHEME, 1952

In any organization where 20 or more employees work at any time, is covered under the Employees Provident Fund Act, 1952.

When any person joins an organization which is covered under the Employees Provident Fund Scheme, 1952, a stipulated sum (12% or10% of basic) is deducted from the salary of the employee as contribution towards the fund. The employer makes a matching contribution. The amount thus contributed is invested in government securities. The fund is managed by a Board of Trustees under the PF Act.

Employee Definition

"Employee" as defined in section 2(f) of the Act means any person who is an employee for wages in any kind of work manual or otherwise, in or in connection with the work of an establishment and who gets wages directly or indirectly from the employer and includes any person employed by or through a contractor in or in connection with the work of the establishment.

Membership

All the employees (including casual, part time, daily wage, contract, etc.) other than an excluded employee, are required to be enrolled as members of the fund from the day that the Act comes into force in such an establishment

Basic Wages

Basic wages means all emoluments which are earned by an employee while on duty or on leave or holiday, with wages in either case in accordance with the terms of the contract of employment and which are paid or payable in cash, but does not include:

- The cash value of any food concession
- Any dearness allowance (that is to say, all cash payment by whatever name it is called, paid to an employee on account of a rise in the cost of living), house rent allowance, overtime allowance, bonus, commission or any other allowance payable to the employee in respect of employment or of work done in such employment.
- Any present made by the employer

Employees' Provident Fund Scheme takes care of the following needs of the members:

(i) Retirement
(ii) Medical care
(iii) Housing
(iv) Family obligation
(v) Education of children
(vi) Financing of insurance polices

How the Employees' Provident Fund Scheme Works

As per amendment dated 22 September, 1997 in the Act, both the employees and employer contribute to the fund at the rate of 12% of the basic wages, dearness allowance and retaining allowance, if any, payable to employees per month. The rate of contribution is 10% in the case of the following establishments:

- Any covered establishment with less then 20 employees, for establishments cover prior to 22 September, 1997.
- Any sick industrial company as defined in clause (O) of sub-section (1) of section 3 of the Sick Industrial Companies (Special Provisions) Act, 1985 and which has been declared as such by the Board for Industrial and Financial Reconstruction
- Any establishment which has at the end of any financial year accumulated losses equal to or exceeding its entire net worth, and

- Any establishment engaged in manufacturing of (a) jute (b) breed (c) coir and (d) guar gum industries/factories. The contribution under the Employees' Provident Fund Scheme by the employee and employer will be as under with effect from 22 September, 1997.

Employees' Provident Fund Interest Rate

The rate of interest is fixed by the central government in consultation with the Central Board of Trustees, Employees' Provident Fund every year during March/April. The interest is credited to the members account on a monthly running balance with effect from the last day in each year. The current rate of interest on Employees Provident Fund Scheme is 8.5% per annum.

Benefits

(A) A member of the provident fund can withdraw the full amount at the credit in the fund on retirement from service after attaining the age of 55 years. The full amount in the provident fund can also be withdrawn by the member under the following circumstances:

- A member who has not attained the age of 55 years at the time of termination of service
- A member is retired on account of permanent and total disablement due to bodily or mental infirmity
- On migration from India for permanent settlement abroad or for taking employment abroad
- In the case of mass or individual retrenchment

(B) In the case of the following contingencies, the payment of provident fund is made after completing a continuous period of not less than two months immediately preceding the date on which the application for withdrawal is made by the member:

- Where employees of close establishment are transferred to other establishment, which is not covered under the Act
- Where a member is discharged and is given retrenchment compensation under the Industrial Dispute Act, 1947

Withdrawal before Retirement

A member can withdraw up to 90% of the amount of the provident fund at credit after attaining the age of 54 years or within one year before actual retirement on superannuation, whichever is later. A claim application in Form 19 may be submitted to the concerned provident fund office.

Transfer of Provident Fund Account

Transfer of provident fund account from one region to another, from an exempted Provident Fund Trust to a non-exempt Fund in a region and vice-

versa, can be done as per scheme. A transfer application in Form 13 may be submitted to the concerned provident fund office.

Nomination

The member of the provident fund shall make a declaration in Form 2, a nomination conferring the right to receive the amount that may stand to the credit in the fund in the event of death. The member may furnish the particulars concerning himself and his family. These particulars will help the organization in building up the data bank for use in the event of the death of the member.

Annual Statement of Account

As soon as possible and after the close of each period of currency of contribution, annual statements of accounts are sent to each member. The statement of accounts in the fund will show the opening balance at the beginning of the period, the amount of contribution during the year, the total amount of interest credited at the end of the period or any withdrawal during the period and the closing balance at the end of the period. Members should satisfy themselves as to the correctness of the statement and any error should be brought to the notice of the correct provident fund office, through employer, within 6 months of the receipt of the statement.

We have covered the Employees Provident Fund scheme in detail. Let us take a simple example to understand how a small contribution by the employer and employee accumulates a respectable amount which can be used to fund retirement needs. We also assume here that the person has chosen a PF option in place of a pension option.

Mr. Sudhakar works in an organization covered under EPF Act, 1952. His basic salary is Rs. 10,000. 12% of the basic salary is contributed by the employer and 12% by the employee. Mr. Sudhakar is 25 years old. What amount will be accumulated by him at the time of retirement at age 60? The average rate of return on PF is 9% p.a.

12% of 10000 = 1200 + 1200 = 2400. Rs. 2,400 will be contributed by the employer also.

2400 = Pmt

35 × 12 = N

9/12 = I

Compute FV = Rs. 70,60,282

Simply by putting aside Rs. 2,400 each month the total amount has become Rs. 70.60 lakh in 35 years. In this case, we have not assumed the increase in salary which occurs every year. If this is taken at 10% every year then this will be easily calculated with the help of an Excel sheet as explained in the following box.

BOX

Year	*Amount deposited every year*	*Rate factor*	*No. of years*	*FV*
1	28800	1.09	35	587922.3
2	31680	1.09	34	593316.1
3	34848	1.09	33	598759.3
4	38332.80	1.09	32	604252.5
5	42166.08	1.09	31	609796.1
6	46382.69	1.09	30	615390.6
7	51020.96	1.09	29	621036.4
8	56123.05	1.09	28	626734
9	61735.36	1.09	27	632483.8
10	67908.89	1.09	26	638286.4
11	74699.78	1.09	25	644142.3
12	82169.76	1.09	24	650051.8
13	90386.74	1.09	23	656015.6
14	99425.41	1.09	22	662034.1
15	109367.95	1.09	21	668107.8
16	120304.75	1.09	20	674237.2
17	132335.22	1.09	19	680422.9
18	145568.74	1.09	18	686665.3
19	160125.62	1.09	17	692965
20	176138.18	1.09	16	699322.5
21	193752.00	1.09	15	705738.3
22	213127.20	1.09	14	712212.9
23	234439.92	1.09	13	718747
24	257883.91	1.09	12	725341
25	283672.30	1.09	11	731995.5
26	312039.53	1.09	10	738711.1
27	343243.48	1.09	9	745488.2
28	377567.83	1.09	8	752327.6
29	415324.62	1.09	7	759229.6
30	456857.08	1.09	6	766195.1
31	502542.79	1.09	5	773224.4
32	552797.06	1.09	4	780318.2

33	608076.77	1.09	3	787477.1
34	668884.45	1.09	2	794701.6
35	735772.89	1.09	1	801992.5
				24135642

FV = PV × 1.09^35 for 1st year and so on. We have to do a calculation only for two columns and then drag it.

6.4 POST OFFICE MONTHLY INCOME SCHEME

- Monthly Income Scheme is an ideal scheme for VRS takers and retired persons seeking a fixed monthly income.
- Interest is at the rate of 8 percent per annum.
- Additionally, there is a bonus of 5 percent of the deposit amount on maturity after six years.
- No tax deduction at source.
- Deposit range starts from Rs. 1,000 and goes up to Rs. 3,00,000 in case of a single account and up to Rs. 6,00,000 in case of a joint account.
- No TDS is applicable for the interest.

Procedure

Opening of Account

Monthly income scheme account can be opened at any post office by filling the MIS form and depositing a minimum of Rs. 1,000 or multiples thereof. The monthly income scheme account is transferable from one post office to another and nomination facility is also available for the account. A depositor can open multiple monthly income scheme accounts, However, the total amount invested in all his/her single accounts, together with his/her portions in joint accounts should not exceed Rs. 300,000. A single monthly income scheme account can be converted into a joint account and vice versa.

The monthly income scheme account may be opened in

- Single name (Rs. 3,00,000 maximum)
- Joint Name (Rs. 6,00,000 maximum)

The Monthly income scheme account cannot be opened by non-resident Indians as there is no provision for opening of such accounts in the monthly income scheme rules. Karta of a Hindu Undivided Family also cannot open the monthly income scheme account.

Deposit Deposit in the monthly income scheme account is accepted in cash, by cheque or by demand draft. The cheque or draft can be drawn in favor of the depositor or the postmaster of the post office and endorsed in favor of the postmaster. Where the deposit is made by cheque or demand draft, the date of

deposit under these rules shall be the date of encashment of the cheque or the demand draft

Nomination Nomination facility, for nominating the beneficiary in the event of death of the depositor, is available at the time of depositing the money. If such a nomination is not made at the time of opening the account, the depositor can do so at any time later by means of an application, accompanied by the passbook to the postmaster of the post office.

Interest Payment The interest on deposit is paid on a monthly basis on a fixed date, when the deposit is made. If the due date of interest payable falls on a Sunday or any holiday, the interest is paid on the date immediately preceding. If the due date of interest falls on 29th, 30th or 31st and the date does not come in the month, then the deposit is paid on the last working day of the month. The amount of monthly interest can also be deposited in the post office saving bank account of the depositor, if the depositor authorizes the post office accordingly. This is subject to the condition that the maximum limit of the saving bank account is not exceeded by depositing such interest. The depositor has to produce the pass book every month for collection of interest. A depositor availing the facility of credit of interest in his savings account may be required to present the pass book at least once in six months for making entries of payment of interest.

In short, a depositor can opt for payment of interest by:

- Automatic credit in a post office savings account
- Filling up an application for withdrawal.
- Post-dated cheques
- Electronic clearance system in some selected post offices in Mumbai

Payment of Bonus At the maturity of the deposit that is, after the period of six years, the depositor gets the initial invested amount along with bonus equal to ten percent of the initial investment amount. The depositors need to produce a written application along with the pass book of the account to the post office for this. The bonus of 10% has been reduced to 5%.

Premature Closure of Account An account can be closed at any time after expiry of one year from the date of opening of the account. The amount equal to 5 percent of the initial investment amount will be deducted from the payment if the account is closed before three years from the date of opening. No amount will be deducted for the withdrawal after three years. However, no bonus is applicable to any premature closure of the account.

In case of death of a depositor before maturity, the account is closed and the deposited amount is refunded to the nominee or the legal heir of the depositor along with interest up to the month preceding the month of refund of money. The nominee or legal heir is not allowed to continue the account by transferring it to his name after the death of the depositor. The deduction of 5 percent of the

deposit will not be made in such cases, if the account is closed before the expiry of three years from the date of opening the account.

Features of the Scheme

The scheme is issued vide Government of India, MOF (DEA) Notification No. GSR 701 (E) dated August 10, 1987 and further amended from time to time. The account can be opened in and is transferable to any post office in India. The scheme is most useful for those who have taken VRS (retired persons under Voluntary Retirement Scheme) or a retired person.

An employed person gets a regular income every month. However after retirement, the monthly income stops or reduces either voluntarily or compulsorily, but expenditure does not.

A monthly income scheme can help by providing a regular income, taking care of your monthly expenditure while safeguarding your initial investment for emergencies. The flexibility of change of place is available to the scheme. This is mainly useful for retired persons who may want to shift to another place after retirement.

The post office monthly income scheme (MIS) provides for monthly payment of interest income to investors. It is meant for investors who want to invest a lump sum amount initially and earn interest on a monthly basis for their livelihood. The scheme is therefore, a boon for retired persons.

The post office MIS gives a return of 8.9 percent with a bonus of 5 percent on maturity. However, this 5 percent bonus is not available in case of premature withdrawals and this 5 percent bonus is also not available on new investments. This has been withdrawn. Return in PO (MIS) is now 8 percent only.

Here is a set of questions related to the post office (MIS) scheme.

INVESTMENT OBJECTIVES

1. Is MIS suitable for an increase in investment?

No, the MIS is not suitable for an increase in investment. It is meant to provide a source of regular income on a long-term basis.

2. Is MIS suitable for regular income?

Yes, the monthly income scheme, as its name suggests, is best suited to provide regular income. Interest is payable on a monthly basis at the pre-specified date.

3. To what extent does the MIS protect me against inflation?

With a fixed rate of return, the MIS does not provide adequate safeguards against high inflation rates.

4. Can I borrow against MIS?

Yes. It depends if the banker accepts this as a security.

RISK CONSIDERATIONS

5. How assured am I of getting my full investment back?

Like all post office schemes, the MIS has the backing of the Government of India and is therefore a safe investment. You can be assured of getting your full investment back.

6. How assured is my income?

Your monthly interest income is assured at the specified rate of interest. Since this scheme has the backing of the Government of India it is a safe investment channel.

7. Are there any risks unique to MIS?

No, there is no credit risk associated with your investment in MIS. This is a risk-free investment that is backed by the Government of India. But all the risks associated with investment in debt instruments are also associated with this scheme.

This is a monthly income plan that is utilized by those in need of a regular source of income and is most suited to retired individuals.

Risks Involved in Debt Instruments

There is no investment which does not have any risk. When we talk of investment in government securities, we say risk less investments. In government securities there is no default risk but other risks which are part of debt investment will affect even government securities. The following are the risks involved in all debt instruments.

- Interest rate risk
- Reinvestment risk
- Inflation risk
- Liquidity risk
- Default risk
- Call risk

Interest rate risk Interest rates tend to vary over a period of time thus causing fluctuations in the prices of the existing bonds. A rise in interest rate will bring about fall in the prices of existing bonds. In other words if a person buys a bond, say for a fixed period at a fixed coupon rate of interest, he will get the same rate till maturity even if the market interest rates have gone up. If he needs to sell these bonds he will get a lesser price than the face value. Interest rate risk is measured by the percentage change in the prices of the bonds in response to change in interest rates.

Reinvestment risk Reinvestment risk will arise when interest rates fall and the bond holder will not be able to reinvest the coupon amount at the same rate of interest. Instead, he will have to invest at a lower rate of interest. This risk will be more for bonds with longer maturity than for bonds with shorter maturity.

Inflation risk Inflation risk is the risk that at a given fixed rate of interest, if inflation increases, the real rate of return will come down. For example, the fixed rate of return was 8% for a period of 5 years for a security and the inflation rate at that time was 5%. If inflation increases to 6% say after 2 years, the bond holder will get interest of 8% only for the remaining term. In real terms, his real return will come down. Inflation risk will be more for longer period bonds.

Liquidity risk Liquidity means easy encashment of instruments when required. In case of debt instruments, the secondary market for debt instruments is not as active as the equity market. Investors face difficulty in selling their debt instruments, thus the liquidity risk. Sometimes they have to sell their instruments at a discount.

Default risk Default risk refers to the risk that accrues because of inability of the company to pay the coupon amount and the maturity amount, at maturity. Default risk of a security can be known from the ratings of the securities. A security with AAA rating has less risk of default than a security with AA rating. A security with a low rating has to offer a high rate of yield than a security with high rating. Investment in government securities has no default risk.

Call risk A bond issue may come with the call feature attached to it. When interest rates are likely to come down in future, the issuers of bonds generally attach a feature that bond may be called back before maturity. In this case, they also specify the period after which the bond may be called back. If an investor invests in this bond, he may be asked to get early payment of the bond and he will have to reinvest the amount received at a lower rate of interest.

7. Is the MIS rated for credit quality?

No, the MIS does not require any commercial ratings as it has the backing of the Government of India. It is considered to be free of risk.

BUYING, SELLING, AND HOLDING

8. How do I buy a Post Office Monthly Income Scheme?

You can buy a post office MIS at any post office in India.

9. What is the minimum investment and range of investment in MIS?

The minimum investment in a post office MIS is Rs. 6,000 for both single and joint accounts. The maximum investment for a single account is Rs. 3 lakh and Rs. 6 lakh for a joint account.

10. What is the duration of MIS?

The duration of the MIS is six years.

11. Can MIS be sold in the secondary market?

No, you cannot trade your MIS in the secondary market.

12. What is the liquidity of MIS?

Investors can withdraw money before three years but at a discount of 5 percent. No such deduction will be made if an account is closed after three years. Premature closure of the account is permitted any time after the expiry of a period of one year after opening the account. Deduction of an amount equal to 5 percent of the deposit is to be made when the account is prematurely closed.

13. How is the market value of MIS determined?

As mentioned earlier, post office MIS cannot be traded in the secondary market. Therefore, the question of market value of MIS does not arise.

14. What is the mode of holding of MIS?

Post office MIS is held physically in the form of a certificate issued by the post office. In addition, the investor is provided with a pass book to record his transactions against his MIS.

TAX IMPLICATIONS

The interest income accruing from a post office MIS used to be exempt under section 80L of the Income Tax Act, 1961 subject to an overall ceiling of Rs. 15,000. Section 80L has been withdrawn. No TDS is deductible on the interest income. The balance is exempt from wealth tax.

6.5 GOVERNMENT OF INDIA 8 PERCENT SAVINGS (TAXABLE) BONDS, 2003

Eligibility for Investment

The bonds may be held by

- an individual, not being a non-resident Indian
  - in his or her individual capacity
  - in individual capacity on joint basis
  - in individual capacity on anyone or survivor basis
  - on behalf of a minor as father/mother/legal guardian
- Hindu Undivided Family.
- Charitable Institution, which means
  - a company registered under section 25 of the Indian Companies Act, 1956
  - an institution which has obtained a Certificate of Registration as a charitable institution in accordance with a law in force
  - any institution which has obtained a certificate from an income tax authority for the purposes of section 80G of the Income Tax Act, 1961.
- "University" means a university established or incorporated by a Central, State or Provincial Act and includes an institution declared

under section 3 of the University Grants Commission Act, 1956 (3 of 1956) to be a university for the purposes of that Act.

Limit of Investment

There will be no maximum limit for investment in the bonds.

Tax Treatment

- **Income tax** Interest on the bonds will be taxable under the Income Tax Act, 1961 as applicable according to the relevant tax status of the bond holder.
- **Wealth tax** The bonds will be exempt from wealth tax under the Wealth Tax Act, 1957.

Issue Price

- The bonds will be issued at par, i.e. at Rs. 100.
- The bonds will be issued for a minimum amount of Rs. 1,000 (face value) and in multiples thereof. Accordingly, the issue price will be Rs. 1,000 for every Rs. 1, 000.

Subscription

Subscription to the bonds will be in the form of cash/drafts/cheques. Cheques or drafts should be drawn in favor of the bank (receiving office)

Date of Issue

The date of issue of the bonds in the form of a bonds ledger account will be opened (issued) from the date of tender of cash or the date of realization of draft/ cheque.

Form

The bonds will be issued only in the form of bonds ledger account and may be held at the credit of the holder in an account called the bonds ledger account (BLA). The bonds will be issued and held with a number of branches of banks and SHCIL as authorized by the Reserve Bank of India.

Receiving Offices

Applications for the bonds in the form of bonds ledger account will be received at:

- Any number of branches of State Bank of India, associate banks, nationalized banks, four private sector banks and SCHIL as specified
- Any other bank or number of branches of the banks and SCHIL where the applications will be received as specified by the Reserve Bank of India in this behalf from time to time

Nomination

- A sole holder of bonds, being an individual, may nominate in Form B, one or more persons who shall be entitled to the bonds and the payment thereon in the event of the holder's death.
- Where any amount is payable to two or more nominees and either/or any of them dies before such payment becomes due, the title to the bonds shall vest in the surviving nominee or nominees and the amount being due thereon shall be paid accordingly. In the event of the nominee or nominees predeceasing the holder, the holder may make a fresh nomination.
- No nomination shall be made in respect of the bonds issued in the name of a minor.
- A nomination made by a holder of a Bond may be varied by a fresh nomination in Form B or as near thereto as may be, or may be cancelled by giving notice in writing to the receiving office in Form C
- Every nomination and every cancellation or variation shall be registered at the receiving office where the bond is issued and shall be effective from the date of such registration.
- If the nominee is a minor, the holder of the bonds may appoint any person to receive the bonds/amount due in the event of death during the minority of the nominee.

Transferability

The bonds in the form of bonds ledger account shall not be transferable.

Interest

The bonds will bear interest at the rate of 8% per annum. Interest on non-cumulative bonds will be payable at half-yearly intervals from the date of issue and bonds will be compounded with half-yearly rests and will be payable on maturity along with the principal, as the subscriber may choose. In the latter case, the maturity value of the bonds shall be Rs. 1,601 (being principal and interest) for every Rs. 1,000). Interest on bonds in the form of bonds ledger account will be paid by cheque/warrant or through ECS by credit to the bank account of the holder as per the option exercised by the investor/holder.

Advances/Tradability against Bonds

The bonds shall not be tradable in the secondary market and shall not be eligible as collateral for loans from banks, financial Institutions and Non-Banking Financial Company (NBFC), etc.

Repayment

The bonds shall be repayable on the expiration of 6 (six) years from the date of issue.

6.6 NATIONAL SAVING CERTIFICATES

National Savings Certificate, popularly known as NSC, is a time-tested tax saving instrument that combines adequate returns with high safety.

National Savings Certificate can be purchased by the following:

- An adult in his own name or on behalf of a minor
- A minor
- A trust
- Two adults jointly
- Hindu Undivided Family

National Savings Certificates are available in denominations of Rs. 100, Rs. 500, Rs. 1,000, Rs. 5,000 and Rs. 10,000. There is no maximum limit on the purchase of the certificates.

Period of maturity of a certificate is six years. Presently, maturity value of a certificate of Rs. 100 denomination is Rs. 160.10. The maturity value of a certificate of any other denomination is at a proportionate rate. Premature encashment of the certificate is not permissible except at a discount in the case of death of the holder(s), forfeiture by a pledge and when ordered by a court of law.

Interest accrued on the certificates every year is liable to income tax but deemed to have been reinvested. Income tax rebate is available on the amount invested and interest accruing under section 80C of the Income Tax Act as amended from time to time. Income tax relief was also available on the interest earned as per limits fixed vide section 80L of the Income Tax Act. Rebate under section 80L has been withdrawn.

6.7 KISAN VIKAS PATRA

If a person wishes to double his investments in less than nine years, KVP is for him. But there is a catch. The scheme, which offers to double your money in eight years and seven months, offers no tax benefits.

One can exit the scheme any time after 2.5 years from the investment date, though investors will have to bear the loss of interest for the invested time period.

Though KVP is not meant for regular income, it is a safe avenue of investment for those without pressing tax concerns. Liquidity is also reasonably higher here.

There is a set of questions related to Kisan Vikas Patra.

1. How do I invest in Kisan Vikas Patra?

You can buy KVP by filling up the appropriate application form available at post offices across the country.

2. What is the minimum investment and range of investment in KVP?

The minimum investment in KVP is Rs. 100. Certificates are available in denominations of Rs. 100, Rs. 500, Rs. 1,000, Rs. 5,000, Rs. 10,000 and Rs. 50,000. The denomination of Rs. 50,000 is sold through head post offices only. There is no limit on holding of these certificates. Any number of certificates can be purchased. A KVP is sold at face value; the maturity value is printed on the certificate.

6.8 BANK FIXED DEPOSITS

A fixed deposit is meant for those investors who want to deposit a lump sum of money for a fixed period; say for a minimum period of 15 days to five years and above, thereby earning a higher rate of interest in return. The investor gets a lump sum (principal + interest) at the maturity of the deposit.

Bank fixed deposits are one of the most common savings scheme open to an average investor. Fixed deposits also give a higher rate of interest than a savings bank account. The facilities vary from bank to bank. Some of the facilities offered by banks are overdraft (loan) facility on the amount deposited, premature withdrawal before the maturity period (which involves a loss of interest), etc.

Features

Bank deposits are fairly safe because banks are subject to control of the Reserve Bank of India (RBI) with regard to several policy and operational parameters. The banks are free to offer varying interests in fixed deposits of different maturities. Interest is compounded once a quarter, leading to a higher effective rate. The nominal rate offered by banks becomes effectively higher if compounding is done more than once a year.

The minimum deposit amount varies with each bank. It can range from as low as Rs. 100 to an unlimited amount with some banks. Deposits can be made in multiples of Rs. 100.

Before opening a FD account, one should check the rates of interest for different banks for different periods. It is advisable to keep the amount in five or ten small deposits instead of making one big deposit. In case of any premature withdrawal of partial amount, only one or two deposits need to be prematurely encashed. The loss in interest will thus be less than if one big deposit were to be encashed. One should check deposit receipts carefully to see that all particulars have been properly and accurately filled in. The thing to consider before investing in an FD is the rate of interest and the inflation rate. A high inflation rate can simply take away real returns.

Returns

The rate of interest for bank fixed deposits varies depending on the maturity period (duration) of the FD and the amount invested. Interest rate also varies

between each bank. A bank FD does not provide regular interest income, but a lump sum amount on its maturity.

Some banks have the facility to pay interest every quarter or every month but the interest paid may be at a discounted rate in case of monthly interest. The interest payable on fixed deposit can also be transferred to the savings bank or current account of the customer. The deposit period can vary from 15, 30 or 45 days to 3, 6 months, 1 year and 1.5 years to 5 years and so on.

Advantages

Bank deposits are the safest investment after post office savings because all bank deposits are insured under the Deposit Insurance and Credit Guarantee Scheme of India. It is possible to get a loan of up to 75–90% of the deposit amount from banks against fixed deposit receipts. The interest charged will be 2% more than the rate of interest earned by the deposit.

Interest on bank deposits is now taxable. It used to be exempt under section 80L up to an amount of Rs. 12,000 and Rs. 15,000 if it included interest on government securities also. The 1995 Finance Bill proposals introduced tax deduction at source (TDS) on fixed deposits on interest incomes of Rs. 5,000 and above per annum.

How to apply?

One can get a bank FD at any bank, be it nationalized, private or foreign. You have to open an FD account with the bank and make the deposit. However, some banks insist that you maintain a savings account with them in order to operate a FD.

When a depositor opens an FD account with a bank, a deposit receipt or an account statement is issued to him, which can be updated from time to time depending on the duration of the FD and the frequency of the interest calculation. Check deposit receipts carefully to see that all particulars have been properly and accurately filled in.

Bank FDs under Section 80C

The Finance Act, 2006 inserted a new clause (xxi) to section 80C (2) of the IT Act with effect from the assessment year 2007–08.

Term deposits for a fixed period of not less than 5 years with a scheduled bank will now be eligible for deduction in the computation of income, subject to the overall ceiling of Rs. 1,00,000 under section 80C.

The idea in bringing bank deposits within the ambit of section 80C is to provide a level playing field among banks and other institutions such as insurance companies and mutual funds.

The 2005 Budget removed the exemption of Rs. 12,000 for interest from bank deposits under section 80L.

Instead of a separate exemption for bank interest, hereafter, the contribution to bank FDs will be eligible for straightforward deduction from gross total income.

It should be noted that interest income from bank deposits will be taxed at the appropriate rate.

The exemption is available for deposits made in banks on or after 1 April, 2006. Is it open to depositors to foreclose the deposits made in the earlier years and opt for fresh deposits to avail themselves of the exemption?

A welcome change

The new exemption conferred on investments in bank FDs is welcome. If the rate of interest on bank FDs is 6 percent per annum and the taxpayer is in the 30 percent tax bracket, the tax adjusted effective return will be 8.56 percent. It will be 7.5 percent if the marginal rate of tax is 20 percent.

According to recent surveys, the middle-class has a penchant for investing in bank FDs. The latest tax incentives will make them even more attractive. The amendment applies only to deposits in scheduled banks. Deposits in co-operative banks have been excluded from this benefit.

The various financial instruments available for tax saving have different periods of maturity and lock-in periods ranging from three year for ELSS to15 years for PPF.

6.9 VARIOUS INSURANCE SCHEMES

Term Insurance Plan

Term Insurance plan is not a tool for retirement planning. It is a pure protection policy which does not involve any investment element. Requirement of life insurance arises when a person has financial dependents. The cover should be bought for an amount that is sufficient to ensure that if anything happens to the earning member, the family should not suffer financially. Those who have enough assets that can take care of the family after the demise of the earning member do not need life insurance cover. It must also be seen that assets are not just sufficient to pay off liabilities. For this, a separate coverage is required or in other words the amount of liability should be added to the life insurance requirement.

Ideally, one should purchase a life cover when one is healthy because the premium is dependent on age as well as the state of health. Normally, insurance companies do not insist on any health certification up to the age of 35.

Therefore, it is advisable to opt for life insurance cover prior to attaining the age of 35. You need to be more particular if your family health history puts you in the 'risky' category. If it does, you may have to pay a higher premium. If you have financial dependents, you should purchase life insurance immediately. If

not, you can choose the time of buying a policy after considering all these factors.

Once you buy a life insurance policy and get a life cover, you should review your situation periodically to ensure that you are adequately covered. For example, you should enhance the cover once you get married and enhance it even further when you have children. The reverse process begins once you grow older and your children are settled. The premium which is paid should be treated as an annual expense.

How much insurance cover should one buy?

You have to begin with your pay cheque and deduct your savings and personal (self maintenance) expenses from it. The remaining amount is what is actually available for your family. This amount has to be replaced for the number of years that the family requires money.

There are three ways to compute the required amount of insurance:

(a) Human life value method

(b) Need based method

(c) Multiple approach method

Human life value It is the capitalized value of that part of income which is available for the family for the number of years of the remaining period of service. We will use the risk-free rate as the discount rate. The increase in salary is also not taken into consideration as we assume that increase in salary will be equal to rate of inflation.

For example Mr. Grover who is 30 years old earns a salary of Rs. 5,00,000 (net of taxes) every year. Out of that he spends Rs. 40,000 on self maintenance. He pays a premium of Rs. 15,000 per annum for medical insurance for himself, his wife and children. He also pays taxes, etc. worth Rs. 25,000 p.a. He will retire at age 60. The amount of insurance required will be calculated thus:

Gross income	= Rs. 5,00,000
Deduct	
Self maintenance expenses	= Rs. 40,000
Premium amount	= Rs. 15,000
Taxes etc	= Rs. 25,000
	Rs. 80,000

Amount available for the family = Rs. 4,20,000

This amount will be available for the family for the next 30 years if earning member survives till his retirement. But if something happens to him, his family needs this much income every year, at the beginning of every year for the next 30 years.

420000	= Pmt
	Bgn
30	= *n*
8	= *i*

Compute present value = Rs. 51,06,530.

He needs an insurance cover of Rs. 51 lakh. If he has already saved some money for the family then he needs a lower amount of insurance to that extent. If he has investments worth Rs. 10 lakh he needs cover of Rs. 41 lakh. His existing term insurance cover will be deducted from this and the remaining amount will be the insurance required. In this case, if the already existing cover is Rs. 10,00,000 then the required amount of insurance is Rs. 31 lakh.

Need based method In the case of this method we will consider the various needs of a client during his life time. In other words we will set goals and calculate the present value of all the goals. We will add up the present value of all the goals and from this we will deduct the amount of investments already available with the family and the amount of existing insurance cover. The different needs will be:

(a) Emergency fund
(b) Education fund
(c) Childrens' marriage fund
(d) Retirement fund
(e) Mortgage redemption fund (for the amount of loan)

Need based method will provide for all the future needs of the family.

Multiple approach This approach calculates the replacement of required income, by taking into consideration the rate of return expected on investments.

For example, a family requires an annual income of Rs. 2,40,000 and the rate of return is 10% p.a. The amount required which can replace the existing requirement for the family is 240000/.10 = Rs. 24, 00,000. Again, if there are some existing investments, that amount will be reduced from the required amount.

Endowment Plans

Endowment plans are very popular as they serve two purposes namely, life cover and savings. Under a plain vanilla endowment plan, the policyholder pays regular premiums for the policy term. If the policy holder dies during the policy term, the nominee gets the death benefit i.e. the sum assured and accumulated bonuses. On survival, the policyholder gets a survival benefit including vested bonus and terminal bonus, if any.

In other words you get a return on your investments in endowment plans either during the tenure of the insurance contract or on its maturity. These plans are attractive to some investors as a saving element is also involved. In term

plans the family gets the sum assured only on the death of the person during the term period. In an endowment plan, if a person survives the policy term he gets an element of investment. Out of the total premium some amount goes towards risk cover and a portion is invested in permissible instruments. A small portion also goes towards meeting the administrative costs of the insurers. This component reduces the effective yield on investments.

Whole life insurance

This is insurance for the whole life as opposed to term life insurance, which is insurance for a specific term such as twenty or thirty years. The primary benefit of whole life insurance is that a payout is guaranteed. These plans are not popular for the simple reason that one pays premium and no payout comes as long as one is alive. The money comes back either at death or at age 80, whichever is earlier.

Whole life insurance is often useful in estate building. It is one vehicle used by financial planners to protect assets for the next generation. In these policies the estate is transferred to the next generation without stamp duties and other formalities. Whole life policies are also suitable for those who start families at a later stage of their lives and there are chances of the children being young when a person turns 65. A term insurance plan will terminate at that time. Only a whole life plan will help their families. These policies should be recommended by financial planners only after considering the needs of investors.

This benefit of a guaranteed whole life insurance settlement comes with a price. Your premium may be several times higher than the premium for a level term life insurance policy of the same face amount. This is because a portion of your premium goes to fund a tax-deferred cash value account. And of course, you are buying the life insurance for a longer time period—your whole life.

If you decide to cancel your whole life policy you are entitled to receive the cash value. Additionally, you may borrow against the cash value at a reasonable interest rate. When you die, funds will be deducted from the insurance proceeds to pay the amount of any loans and interest if you have not already paid them. It is a long-term product which generates cash value only after 12–14 years. Following are a few questions on whole life policies.

1. What is whole life insurance?

Whole life insurance covers you for your entire life, not just for a specific period such as term insurance. Your death benefit and premium in most cases will remain the same. Whole life insurance also builds cash value, which is a return on a portion of your premiums that the insurance company invests. Your cash value is tax-deferred until you withdraw it and you can borrow against it.

2. Are there choices within whole life insurance?

Yes, the most common choices include traditional, interest-sensitive, and single premium whole life. Traditionally, it gives you a guaranteed minimum rate of

return on your cash value portion. Interest-sensitive gives a variable rate on your cash value portion. With interest-sensitive whole life you can have more flexibility with your policy such as increasing your death benefit without raising your premiums, depending on the economy and the rate of return on your cash value portion. Single premium is for someone who has a large sum of money and would like to purchase a policy up front. Like other whole life options, single premium whole life accrues cash value and has the same tax shelter on returns.

3. What are the benefits of choosing whole life over other types of life insurance?

Unlike term life insurance, a portion of your premium money goes towards your cash value which in turn could pay off your entire policy only after a few years. Also, your premium will remain constant during the time you are covered unless you choose otherwise. And, unless you make a change to your policy, you have lifelong coverage with no future medical examinations. Whole life is also a good choice because of the tax savings.

4. Should I purchase a whole life policy for an investment?

The rate of return on a whole life insurance policy is very low compared to other investments even with the tax savings factored in. Most investment professionals would agree that life insurance should not be used solely as an investment tool and you should judge your policy choices on the protection offered and not on the rate of return. But if you are in need of life insurance the tax benefits and cash value is an added bonus when purchasing protection for your loved ones.

Unit Linked Insurance Plans

A Unit Linked Insurance Plan (ULIP) is a bundled product that combines a life cover with an investment plan. The investment is not guaranteed money back or endowment lump sum, but works like a mutual fund. The premiums go towards mortality charges and the rest, after costs, gets invested in different plans according to the amount of risk one is willing to take.

Choices range between zero percent equity and full debt products to a 100% equity option. If one survives the policy term or redeems it midway, one gets the net asset value multiplied by the number of units one holds. The net asset value will depend on the performance of the corpus that the insurance company manages just like that of a mutual fund.

In case of death the dependent receives either the sum assured or the value of the fund, whichever is higher. The actual return in a ULIP would largely depend on three factors—charges, management of fund and the market condition. Apart from the premium allocation charge that may range between to 10% to 70% of the first year's premium, another very important and mostly understated charge is the Fund Management Charge (FMC).

ULIP being long term in nature, the FMC plays a major role in building wealth through compounding. This charge is for managing the investments and is directly adjusted to the net asset value of the fund, as and when it is declared. Look out for the plan that charges the lowest fund management expenses. A much better way to determine the best ULIP for you is to get illustration figures from the companies based on same parameters to compare the maturity value. To single out the best, go with the one that has given consistent returns over the last few years.

Switching between fund options of a ULIP as per your risk appetite, market condition and age is equally important in generating a decent corpus over a long term. ULIPs work for those who are unable to systematically invest each year in pure investment products while staying with a term plan for cover. ULIP can be considered as a tool for retirement planning if a person cannot invest systematically and in a disciplined manner. ULIP's work well if the time horizon of investment is more than 12–15 years.

6.10 PENSION PLANS

Pension plans are the reverse of life insurance plans. In a pension plan one has to fix the retirement age also called the vesting age — the age when one wishes to have a regular income in the form of pension. One has to maker regular contributions during the earning years and then gets a regular pension after a certain number of years.

Insurance companies offer two kinds of pension plans—endowment and unit linked. Endowment plans invest in fixed income products so the rates of return are very low. Unit linked plans are better as they are more flexible (you can stop contributing after 10 years and the fund will keep compounding your corpus till the vesting date) and invest in stock markets (though lower risk options like balanced funds are also on offer). In a ULIP policy the company will invest your money in one of the options selected by you, i.e. it can be pure debt, balanced (equity and debt both) or it can be pure equity. ULIPs are considered to be an instrument for long-term wealth creation.

It is always advisable to buy a pure term insurance plan for protection and to buy a pure pension plan for the purpose of getting regular pension and maximize returns after retirement. One should choose a plan that offers the maximum projected maturity value since that will be the basis of the regular pension.

The final value depends on costs, fund management and market performance over the years. While the last two are not directly under your control, you can shop around to find the plan with the highest projected maturity value and the lowest costs.

A little-known option is that after retirement you can ask your company to transfer all the funds to another that gives a higher pension, at no extra cost.

Contributions to these plans give you tax breaks under section 80C but pension income is taxable. If you compare this with the tax free corpus that a diversified equity fund gives, then these plans look less attractive. But to accumulate money through a diversified equity fund for retirement, one should have the discipline to invest systematically either through the SIP route or through disciplined investment through voluntary accumulation plans. If this discipline cannot be maintained by an individual then one can stay with these pension products.

6.11 VARIOUS PRODUCTS OF MUTUAL FUNDS

Mutual funds are the best avenues for investment, and accumulation and growth of wealth of individuals. By investing in a variety of schemes of mutual funds which suit the goals of individuals, investors can take the benefit of the professional expertise of the mutual fund manager. A small amount of money gets diversified across various companies and sectors and there is also the benefit of economies of scale for costs.

Various avenues of investment are discussed in detail in the section on mutual funds. A financial planner has to be aware of all the products available in the market (insurance, mutual funds, banks, post offices, RBI, etc.); only then can he recommend those products which suit the needs of the clients.

Also the time horizon of investments has to match with the time horizon of goals. While recommending any investment to the client, the time of requirement of money has to be looked into. A time horizon of 4 years will require the money to be invested in a scheme from which money can be easily withdrawn after four years. If money is invested in RBI 8% (taxable) bonds and the client requires money after 4 years and the financial planner knew this at the time of investment, it is a blunder as money cannot be withdrawn from RBI bonds before maturity of 6 years. Therefore, a thorough understanding of all the products available, their risk and return attributes, their suitability to the clients need in terms of risk appetite of the clients, etc. have to be studied carefully before recommending any specific scheme to clients.

6.12 REVERSE MORTGAGE

Reverse mortgage has recently been announced by the government wherein a retired couple can generate regular cash flows from their house by borrowing against it to meet their living expenses. They will continue to stay in their home as long as both are alive. The mortgage company will sell the property after their death and recoup the investment.

Reverse mortgage is also one of the options for providing regular income after retirement. Those couples who have either no children or have children who are not in a position to support them financially, and who are themselves running out of accumulated savings, may consider this as a good option.

In terms of financial language reverse mortgage can be defined as, "an agreement by which a home owner borrows against the equity in his home and receives regular tax-free payments from the lender." Here equity is the value of the property over and above any mortgage or other liabilities relating to it. Thus, reverse mortgage is a contract between a home owner and a financier that enables the homeowner to receive a stream of income, especially in retirement, from the future realizable value of the home.

The genesis of reverse mortgage can be traced to developed countries where due to higher standards of living, better access to health care and higher life expectancy, people above 65 years constitute a major chunk of the population. The ever-rising cost of pensions and health care for the old led insurance companies to introduce the reverse mortgage in the US, the UK and Australia.

In reverse mortgage, the capital value of a home is converted into an annuity over the home owner's lifetime. The annuity may be designed to rise, fall or stay steady over the lifetime. The period of such payments is not 'a specified number of years, but 'the remaining lifetime of the owner (and his/her spouse) of the property.' Simply put, reverse mortgage is a life annuity.

Thus, by investing in a house through a housing loan and repaying the loan during his working life, one will not only have a roof over his head throughout his life but also secure a joint life pension that keeps in step with inflation after retirement. Seen in this perspective, reverse mortgage would motivate people to build or buy their homes and thereby, save for their retirement voluntarily. Hence, reverse mortgage spurs economic activity and provides economic security.

How reverse mortgage works

Mr. Gupta retired after having a very fulfilling career with a leading private sector bank. His only daughter is married and well settled in Mumbai. He owns a large house in Delhi that is worth about Rs. 75 lakh but he has limited savings (including PPF and EPF) of Rs. 12 lakh to generate any major income.

He is not expecting any pension either. His worry now is to pay for his modest monthly expenses of Rs. 22,000. His financial assets can at best generate Rs. 12,000 per month and the income thus generated will not keep pace with inflation. Thus, after five years when he will require Rs. 28,000 per month his financial assets will still generate only Rs. 12,000 per month.

The only option he had earlier was to rent his house and move to a smaller house himself or to sell his house and buy a smaller house and invest the proceeds to earn a higher monthly income. This is where reverse mortgage can be of great value.

Budget 2007 has given a green signal to the launch of reverse mortgage, an instrument widely used in the developed world by the elderly to derive cash flows from their own house.

The popularity of the instrument lies in that it converts an illiquid asset—the house—into liquid cash flows for the owner, typically a senior citizen. A more attractive feature is that senior citizens can continue to live in their house even after drawing cash flows from it.

Reverse mortgage as its name indicates, operates in a manner opposite to that of the typical mortgage such as a home loan. In a typical mortgage, you borrow a lump sum of money at the very beginning and then pay it back over a period of time. In the payback—the EMI—a portion goes towards paying the interest and the remaining goes towards paying back the principal.

All along, you pledge the asset namely, the home you have bought with the loan to the bank. This asset is the security against which the bank is lending to you. In reverse mortgage, you pledge a property you already own (with no existing loan outstanding against it). The bank in turn gives you a series of cash flows for a fixed tenure. These can be thought of as reverse EMIs.

Here are some of the questions related to insurance which are asked by various clients.

1. Who should buy insurance and of what kind?

Insurance products provide protection against many of life's disastrous events. Everyone's portfolio should include short-term and long-term products. The exact need of the individual would determine what type of products he should buy. Each person should buy an adequate amount of cover to protect against life's uncertainties. He has to also channel savings into long-term instruments for his own retirement. Products will be selected for other goals depending on the time horizon of the goals. Insurance is an excellent long-term saving product for retirement planning.

Each person's insurance requirements are different and depend upon the investor's age, income level, preferences, risk profile and expected commitments. Insurance needs are specific to an individual depending upon his financial responsibilities and liabilities, pre as well as post retirement.

The best way to buy insurance is to do a need based analysis of the insurance requirement. After computing the amount of insurance required, the amount of existing investments should be deducted from that amount to come to the exact requirement. A person who has sufficient amount of investments to take care of needs of the family in case of any adversity need not buy a term insurance policy.

2. Insurance is not an investment? Is this true?

There are two components to a life insurance plan. One is financial benefit to the family, i.e. protection against loss of income in case of the death of the earning member. The other is the benefit to the policy holder in case he survives the policy term. Life insurance companies have products which serve as pure

protection cover and both protection and investment. Investors have to match their goals and time horizon with the objectives and suitability of the scheme.

3. Which is the best life insurance plan which offers saving cum protection for a very small investor with very low risk tolerance?

A small investor with a very low risk appetite can start with a whole life plan. Such a policy provides a cover for protection and saving. These policies also offer the flexibility to make changes in the policy as per changing needs. The policy holder also has the flexibility to choose between fund options depending upon the risk appetite.

4. Is investing in Mutual Funds better than investing in ULIP's?

To resolve this issue of comparison we have to study the goals of investors and the time horizon of investments. In case of mutual funds, the time horizon can be short, medium or long term. There is also no element of life insurance coverage (protection) and.no tax benefit except in the case of equity linked saving schemes.

In case of ULIP's there is an element of saving as well as investment. A person who invests in ULIP also gets a tax benefit under section 80C. In ULIP's an investor can choose the options (conservative, balanced, aggressive) depending on his risk appetite and the conditions prevalent in the market. He can also switch between options without incurring any additional cost. But again, a very important factor is that ULIP is for a long term. There are many innovations in various products. The investor has to select that investment which suits his needs and which can enable him to achieve his goals.

CHAPTER

7

Solved Numericals on Retirement Planning

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- *Simple questions with solutions*
- *Questions involving 3 steps*
- *Practice questions with answers on retirement planning*

QUESTIONS ON RETIREMENT PLANNING

1. Mr. Rao is able to save Rs. 10,000 per month at the beginning of every month. He joined his current service on 1 January, 1990 and will retire on 1 January, 2010 at the age of 60. He would like to provide for another 25 years after his retirement. He assumes that average interest rate on his monthly accumulations will be 9% per annum throughout this period and the compounding will be done monthly. What will be his total accumulations at age 60 and how much can he withdraw at the beginning of every month if he dies at age 85 and leaves behind no estate?

Solution: This question will be answered in two steps.

Step 1: We have to find out the accumulated sum at age 60 when he retires.

–10000 = Pmt

Bgn

9/12 = *i*

20 × 12 = *n*

Compute FV = Rs. 67,28,960

Step 2: We have to find out what amount can be withdrawn monthly at the beginning of every month for 25 years.

–67,28,960 = PV (The amount invested at age 60 for withdrawal every month)

Bgn

9/12 = *i*

25 × 12 = *n*

Compute Pmt = Rs. 56,049 per month

If he survives for 25 years after retirement he can withdraw Rs. 56,049 at the beginning of every month and the entire money will be exhausted at the end of 25 years. He will not be leaving any estate for the next generation.

2. In the previous question if the savings are decreased to Rs. 8,000 per month at the beginning of every month and the rate of erosion (withdrawal) maintained,, and if the return on investment is 10% per annum; how long will the money last?

Solution: This question will also be answered in two steps:

Step 1: We have to find out the accumulated sum at age 60 at the rate of return of 10% p.a. compounding monthly. The amount saved per month is Rs. 8,000 p.m.

–8000 = Pmt

Bgn

20 × 12 = *n*

10/12 = *i*

Compute FV = Rs. 61,25,575

Step 2: We have to find the number of years that the money will last if the amount withdrawn is the same each month?

–61, 25,575 = PV

Bgn

56049 = Pmt

10/12 = *i*

Compute *n* = 281.40 months

If we divide this number by 12 we get 23.45 years. Although the person has started saving Rs. 2,000 less every year, the money will last for 23.45 years — less by 1.55 years only — because the money has been invested at the return of 10% p.a.

Financial planners can educate their clients about increasing their risk appetite to increase their wealth fast. Again, a note of caution is to select good performers, track their investments, monitor their portfolios and review their plans regularly.

The remaining amount of Rs. 2,000 per month if invested at an average return of 12% per annum in diversified equity can become Rs. 3.39 crore as estate for the next generation. The calculation is as follows.

Let us calculate the amount of estate built by Mr. Rao if he invests Rs. 2,000 at the beginning of every month in diversified equity which generates a return of 12% p.a.

–2000 = Pmt
Bgn
12/12 = i
20 × 12 = n

Compute FV = Rs. 19,98,296. (The accumulated sum at age 60).This amount will be invested for 25 years at a rate of 12% p.a.

– 1998296 = PV
12 = i
25 = n

Compute FV = Rs. 3,39,71,160

A saving of Rs. 2,000 per month in a disciplined manner has generated a good amount of money for the next generation.

3. Mr. Ahmed has been saving Rs. 2,00,000 every year for the last 10 years. This money has been invested in a diversified equity scheme which gives an average return of 14.25% p.a. He has stopped saving in this account and has started saving Rs. 15,000 per month through 3 SIP's (systematic investment plans) for 3 years. The average return on these 3 investments is 12.75% per annum, convertible monthly. How much will be accumulated from both the investments after 3 years?

Solution: In this question there are two investments. The first investment is of Rs. 2,00,000 per year for 10 years and the second investment is of Rs. 15,000 per month for three years.

1st Investment –200000 = Pmt
10 = n
14.25 = i

Compute FV = Rs. 39,14,845 (Accumulated amount after 10 years)

This amount will be further invested for a period of 3 years @14.25% p.a. return and will accumulate to:

–3914845 = PV

14.25 = i

3 = n

Compute FV = Rs. 58,38,257 (1)

2nd investment of Rs. 15,000 per month will accumulate to:

–15000 = Pmt

3 × 12 = n

12.75/12 = i

Compute FV = Rs. 6,53,633 (2)

Total accumulated amount = (1) + (2)

= Rs. 64,91,890

4. Mr. Bhaskar aged 43 recently got an assignment to the Middle East for a period of 12 years. He is planning to save Rs. 12,00,000 every year while he is on this assignment. The return expected on investment is 12.50% p.a. throughout the phase of 12 years. After this assignment is over, he wishes to enjoy a retired life in his home town. His life expectancy is 75 years. After coming back to India he has to spend a total amount of Rs. 50 lakh on his daughter's marriage, son's marriage and renovation of his house. The remaining amount will be kept aside for retirement.

(a) How much amount will be accumulated in 12 years?

(b) How much can he spend per month if he survives up to 75 years of age and the return on investment is 8% per annum, convertible monthly

(c) For how long will the money last if he spends Rs. 50,000 per month after retirement?

Solution:

(a) –12, 00,000 = Pmt

12.50 = i

12 = n

Compute FV = Rs. 2,98,54,950

Out of this money an amount of Rs. 50 lakh will be spent

Remaining amount = Rs. 2,98,54,950 – 50,00,000 = Rs. 2,48,54,950

(b) –2, 48, 54,950 = PV

Bgn

20 × 12 = n

8/12 = i

Compute Pmt = Rs. 2,06,520

(c) The money will last forever as he spends only Rs. 50,000 per month which is much less than the 8% interest on Rs. 2,48,54,950.

Interest @ 8% p.a. is Rs. 19,88,396/12 = Rs. 1,65,700. If he spends Rs. 1,65,700 per month then also he will be using only the interest; the principal will remain intact.

5. Mr. Damodaran is 55 years old and will be retiring from government service at age 60. He has provided for all the goals and has now contacted a financial planner to help him in retirement planning. He has already accumulated Rs. 25,00,000. He would like to invest an amount of Rs. 2,40,000 every year for the remaining 5 years. The investment generates a return of 12% p.a. What amount will be available as a nest egg? How much can he withdraw every month if he survives for 20 years more?

Solution:

Step 1:

–25,00,000	= PV
–2,40,000	= Pmt
12	= *i*
5	= *n*

Compute Future Value = Rs. 59, 30,537

Step 2:

–59,30,537	= PV
	Bgn
20 × 12	= *n*
12/12	= *i*
Compute Pmt	= Rs. 64,654

6. Mr. Sharma has approached you to make an efficient retirement plan for him. He is 45 years old and wishes to retire at age 58. He has saved for all the other goals and has also built his own house. He can save Rs. 20,000 per month for the remaining 13 years of his service and wishes to spend Rs. 65,000 per month after retirement. The return on investment is assumed to be 10% p.a. convertible monthly. For how many years can he survive with the money if he withdraws Rs. 65,000 per month?

Solution: This question will be solved in two steps. First we have to find out what will be his nest egg (accumulated savings) at age 58.

Step 1:

–20000	= Pmt
10%/12	= *i*
13 × 12	= *n*
Compute FV	= Rs. 63,59,002

Step 2:

–6359002	= PV
	Bgn
65000	= Pmt

10%/12 = i

Compute n = 199.18 months or

199.18/12 = 16.59 years

7. In the previous question how much should he withdraw every year so that the money lasts forever?

Solution: If the money has to last forever then he must withdraw only the interest equivalent and the principal should remain untouched.

10% of Rs. 63,59,002 = Rs. 6,35,900. He can withdraw Rs. 6,35,900 per annum and put it in a bank account from where he can withdraw Rs. 52,992 per month.

8. Mr. Abhishek has been saving Rs. 9,500 at the beginning of every quarter for 25 years at an average return of 14% p.a. compounded quarterly. Out of the accumulated sum he has to set apart Rs. 15,00,000 for his daughter's marriage and Rs. 10,00,000 for his son's marriage. Both the children are 4 and 2 years old respectively at present and he is saving separately for their education. Out of the remaining sum he wishes to withdraw a certain amount for the next 25 years. The money accumulated will be invested at a rate of 8% p.a. How much can he withdraw at the beginning of every year?

Solution:

Step 1: We have to find out the amount accumulated in 25 years.

–9500 = Pmt

25 × 4 = n

(14%/4) = 3.5 = i

Compute FV = Rs. 81,94,811

Step 2: Out of this amount he has to set apart a sum of Rs. 25,00,000 for his children's marriage. The remaining amount of Rs. 56,94,811 will be invested at a return of 8% p.a. We have to find out how much money he can withdraw every year if he wishes to withdraw for the next 25 years?

–56, 94,811 = PV

Bgn

25 = n

8 = i

Compute Pmt = 4,93,966

He can withdraw Rs. 4,93,966 every year for the next 25 years after his retirement and the money will then be exhausted.

9. Mr. Manoj has been saving Rs. 15,000 per month for the last 5 years and will continue to save the same amount for the next 15 years for his retirement at age 60. The return on investment is 12% p.a. convertible monthly. If he withdraws Rs. 45,000 per month after retirement (after 15 years) for the next 20 years, how much estate he will leave behind at age 80?

Solution:

Step 1: We have to find out the amount accumulated at age 60, i.e. after 15 years.

–15000 = Pmt

20 × 12 = *n*

12%/12 = *i*

Compute FV = Rs. 1,48,38,830

Step 2: We have to find out how much amount should be invested at a rate of 12% p.a. at age 60 in order to withdraw an amount of Rs. 45,000 per month for the next 20 years.

45000 = Pmt

12%/12 = *i*

20 × 12 = *n*

Compute PV = –4086874

If Rs. 40,86,874 is invested at a rate of 12% per annum, it will provide him with a regular income of Rs. 45,000 per month and the whole amount will be exhausted after that.

Step 3: Out of Rs. 1,48,38,830 only an amount of Rs. 40,86,874 is required for generating the required income after retirement. The remaining amount of Rs. 1,07,51,956 that is available at age 60 will grow for 20 years at the rate of 12% per annum and will become an estate for the next generation.

–1, 07, 51,956 = PV

12 = *i*

20 = *n*

Compute FV = Rs. 10,37,16,519

A systematic saving of Rs. 15,000 per month will leave an estate of Rs. 10.37 crore, after providing sufficiently for the retirement of the investor. In this case, he has invested his money after retirement also at 12% per annum and not in instruments providing a return of only 8% p.a. This means that he has made proper asset allocation between equity and debt.

10. Mr. Rane is 58 years old and has recently retired as GM from a private sector telecom company. His total investments at present are Rs. 78,00,000. His children are well settled and married. He wishes to leave an estate of Rs. 5 crore for his grandchildren when he dies at age 85. If he invests his money at a return of 10% p.a. how much can he withdraw every year and still leave an estate of Rs. 5 crore for the next generation?

Solution: In the first step we have to find out how much he has to set apart out of Rs. 78,00,000, which if invested at a rate of 10% p.a. will automatically become Rs. 5 crore.

5,00,00,000 = FV
10 = *i*
27 = *n*
Compute PV = Rs. 38,13,884

Out of Rs. 78,00,000, Rs. 38,13,884 will be set apart for estate building and the remaining amount of Rs. 39,86,116 can be invested to generate a regular income for him till he is 85.

–39, 86,116 = PV
Bgn
10 = *i*
27 = *n*
Compute Pmt = Rs. 3,92,298

He can withdraw an amount of Rs. 3,92,298 for the next 27 years and the entire amount of money will be exhausted.

QUESTIONS ON RETIREMENT PLANNING WHICH INVOLVE THREE STEPS

1. Mr. Gupta who is 30 years old spends Rs. 2,00,000 p.a. to maintain his living standard. He is working in a private company and will retire at age 60. Inflation is assumed to be 5% throughout the phase of 50 years, i.e. 30 years of service and 20 years after retirement. If he wants to maintain the same standard of living even after retirement, how much should he save every month if the rate of interest is assumed to be 8% p.a.?

Solution: This question will be solved in three steps.

Step 1: We have to find out how much will be required at age 60 to maintain the same standard of living.

–200000 = PV
5 = *i*
30 = *n*
Compute FV = Rs. 8,64,388

Step 2: The second step is to calculate the amount to be invested at age 60 which will enable him to withdraw an amount of Rs. 8,64,388 for the next 20 years. The PV at age 60 which will take care of his needs from age 60–80 has to be calculated. The rate of return here will be the real rate of return as he has to meet an inflation rate of 5% p.a. and the rate of return on investment is 8% p.a. Real rate will be = $(1.08/1.05)–1 \times 100 = 2.86\%$

8,64,388 = Pmt
Bgn
20 = *n*

2.86 = *i*

Compute PV = Rs. 1,34,00,556

If he invests Rs. 1,34,00,556 at age 60, he can withdraw Rs. 8,64,388 per annum after adjusting for inflation for the next 20 years.

Step 3: Now we have to calculate the amount to be invested every year for 30 years starting from now in order to accumulate Rs. 1,34,00,556.

13400556 = FV

30 × 12 = *n*

8%/12 = *i*

Compute Pmt = Rs. 8,991.49

If he invests Rs. 8,991 per month, he can achieve the goal of maintaining the same standard of living even after retirement.

Important In the first step, inflation rate will be used to increase the amount of expenses up to retirement. In the second step, real rate (adjusted for inflation) will be used to calculate the amount of nest egg required at age 60. Also, the amount is required at the beginning of every year after retirement. In the third step, we will use the rate of return on investment to compute the amount of investment required per month.

2. The current household expenses of Mr. Ankush who is 40 years old are estimated to be Rs. 30,000 p.m. He wishes to maintain the same standard of living after retirement at age 60. His life expectancy is assumed to be 80 years. If the average inflation rate is assumed to be 5% per annum and the return on investment is 9% per annum how much does he have to invest every month to meet his goal of a comfortable retired life?

Solution:

Step 1: We have to calculate the amount required at age 60 to maintain the same standard of living.'

360000 = PV

5 = *i*

20 = *n*

Compute FV = 955187

Step 2: To compute the amount of nest egg required at age 60

955187 = Pmt

Bgn

20 = *n*

3.81 = *i*

Compute PV = 13705482

Step 3: The amount has to be invested every month to make it Rs. 1,37,05,482 in 20 years, i.e. at age 60

13705482 = FV
9%/12 = *i*
20 × 12 = *n*
Compute Pmt = Rs. 20,520.66

He has to invest Rs. 20,520 every month at a return of 9% to have the comfortable retired life desired by him. If he cannot save this amount of money every month as he has to save for other goals also, he will have to invest money in other investment avenues which generate a higher rate of return. But he has to select his investments very carefully.

3. Mr. Ramalingam is 50 years old. He has provided for all the goals except retirement. He will retire after 8 years. He spends Rs. 20,000 per month and wishes to have the same standard of living after retirement. His life expectancy is assumed to be 78 years. He will get a pension income of Rs. 15,000 per month. He has approached a financial planner to make a retirement plan for the balance required amount. Inflation rate is 5.5% p.a. and he invests money at an average return of 12.5% p.a. How much does he have to invest per month to make good the goal of retirement?

Solution:

Step 1: In the first step we have to calculate the amount that will be required for expenses at age 58 and the deficit amount.

–20000 = PV
5.5%/12 = *i*
8 × 12 = *n*
Compute FV = Rs. 31,023

Step 2: Of the total amount required, Rs. 15,000 per month will be provided by the employer in the form of pension. The required amount per month is: 31023 – 15000 = Rs. 16,023. This amount is required per month at the beginning of every month for 20 years after retirement. We have to compute the PV required at age 58.

16023 = Pmt
Bgn
6.635%/12 = *i*
20 × 12 = *n*
Compute PV = –2138114

Step 3: This amount has to be accumulated in 8 years by saving monthly.

2138114 = FV

8 × 12 = *n*

12.5%/12 = *i*

Compute Pmt = Rs. 13,068.45

4. Ms. Rehana is 35 years old and has no plans to marry. She freelances and her monthly income is not a fixed amount. But her expenses are fixed. She spends Rs. 2,16,000 per annum and expects her expenses to increase by 2% above inflation every year till she retires as she is not satisfied with her present standard of living. She is staying in her own house built by her father. She has approached you for making a retirement plan for her. Depending on the required amount of savings to be made by her as suggested by you, she will try to increase her source of income. She wishes to retire at age 50 and life expectancy is assumed to be 72 years. Inflation rate is assumed to be 5% throughout the phase and average return on investments will be 14% p.a. Make a retirement plan and advise her about the amount she needs to invest each month in order to achieve this goal?

Solution:

Step 1:

–216000 = PV

7% = *i* (5% inflation + 2% increase)

15 = *n*

Compute FV = 595951

Step 2:

595951 = Pmt

Bgn

8.5714% = *i* (real rate = (1.14/1.05)–1 × 100)

22 = *n*

Compute PV = Rs. 63,12,405

Step 3:

6312405 = FV

14%/12 = *i*

15 × 12 = *n*

Compute Pmt = Rs. 10,420.18

She has to invest Rs. 10,420 per month to accumulate a sufficient amount which can take care of her needs after retirement.

5. Mr. Armaan has a job assignment in Muscat for 5 years which can be further extended depending on his willingness to work there. He has approached you and requested you to make a plan so that he can accumulate sufficient money to take care of his post-retirement needs and to spare Rs. 20,00,000 for estate building. He has provided you the following information:

Age = 50 years. Amount he can save every year = Rs. 10,00,000. Present annual living expenses = Rs. 3,00,000. His expenses after retirement will be only 75% of the expenses before retirement. Inflation rate is 5% throughout and return on investment will be 11% p.a. His life expectancy is 80 years.

In how many years he can come back to India and enjoy a retired life? Five years is the minimum period of service; can he come back to India after 5 years?

Solution:

Step 1: Firstly, one should compute the amount of expense required after 5 years assuming that he wishes to come back to India after 5 years.

–300000 = PV
5 = *i*
5 = *n*
Compute FV = Rs. 3,82,884
75% of this amount = Rs. 2,87,163

Step 2: The next step is to compute the amount required for the retirement corpus.

287163 = Pmt
Bgn
5.7143% = *i*
25 = *n*
Compute PV = 3988296

Step 3: We now have to find out if he can accumulate a sufficient amount for retirement as well as Rs. 20 lakh for estate building if he saves Rs. 10 lakh every year for 5 years.

1000000 = Pmt
5 = *n*
11% = *i*
Compute FV = 6227801

His accumulated savings will be Rs. 62,27,801. After providing Rs. 20,00,000 for estate building he will be left with Rs. 42,27,801. The required amount for retirement is Rs. 39, 88,296. Therefore he can come back to India after completion of the 5-year term.

Answer Question numbers 6–8 from the information given below.

Mr. Sharma aged 30 years is working as a senior analyst with annual current earnings of Rs. 8,00,000. He bought a house with a loan amount of Rs. 20,00,000 to be paid in the next 15 years with an interest rate of 8% per annum, assuming that he is saving at the end of the year and making the

installment payment of the loan also at the end of the year. He wishes to save 20% of his salary after payment of EMI every year. His other savings amount to Rs. 7,50,000 which is generating a return of 10% p.a. Assume that his salary is constant for all the years.

Solution:

6. Compute the amount of EMI on the housing loan.

–2000000 = PV
8 = i
15 = n
Compute Pmt = 2 33659

7. What would be the amount of his accumulated savings if he retires at the age of 60?

(a) Earlier savings:

–750000 = PV
10 = i
30 = n
Compute FV = 13087052 (1)

(b) Annual savings after payment of EMI will be 800000 – 233659 = Rs. 5,66,341

20% of Rs. 5,66,341 = Rs. 1,13,268.20

–113268.20 = Pmt	–3598811.11 = PV
15 = n	15 = n
10 = i	10 = i
Compute FV = Rs. 35,98,811.81	Compute FV = Rs. 1,50,33,130.04

(2)

(c) After payment of loan for 15 years, he can save more on an annual basis.

20% of Rs. 8,00,000 = Rs. 1,60,000

–160000 = Pmt
10 = i
15 = n
Compute FV = Rs. 50,83,597.07 (3)

Accumulated amount of savings = (1) + (2) + (3)
= 13087052 + 15033130 + 5083597
= Rs. 3,32,03,779

8. In the previous question, what would be the amount of accumulated savings if he plans to retire at age 55?

Solution:

Step 1: Rs. 7,50,000 will now grow for 25 years instead of 30 years.

–750000 = PV
25 = *n*
10 = *i*
Compute FV = Rs. 81,26,029.45 (1)

Step 2: Annual salary after payment of EMI is 800000 – 233659 = Rs. 5,66,341

20% of Rs. 5,66,341= Rs. 1,13,268.20

–113268.20 = Pmt	–3598811.81 = PV
15 = *n*	10 = *n*
10 = *i*	10 = *i*
Compute FV = Rs. 35,98,811.81	Compute FV = Rs. 93,34,390.97

(2)

Step 3: For the next 10 years, he will save 20% of Rs. 8,00,000 = Rs. 1,60,000

–160000 = Pmt
10 = *n*
10 = *i*
Compute FV = Rs. 25,49,987.93 (3)
Total accumulated amount = (1) + (2) + (3)
= 8126029.45 + 9334390.97 + 2549987.93
= Rs. 2,00,10,408

9. Mr. Arpit is 35 years old and has started a programme of depositing Rs. 20,000 at the beginning of each year in a deferred annuity scheme as part towards his retirement plan. How much will be in the account:

(a) After 11 years if it earns 8.5% compound annual interest?
(b) After 13 years if it earns 8.5% compound annual interest?
(c) After 18 years if it earns 8.5% compound annual interest and he stops making contributions after the fifth deposit?

Solution:

(a) After 11 years:

–20000 = Pmt
Bgn
11 = *n*
8.5 = *i*
Compute FV = Rs. 3,70,985

(b) After 13 years:

–20000 = Pmt
Bgn
13 = n
8.5 = i
Compute FV = Rs. 4, 81,977

(c) After 18 years:

–20000 = Pmt
Bgn
5 = n
8.5 = i
Compute FV = Rs. 1, 28,581

–1, 28,581 = PV
13 = n
8.5 = i
Compute FV = Rs. 3,71,333

After 18 years he will be able to accumulate Rs. 3,71,333

10. Mr. Akshay is able to save Rs. 6,000 per month. He is 30 years old and will retire at age 60. He would like to provide for another 20 years after his retirement. He assumes an interest rate of 11% on his investments throughout the total phase, i.e. 30 years of service period and life after retirement.

(a) What will be the accumulated amount at age 60?
(b) How much can he withdraw every month if he lives for another 20 years and leaves behind no estate?
(c) If he spends Rs. 1,55,000 per month, how long will the money last?
(d) If he spends the above amount every month and dies at age 80 what estate will he leave behind?

(a) Accumulated amount at age 60:

–6000 = Pmt
30 × 12 = n
11/12 = i
Compute FV = Rs. 1,68,27,118

(b) How much can he withdraw every month?

–1,68,27,118 = PV
20 × 12 = n
11/12 = i
Compute Pmt = Rs. 1,73,687.55

(c) If he spends Rs. 1,55,000 per month, till when the money will last?

–1, 68, 27,118 = PV
1, 55,000 = Pmt
11/12 = i
Compute n = 584 months or 48.67 years

(d) If he spends Rs. 1,55,000 per month and lives for 20 years after retirement, how much estate will he leave behind?

To get Rs. 1,55,000 per month for 20 years, how much money should be available at age 60?

1,55,000 = Pmt
20 × 12 = *n*
11/12 = *i*
Compute PV = Rs. 1,50,16,638

Out of an accumulated amount of Rs. 1,68,27,118 only Rs. 1,50,16,638 is the amount that is required at age 60 to generate an amount of Rs. 1,55,000 per month for the next 20 years. The remaining amount of Rs. 18,10,480 at age 60 will grow for 20 years and would become:

–18,10,480 = PV
20 = *n*
11 = *i*
Compute FV = Rs. 1,45,96,653

11. Mr. Somesh currently spends Rs. 2,40,000 per annum to maintain his living standard. He is 25 years old and wishes to retire at age 55. After that he intends to do social service till his health allows. He requires only 80% of his last spend after retirement. Return on investments is 12% per annum and inflation rate is 6% p.a. How much should be saved every month if life expectancy is assumed to be 75 years?

Solution:

Step 1: To find out how much will be required at age 55 for annual expenses:

–2, 40,000 = PV
30 = *n*
6 = *i*
Compute FV = Rs. 13,78,437
80% of the last spend = Rs. 11,02,750

Step 2: This amount is required every year for the next 20 years at the beginning of every year.

11 02750 = Pmt
Bgn
20 = *n*
5.66 = *i*
Compute PV = Rs. 1,37,41,192

Step 3: The saving to be made every month in order to accumulate Rs. 1,37,41,192 at age 55 is:

1,37,41,192 = FV
30 × 12 = *n*
12/12 = *i*
Compute Pmt = Rs. 3,931.71

PRACTICE QUESTIONS ON RETIREMENT PLANNING — 1

Question Numbers 1–5 are interlinked

1. Ramesh is 40 years old and has already saved Rs. 9,00,000 per annum for the last 3 years while on deputation to UK. He would be able to save the same amount every year for the next 8 years. After that he will come back to India and has plans to leave his job and lead a retired life. His savings earn a return of 9% p.a. Inflation rate is 5% throughout the phase. How much will be accumulated by him on returning to India?

2. In the previous question, how long will the accumulated savings last if inflation rate is 5% and the family spends Rs. 6,60,000 in the first year after his retirement? The money is required by the family in the beginning of the year.

(*Hint:* The expenses in the first year are Rs. 6,60,000 which will keep increasing at the rate of inflation. Therefore, the real rate will be used here (3.8095%). After retirement it is assumed that the money is required at the beginning of the month or year)

3. In this case, how much can Ramesh spend at the beginning of every year if money is required for 25 years after retirement, i.e. life expectancy is 25 years after retirement?

4. Also, if he spends Rs. 25,00,000 on renovation of his house in India after he returns, how much can he spend if money is required for 25 years after retirement?

(*Hint:* Money available for investment is 15804264 – 2500000 = Rs. 13304264)

5. If in the same question, the couple spent Rs. 4,50,000 in the first year after retirement and Ramesh lives for 25 years and his wife lives for another 10 years, how much money will be available with his wife when Ramesh dies after 25 years of retired life?

Solution: If the couple requires Rs. 4,50,000 per annum at the beginning of every year, we have to first find out how much will be required at the time of retirement in order to generate the required income?

Step 1:

4,50,000 = Pmt
Bgn
25 = *n*
3.8095 = *i*
Compute PV = Rs. 74,46,932

Step 2: Now only Rs. 74,46,932 is required for the couple at the time of retirement to generate the required flow of money. They have already accumulated Rs. 1,58,04,264. The remaining amount of Rs. 83,57,332 will be invested at the time of retirement and grow at the rate of 9% p.a.

–83, 57,332 = PV
9 = i
25 = n
Compute FV = Rs. 7,20,65,948

Question Numbers 6–10 are interlinked

6. Mr. Jha is 45 years old and has been saving Rs. 12,000 every month for the last 5 years for his retirement. He intends to continue investing the same amount every month for the remaining 15 years of his working life. He has provided very well for the other goals of his life. The rate of return on investments is 10% p.a. What will be the accumulated amount at the time of retirement at age 60?

7. How much can he spend every month if he assumes he will live for 20 years after retirement and the money is required at the beginning of every month? The rate of return on investments is 10% p.a.

8. For how long will the money last if they spend Rs. 76,000 p.m. and the money is withdrawn at the beginning of every month. The rate of return on investment is 10% p.a.

9. If the couple spends Rs. 76,000 per month and Mr. Jha survives till the age of 80 and his wife survives for another 5 years after that, how much money can she withdraw every month at the beginning of every month for the remaining period of 5 years?

(*Hint:* The accumulated amount required at age 60 is Rs. 79, 41,100 and the surplus of Rs. 11,71,326 (9112426 – 7941100) will become Rs. 78,80,095. This amount can be invested further for 5 years and she can withdraw Rs. 1,66,045.

10. If the payment of Rs. 76,000 per month is required for 20 years only, how much estate will he leave behind if the rate of return is assumed to be 10% p.a.?

11. Raman has been saving for the past 5 years. He is aged 30. He puts in Rs. 40,000 in a year in PPF earning 8% p.a. He will retire at age 60. He expects to live another 20 years. Use annuity due in all calculations. What is the sum he will accumulate at retirement?

12. What is the sum he can use every year if he lives for another 20 years, leaves no estate and earns 6% return on his investment? He withdraws money at the beginning of the year.

13. If he retires 10 years earlier, how much does he have to save every year in order to maintain the same living standard?

Solution: If he retires 10 years earlier he will be saving for 25 years instead of 35 years and he will require money for 30 years after retirement, instead of 20 years.

We have to first find out how much accumulated amount is required at the time of retirement so that he can withdraw an amount of Rs. 5,66,919 per year.

Step 1:

5,66,919 = Pmt
Bgn
30 = *n*
6 = *i*
Compute PV = Rs. 82,71,757

Step 2: He has to accumulate this amount in 25 years with annual savings.

82, 71,757 = FV
25 = *n*
6 = *i*
Compute Pmt = 150767

14. Mr. Intelligent invested a sum of Rs. 10,00,000 each in bank FD and NSC. Their maturity values are: FD is Rs. 15,30,000 after 5 years and NSC is Rs. 14,80,244. What is the rate of return on both and which investment is better?

(*Hint:* Bank FD's give quarterly compounding and NSC gives half-yearly compounding)

15. An employee who joined service at the age of 30 with a salary of Rs. 3,00,000 per annum saves 10% of his salary every year and this is invested at a return of 12% p.a. If his salary is expected to grow by 5% every year, how much money will he have on retirement at the age of 60 years?

(*Hint:* This is a question of growing annuity) FV = Pmt {(1.12) ^30 – (1.05)^30/ 1.12 –1.05}. This calculation is also explained with the help of Excel after the answers.

16. Sudhakar estimates his opportunity cost on investments to be 10.5% compounded annually. Which one of the following is the best investment opportunity for him?

(a) Rs. 1,20,000 after 10 years
(b) Rs. 45,000 today
(c) Rs. 5,500 at the end of each year for 19 years
(d) Rs. 5,500 every year at the beginning of each year for 15 years

(*Hint:* We have to compute the present value of all these options)

17. Mr. X deposited Rs. 50,000 in a diversified equity scheme of a mutual fund earning an average return (CAGR) of 20% per annum on 1 March, 1967. What amount would he get at retirement on 1 March, 2000?

(The money has been invested for 33 years.)

18. Vijay had been saving Rs. 5,000 at the beginning of every month for the last 5 years at an interest rate of 12% per annum compounded monthly. Now he has stopped saving and will retire after 5 years. How much money would he get on retirement?

19. Sajid, aged 44 can refinance his housing loan of Rs. 1,18,720 at a rate of 7% for 20 years. He will have to incur 3% as closing costs of the mortgage balance. What will be his new EMI on the mortgage under the circumstances to achieve his objective of no debt at retirement at age 60?

(Re-financing means converting the existing loan into a new loan at a revised (lower) rate of interest. Closing costs will be added to the outstanding loan amount.) The revised loan amount is Rs. 1,22,282 and will be paid in 16 years.

20. A financial advisor suggested that Mr. Raizada would require Rs. 10,000 per month on retirement to sustain his desired standard of living. If the inflation is expected to be 6% and Mr. Raizada's life expectancy is assumed to be 30 years after retirement, what will be the buying power of this amount after 30 years?

ANSWERS TO PRACTICE QUESTIONS ON RETIREMENT PLANNING — 1

BOX

Question Number	*Answers*
1.	Rs. 1,58,04,264
2.	Rs. 56.43 years
3.	Rs. 9,55,013
4.	Rs. 8,03,944
5.	Rs. 7,20,65,948
6.	Rs. 91,12,426
7.	Rs. 87,210
8.	566.44 months or 47.20 years
9.	Rs. 1,66,045
10.	Rs. 78,80,095
11.	Rs. 68,92,672
12.	Rs. 5,66,919
13.	Rs. 1,50,767
14.	8.60% on FD and 8% on NSC investment, so bank FD is better
15.	Rs. 1,09,87,706

16. Option (b) i.e.Rs. 45,000 today
17. Rs. 2,05,09,313.51
18. Rs. 7,26,846
19. Rs. 1,060.43
20. Rs. 1,741

Solution for Question Number 15 (Growing annuity)

Year	*Installment amount (Rs.)*	*Interest rate factor*	*No. of years of investment*	*FV*
1	30000	1.12	29	802497.9
2	31500	1.12	28	752341.8
3	33075	1.12	27	705320.4
4	34728.75	1.12	26	661237.9
5	36465.1875	1.12	25	619910.5
6	38288.44688	1.12	24	581166.1
7	40202.86922	1.12	23	544843.2
8	42213.01268	1.12	22	510790.5
9	44323.66331	1.12	21	478866.1
10	46539.84648	1.12	20	448937
11	48866.8388	1.12	19	420878.4
12	51310.18074	1.12	18	394573.5
13	53875.68978	1.12	17	369912.7
14	56569.47427	1.12	16	346793.1
15	59397.94798	1.12	15	325118.6
16	62367.84538	1.12	14	304798.7
17	65486.23765	1.12	13	285748.7
18	68760.54953	1.12	12	267889.5
19	72198.57701	1.12	11	251146.4
20	75808.50586	1.12	10	235449.7
21	79598.93115	1.12	9	220734.1
22	83578.87771	1.12	8	206938.2
23	87757.8216	1.12	7	194004.6
24	92145.71268	1.12	6	181879.3
25	96752.99831	1.12	5	170511.8
26	101590.6482	1.12	4	159854.9
27	106670.1806	1.12	3	149863.9
28	112003.6897	1.12	2	140497.4
29	117603.8742	1.12	1	131716.3
30	123484.0679	1.12	0	123484.1
				10987706

PRACTICE QUESTIONS ON RETIREMENT PLANNING—2

21. Mr. Rehman is aged 25 years and has been saving Rs. 30000 at the beginning of every year in a PPF account. He continues to save the same amount until his retirement at age 60 and earns 8% interest. He spends Rs. 30,00,000 on purchase of a house after retirement and earns 6% per annum interest on the saved amount. If his life expectancy is assumed to be 75 years, how much can he spend every year after retirement leaving no estate? The amount is withdrawn at the beginning of the year.

22. In the previous question if he wishes to spend Rs. 3,00,000 at the beginning of every year and interest rate is 6% per annum, how much additional amount will he have to invest every year in order to generate a return of 8% p.a. and enable him to spend the required amount leaving no estate?

(*Hint:* We have to first find out the total amount required at age 60 and then see the difference in saving that is required). The amount required is Rs. 60,88,495 (3088495 + 3000000)

23. A person starts saving Rs. 15,000 per annum from the age of 30. His retirement age is 58 years and his life expectancy is 80 years. If his investments earn an interest of 8.25% p.a. and the inflation rate is expected to be 5%, what amount would he have as a nest egg and how much can he spend every year after retirement, leaving no estate for his heirs?

24. How much should Reena, aged 25 years, save at the end of each year till her retirement at age 55 years so that she is able to spend Rs. 35,000 per month immediately on retirement. Her life expectancy is 70 years. The inflation is expected to be 4.5% and interest on investment is 9.5% p.a.

(Real rate is 4.78%. 1.095/1.045 – 1 × 100)

25. An employee aged 30 saves Rs. 1,00,000 at the end of every year until his retirement at age 60. His life expectancy is 80 years. Rate of return on investments is 10% p.a. and inflation rate is 5%. How much money can he withdraw at the beginning of every year to meet his requirements after retirement? He also wishes to leave an estate of Rs. 2,00,00,000 for the next generation.

Solution:

Step 1: First, we have to find out what will be the accumulated sum at age 60.

1,00,000 = Pmt

30 = n

10 = i

Compute FV = Rs. 1,64,49,402

Step 2: We have to find out how much money there should be at age 60—as he will be saving money only up to age 60 and that money will grow and become Rs. 2 crore—to leave an estate of Rs. 2 crore for the family.

20000000 = FV
10 = i
20 = n
Compute PV = Rs. 29,72,872

Step 3: Out of Rs. 1,64,49,402, Rs. 29,72,872 will be invested for estate building. The remaining amount of Rs. 1,34,76,530 will be invested to generate a regular income for retired life.

26. A couple wishes to invest Rs. 50,000 per annum for the purpose of an efficient retirement plan. They will continue investing this money for a period of 20 years in an investment which is expected to give an average return of 14% p.a. After 20 years they will retire and wish to use the money for the next 22 years without any plan to leave an estate. Inflation rate is assumed to be 5% throughout the phase. What is the value of that accumulated amount in terms of the present rupee value?

27. A couple wants to accumulate a retirement fund of Rs. 25,00,000 in current rupee terms, in 18 years. They expect inflation to be 4% per year during that period. If they set aside Rs. 1,25,000 at the end of each year which earns an interest of 9% p.a. on their investments, will they reach this goal?

(*Hint:* we have to calculate FV of Rs. 25, 00,000 at a rate of 4% ; then calculate FV of the Pmt of Rs. 1,25,000; and then see the difference)

28. A person requires a corpus of Rs. 50 lakh on retirement. He is aged 30. He will retire at age 55. If he saves Rs. 45,000 every year for 10 years, how much should he save every year for the remaining 15 years to have the required corpus on retirement? Assume he is able to get a return of 10% on his investments.

29. Sanjiv has been saving Rs. 5,000 at the end of every month in a diversified equity scheme of a mutual fund for the last 8 years and has been earning a compounded return of 12% per annum consisting entirely of capital appreciation. Will he have enough money to purchase a house worth Rs. 35,00,000 (after 5 years) if he continues to invest the same amount every month for the next 5 years and generates the same rate of return?

30. Mita aged 30 is interested in planning for retirement. She saves Rs. 15,000 per year, at the end of each year in a bank deposit earning an interest of 8.50% p.a. compounded annually until she retires at age 58. Her life expectancy is 80 years. What will be her corpus on the date of retirement?

31. In the same question, what is the fixed amount she can withdraw at the beginning of each year until age 80 in case she wishes to exhaust her corpus completely?

32. Mrs. Sunita is 40 years old and plans to retire at age 55. Her life expectancy is 75 years. She estimates that she will require Rs. 45,000 in the first month after retirement. Inflation rate is 5% p.a. and the rate of return is 11% p.a. What will be the savings per year required in order to meet this?

33. Mr. Ramneet has just retired from service with a lump sum of Rs. 27,95,000 as retirement benefits. Currently he is 59 and life expectancy for him is 77 years. He intends to take a world tour after four years, which would entail an amount of Rs. 4 lakh at current prices. He also wishes to buy a new car for Rs. 3,50,000 immediately. Calculate what amount will be available to him for post-retirement living expenses at the end of every month, considering inflation is at 4.50% and rate of return is 9.5%

Solution: Out of Rs. 27,95,000 he has to spend Rs. 3,50,000 to buy a car and he also has to invest some money separately for the goal of taking a world tour after 4 years. The present cost of this is Rs. 4,00,000 but after 4 years it will be Rs. 4,77,007. To get Rs. 4,77,007 after 4 years, he has to invest Rs. 3,31,794 at a rate of 9.5% to get that amount.

Amount available for retirement corpus is 2795000

–350000

–331794

= Rs. 21,13,206

Rs. 21,13,206 will be invested for the purpose of retirement.

–2113206 = PV

4.78%/12 = i

18 × 12 = n

Compute Pmt = Rs. 14,606.70

34. Mr. Madaan is a self-employed professional and saves Rs. 12,000 per month for the purpose of retirement. He is 46 years old and will retire from his work at age 65. He wishes to invest his money in the best available avenues of investment which can generate him 15% return per annum. He assumes his life expectancy to be 85 years. How much can he withdraw every month, at the beginning of the month after retirement?

35. Mr. Verma is working as a GM in a public sector enterprise. He is 40 years old and will retire at age 60 and has approached a financial planner to make a plan for estate building. He is not worried about saving for his retirement as his employer will provide him and his spouse sufficient pension till they are alive. He wishes to leave an estate of Rs. 10 crore for his next generation when he dies, at age 80. How much does he need to invest every quarter till he is working if the rate of return is 10% p.a. compounded quarterly?

36. Mr. Rastogi is a financial consultant. He does not get a fixed income every month. After meeting his living expenses, he keeps the surplus money in a savings account each month and after every six months he invests that money in various avenues of investment. He invests Rs. 70,000 every 6 months in various funds where he gets an average return of 14.25% p.a. He has been saving for the

last 5 years and he is planning to save the same amount for the next 15 years. How much will he accumulate 15 years hence?

37. Mr. Sabharwal has been investing in a pension plan for the purpose of planning for retirement. He is 38 years old and invests Rs. 45,000 in this fund every year at the end of the year. This plan will generate a return of 8% p.a. during the accumulation phase as well as the distribution phase. He will contribute till he is 50 years of age and vesting age is 58 years. He wishes to withdraw monthly pension at the beginning of every month for the next 20 years after vesting age. How much he can withdraw every month?

38. Mr. Mehta, 38 years old, is also planning for his retirement and saving Rs. 45,000 every year into a fund which pays him 12.5% return every year. He saves money every year up to age 50 and will start withdrawing at age 58. How much can he withdraw at the beginning of every month for the next 20 years if the return on investment is 8% during the distribution phase?

39. Mr. Suresh has started putting Rs. 35,000 every year into a ULIP plan of an insurance company. Assuming that on an average after meeting expenses of the insurance company and providing for mortality, a net amount of Rs. 32,000 is getting invested into the fund which will form the retirement corpus. He is 30 years old and will continue to put money in this plan till he retires at age 60. He has given a growth fund (pure equity) option which will give a return of 14.50% in the long run. How much accumulated amount will he get at age 60?

40. If he wishes to invest this amount in a safe fund which earns a return of 8% per annum, how much can he withdraw every month at the beginning of each month for the next 25 years?

ANSWERS TO PRACTICE QUESTIONS ON RETIREMENT PLANNING — 2

BOX

Question Number	*Answers*
21	Rs. 2,50,905
22	Rs. 2,716
23	Rs. 14,91,655 and Rs. 91,654
24	Rs. 30,120.29
25	Rs. 10,11,355
26	Rs. 17,15,316.75
27	Yes, Rs. 98,126 will be more than required (Rs. 5162667 – Rs. 5064541)

28	Rs. 63,078
29	No, he will get only Rs. 18,61,045 with this saving. He can buy a house if he takes a loan for the balance amount.
30	Rs. 15,56,156
31	Rs. 1,46,205
32	Rs. 1,87,790
33	Rs. 14,606.70
34	Rs. 1,99,575
35	Rs. 59,845
36	Rs. 1,44,32,651
37	Rs. 13,133.55
38	Rs. 23,868
39	Rs. 1,26,01,039
40	Rs. 96,612.76

PRACTICE QUESTIONS ON RETIREMENT PLANNING — 3

41. Abhishek is an affluent broker and wishes to retire at age 45. He wishes to maintain his present standard of living. He spends Rs. 5,00,000 p.a. His life expectancy is assumed to be 85 years. Average inflation rate is 4% and return on investment is 12% p.a. His present age is 30 years. If he is able to invest Rs. 5,00,000 per year, at what age can he retire? Can he retire at age 45? What is the accumulated amount he will get at age 45?

42. Suresh is 25 years old and currently spends Rs. 2,28,000 p.a. If the rate of inflation is 5% per annum and he wishes to maintain the same standard of living even after retirement, what amount would be required by him to spend during the first year of his exit from service at age 60?

43. What is the amount required after retirement if he needs only 67% of his last spending?

44. Sunder is going to retire at age 60. Life expectancy is 75. He requires a monthly income of Rs. 15,000 after retirement. If his investments are giving a return of 7% per annum, what will be the accumulated assets he needs on retirement?

45. Richa aged 20 years will retire at age 45. Life expectancy is 70 years. If the inflation rate is 4% and rate of return on investment is 6%, calculate the amount of savings required per year if she needs Rs. 55,000 in the first month after retirement?

46. Ram, aged 35 years, saves Rs. 30,000 per year and puts it in a bank fixed deposit at a rate of 9% per annum till age 60. Life expectancy is assumed to be 70 years. What will be the corpus at age 60 and how much can he withdraw every year at the beginning of each year till age 70?

47. In the above case, if he wishes to leave an estate of Rs. 15,00,000 for his family at age 70, how much can he spend per year if he withdraws at the beginning of every year?

48. Mrs. Reshma is 25 years old and will retire at age 50. Life expectancy is assumed to be 70 years. She will require Rs. 85,000 in the first month after retirement. Inflation rate is 3% per annum and return is 8% p.a. What is the corpus required to meet her expenses?

49. In the above question, what amount does she has to save per month to meet this goal of providing the required amount per month after retirement?

50. Mr. Prabhat, aged 35 years, will retire at age 60. Life expectancy is 80 years. Inflation adjusted requirement in the first month after retirement is Rs. 25,000. Inflation rate is 5% and rate of return is 8%. What will be the required corpus at the time of retirement? Will the corpus be enough to fund his retirement if he is able to save Rs. 48,000 per annum?

ANSWERS TO PRACTICE QUESTIONS ON RETIREMENT PLANNING — 3

BOX

Question Number	*Answers*
41	Yes, he can retire at age 45. He requires Rs. 9,00,472 at the beginning of every year for 40 years (46–85). His investments will grow to Rs. 1, 86,39,857. The interest of even 10% on this will be more than the required amount. In this case he will also leave an estate.
42	Rs. 12,57,651.50
43	Rs. 8,42,626.50
44	Rs. 16,68,839
45	Rs. 2,38,617 (The required amount at age 45 is Rs. 1,30,91,632.)
46	Rs. 25,41,027 3,63,250.50
47	Rs. 2,72,672.43
48	Rs. 1,30,95,574 (real rate is 4.85%)

49	Rs. 13,769.93 or Rs. 13,770 per month
50	Rs. 45,77,362, No real rate is 2.857% p.a. He will be able to accumulate only Rs. 35,09,085

PRACTICE QUESTIONS ON RETIREMENT PLANNING — 4

51. Siddhartha is working in a multinational company as senior manager. He is 35 years old and has two children. His son is 6 years old and daughter 2 years old. His wife is a housewife. He saves enough every month to meet the various goals of his life such as children's education, marriage, buying a house, etc. He is concerned about his retirement planning and has recently opened a PPF account in which he will put Rs. 70,000 every year at the beginning of each year. His basic salary is Rs. 30,000 and he contributes 10% of this towards EPF every month. His employer also contributes a matching amount. His basic salary increases by 10% every year. If he retires at age 55, how much accumulated amount will he get on retirement from both the sources if he continues putting Rs. 70,000 in PPF every year up to age 50 and then invests the accumulated amount at a return of 10% per annum? Return on EPF is assumed to be 9% p.a. throughout the phase. Return on PPF will be 8% p.a. throughout the period.

Solution: Let us first calculate the amount he will get from the PPF investment.

–70,000 = Pmt
Bgn
15 = n
8 = i
Compute FV = Rs. 20,52,700

He will get this amount at age 50 when he closes the PPF account. This amount is invested at a return of 10% p.a.

–20, 52,700 = PV
10 = i
5 = n
Compute FV = Rs. 33,05,893 (1)

Now we have to find out how much will accumulate in the EPF account when the salary increases by 10% every year and average return on EPF is 9% p.a.

For EPF, we have converted it into annual savings and with the help of the formula for growing annuity we have to compute the amount of accumulated savings.

BOX

	First installment Rs.	*Interest factor*	*No. of years*	*Future value Rs.*
1	72000.00	1.09	19	370199.61
2	79200.00	1.09	18	373,595.94
3	87120.00	1.09	17	377023.42
4	95832.00	1.09	16	380,482.35
5	105415.20	1.09	15	383973.02
6	115956.72	1.09	14	387,495.71
7	127552.39	1.09	13	391050.71
8	140307.63	1.09	12	394,638.33
9	154338.39	1.09	11	398258.87
10	169772.23	1.09	10	401,912.62
11	186749.46	1.09	9	405599.89
12	205424.40	1.09	8	409,320.99
13	225966.84	1.09	7	413076.23
14	248563.53	1.09	6	416,865.92
15	273419.88	1.09	5	420690.38
16	300761.87	1.09	4	424,549.92
17	330838.06	1.09	3	428444.88
18	363921.86	1.09	2	432,375.56
19	400314.05	1.09	1	436342.31
20	440345.45	1.09	0	440,345.45
				8086242.11 (2)

Total accumulated savings are (1) + (2) = Rs. 33,05,893 + Rs. 80,86,242 = Rs. 1,13, 92,135

The accumulated amount of EPF can also be calculated with the help of the growing annuity formula which has been explained earlier in the book.

52. Siddhartha is 39 years old and is working in a multinational company with good prospects. He gets a salary of Rs. 52,000 per month. He has two sons aged 10 and 7. His wife is a housewife who looks after the children and his elderly parents. Their monthly expenses are Rs. 35,000 per month. He has recently bought a house with all his savings. He has no savings left except a savings account balance of Rs. 1,00,000 which is kept as an emergency fund. His goals are as follows:

- To save monthly for elder son's higher education; the sum required is Rs. 10, 00,000 in today's terms and the money is required after 10 years

- To save monthly for younger son's higher education; money required is Rs. 22, 00,000 after 13 years
- To provide for his own retirement after 19 years

How much he can save every month for the goal of his own retirement planning after saving for the two goals for his children? Assume that the increase in salary every year will go towards increases in expenses and standard of living. Inflation rate is assumed to be 6% p.a. throughout. Investment rate is 12% p.a. How much will be the accumulated amount at the time of retirement?

53. Mr. Murugan is 28 years old and earns an income of Rs. 8,000 per month. His wife is a housewife. Both of them are less educated but want their 2-year old daughter to have the best education. Their expenses per month are Rs. 4,500. The cost of education in today's terms is Rs. 6,00,000. The money is required after 19 years. Calculate the amount required and will the amount of saving per month be adequate to provide for the higher education? Inflation is assumed to be 5% throughout and interest rate on investments is 11% p.a. compounded monthly.

54. Mr. Ashok Arora is 49 years old and is working as a gazetted officer in a state government. His savings every year go towards providing education to both his children, son (21 years old) and daughter (17 years). He has no savings at present and the amount of EPF is also withdrawn every year to pay the fees for his son. He will retire after 11 years and will get Rs. 18,00,000 as PF and gratuity. He will also get a good pension. His only worry is providing for his daughter's marriage after 7 years, the expected cost of which will be Rs. 10,00,000. How much does he have to save per month for this goal if the rate of return is 14% p.a.?

55. Mr. Prakash is 40 years old and has provided for all other goals except retirement planning. He spends Rs. 25,000 per month now and is retiring after 20 years. Inflation rate is 6% p.a. He has plans to construct a house on a plot of land bought by him in the name of his wife. That house will generate an income of Rs. 20,000 per month. Calculate the amount he should save every month if he requires only 75% of his last spend before retirement after considering the income from his house? Average return on investments is 12.75% p.a. His life expectancy is 80 years.

56. Mr. Srivastava is retiring next year from a private sector organization. He was working as a manager before retirement. He will not get any pension and will get Rs. 35, 00,000 as PF and gratuity. He needs Rs. 5,00,000 out of this money for his daughter's marriage. How much can he withdraw every month for the next 15 years if he invests this money at a rate of return of 12% p.a.?

57. Sahaniya is 40 years old and wishes to retire at age 50. She is working as a senior manager in an oil company. There is no provision of pension in that organization. Her present expenses are Rs. 18,000 p.m. She is staying in her

own flat. She wishes to maintain the same standard of living even after retirement. Her present income is Rs. 28,000 per month. She will get Rs. 20,00,000 on retirement at age 50. If she has to maintain the same standard of living and her life expectancy is assumed to be 75 years, what amount per month is required after retirement and will she be able to retire at age 50? Inflation rate is assumed to be 5.5% p.a. and investment return is 11% p.a.

58. In the same question what is the amount of savings she should make if she wishes to retire at age 50?

59. Mr. Sohal aged 60 spends Rs. 25,000 every month and wishes to maintain the same standard of living after retirement. He is retiring next month and he will get the following amounts:

Retirement benefits	=	Rs. 20, 00,000
PPF maturity proceeds	=	Rs. 15,00,000
Maturity of RBI bonds	=	Rs. 8,00,516
Total Amount	=	Rs. 43,00,516

If he invests this money at a rate of 10% p.a. and withdraws the amount he requires at the beginning of every month, for how many years can he do this if he wishes to maintain the same standard of living. Inflation rate is 5% p.a.

60. Sudhakar is 28 years old and is married with twins aged 2 years. He saves systematically for the education of his sons and their marriage. He has recently bought a house partly with a loan amount and partly with his own money. He has approached a financial planner for the goal of retirement planning. He spends Rs. 20,000 at present and he wishes to increase his standard of living by 2% above inflation every year up to retirement. The average rate of inflation is 4% p.a. He wishes to retire at age 55. He would like to maintain the same standard of living after retirement also. His life expectancy is assumed to be 80 years. How much does he have to save every month at the beginning of the month, to meet his goal of retirement funding if the average return on investment is 15% p.a.?

61. In this case, if he wishes to leave an estate of Rs. 2 crore for the next generation, how much additional amount does he have to save every month for this goal?

62. A person is 42 years old and is not keeping good health. He wishes to leave his job at age 50 but his employer has a provision to start paying pension only at age 60. Therefore, he has approached you to make a plan in such a way that from age 50–60 when there will not be any pension available to him he has the provision to spend Rs. 20,000 per month. He has to invest money every month from now on to make available Rs. 20,000 per month between the age of 50 and 60. How much should he save every month if return on investments is 12.5% p.a. convertible monthly?

63. Mr. Chakraborty has been very optimistic about the growth of his business and enjoys life lavishly. At the same time he is also planning to start saving money for his post-retirement phase which will start at age 65. He spends Rs. 45,000 per month now and increase in standard of living is 2% above inflation every year. He is 40 years old at present. Inflation rate is 5% p.a. and his life expectancy is assumed to be 80 years. How much does he have to save every month from now on if the rate of return on investments is assumed to be 13.25% (average).

Question Numbers 64–69 are interlinked

64. Mr. Verma is 34 years old and is self-employed. He earns a monthly income of Rs. 45,000. He is unmarried and has no plans to marry. He stays with his aged parents in his own house. His parents are dependent on him. His present expenses are Rs. 25,000 per month. He assumes that after approximately 15 years when his parents are not alive, he will require only 50% of the amount. He has bought a mediclaim policy of an adequate amount for both his parents. His life expectancy is assumed to be 80 years. If average inflation rate is assumed to be 5% p.a. throughout and rate of return on investments is 12% p.a. how much he will require at age 60 when he retires from his work?

65. In this question what is the amount of accumulated savings required at age 60 if he wishes to maintain the same standard of living after retirement and his life expectancy is assumed to be 80 years?

(Real rate is 6.67% p.a.)

66. In the same question, how much does he have to save every month at the beginning of every month, to accumulate the required amount for his retirement goal?

67. What will be the required amount of savings at the end of every month if he wishes to spend Rs. 8,00,000 out of accumulated savings on a world tour at age 60?

68. What would be the required amount of accumulated savings at age 60 if he goes for a world tour at age 60 and his life expectancy is 85 years instead of 80 years? He spends Rs. 8.00.000 on the tour.

69. How much does he have to save every month, at the end of the month, to accumulate the required sum in the above question? The return on investments is 12% p.a. convertible monthly.

70. Mr. Pankaj has invested Rs. 8,00,000 in RBI (8% taxable) bonds, recently. He has also invested Rs. 2,25,000 in NSC. He is retiring after 6 years. He wishes to use this money as part of his nest egg for retirement. How much will he get from both these investments when he retires? How much can he withdraw every year for 15 years if this accumulated amount is invested at a return of 10% p.a.?

ANSWERS TO PRACTICE QUESTIONS ON RETIREMENT PLANNING — 4

BOX

Question Number	*Answers*
51	Rs. 1,13,92,135
52	Rs. 3304, 28,63,441
53	Rs. 15, 16,170, 1,983.10 p.m. to be saved for daughter's education. Savings will be adequate for daughter's education.
54	Rs. 7,073.34 per month
55	Rs. 5,234 per month (Real rate is 6.3679% p.a.)
56	Rs. 36,005 per month
57	Rs. 31,159 per month. No, she should have Rs. 52,42,888 at retirement. She will get Rs. 20 lakh from her employer. In 10 years' time she cannot accumulate Rs. 32,42,888
58	Out of the total required amount of Rs. 52,42,888 she will get Rs. 20 lakh from the employer. She will have to save Rs. 14,944.31 per month to retire at age 50.
59	Rs. 4300516 will be invested and the rate used will be 4.76%/12 p.m. Ans is 289.68 months or 24.14 years
60	Rs. 2,402 per month. Real rate is taken as 10.57%
61	Rs. 138.14 p.m.
62	Rs. 8,351.28 p.m.
63	Rs. 11,564.70
64	Rs. 45,742.49
65	Rs. 60,87,323 should be the nest egg at age 60. Real rate is 6.67% amount is withdrawn at the beginning of every month.
66	Rs. 2,829.85
67	Rs. 3,233.77
68	Rs. 75,06,351. He needs Rs. 67,06,351 as accumulated sum to sustain himself for 25 years after retirement and he wishes to spend Rs. 8,00,000 on world tour (6706351 + 800000 = 7506351)
69	Rs. 3,524.41
70	Rs. 16,41,058; 2,15,756.09

PRACTICE QUESTIONS ON RETIREMENT PLANNING — 5

71. Mr. Sinha, aged 45, wishes to retire at age 55. After 10 years when he retires, he will require Rs. 55,000 per month (inflation adjusted) for the next 25 years and after his death at age 80 (assumption), his wife will survive for another 10 years and she will require Rs. 25,000 per month. If interest rate is 11% p.a. and inflation rate is 5% p.a. what amount does he have to save per month to meet this goal? He has no plans to leave an estate. The amount will be withdrawn at the beginning of every month.

Solution: In this question, let us first understand the question with the help of a line

	55000 p.m.		25000 p.m.
0	10	35	45

In the first 10 years, that is year 45 to 55, he will accumulate money. In the next 25 years, he will withdraw Rs. 55,000 per month and in the next 10 years his wife will require Rs. 25,000 per month. Since the amount is inflation adjusted we will not use inflation rate in our calculations. We have to start the calculation from the back.

25000 = Pmt
Bgn
10 × 12 = *n*
11/12 = *i*
Compute PV = –Rs. 18,31,518.30
1831518.30 = FV
25 = *n*
11 = *i*
Compute PV = –Rs. 1,34,814.55 (1)
55000 = Pmt
Bgn
25 × 12 = *n*
11/12 = *i*
Compute PV = –Rs. 56,63,037.05 (2)

(1) + (2) is the accumulated amount required at age 55 to withdraw the required amounts.

5797851.60 = FV
10 × 12 = *n*
11/12 = *i*
Compute Pmt = Rs. 26,718.44

72. A 33-year old employee plans to save 12% of his salary at the end of every year until his retirement at the age of 58 years. He is currently getting an annual salary of Rs. 4,80,000 which is expected to increase by 8% every year. If his savings earn 7.5% p.a. interest, how much accumulated money will he have on retirement?

Important things to understand about this numerical in Excel:

In Pmt cell press = 0.12 × salary cell

Interest factor will be common for all the years

In FV cell press = Pmt cell × Interest factor cell shift 6 No. of years cell enter

The first installment which is invested at the end of first year will remain invested for 24 years, subsequent installments for 23 years, and so on. Had he invested at the beginning of the year, the first installment would be invested for 25 years.

Growing annuity

Salary (Rs.)	*Pmt (Rs.)*	*Interest factor*	*No. of years*	*FV (Rs.)*
480000	57600	1.075	24	326757.55
518400	62208	1.075	23	328277.35
559872	67184.64	1.075	22	329804.22
604661.8	72559.41	1.075	21	331338.19
653034.7	78364.16	1.075	20	332879.30
705277.5	84633.3	1.075	19	334427.58
761699.7	91403.96	1.075	18	335983.05
822635.6	98716.28	1.075	17	337545.77
888446.5	106613.6	1.075	16	339115.75
959522.2	115142.7	1.075	15	340693.03
1036284	124354.1	1.075	14	342277.65
1119187	134302.4	1.075	13	343869.64
1208722	145046.6	1.075	12	345469.03
1305419	156650.3	1.075	11	347075.86
1409853	169182.4	1.075	10	348690.17
1522641	182716.9	1.075	9	350311.98
1644452	197334.3	1.075	8	351941.34
1776009	213121	1.075	7	353578.28
1918089	230170.7	1.075	6	355222.83
2071537	248584.4	1.075	5	356875.03

(Rs.)	*(Rs.)*			*(Rs.)*
2237259	268471.1	1.075	4	358534.91
2416240	289948.8	1.075	3	360202.52
2609539	313144.7	1.075	2	361877.88
2818303	338196.3	1.075	1	363561.03
3043767	365252	1.075	0	365252.01
				8641561.92

Question Numbers 73–76 are interlinked

73. Mr. Pushpangadan saves Rs. 12,500 per month at the end of every month for 30 years. He is 30 years old. Rate of return on investments is 12% p.a. convertible monthly. He will retire at age 60. We assume inflation to be 5% throughout the phase. How much will his savings grow to when he is 60?

74. How much can he spend every year after retirement if his life expectancy is assumed to be 75 years and we ignore the inflation rate? He withdraws the amount at the beginning of every year.

75. If he spends Rs. 50 lakh per annum, how much estate will he leave behind?

76. How much can he spend every year after retirement if we take the impact of inflation and life expectancy is assumed to be 75 years? The amount is withdrawn at the beginning of every year.

77. Mr. Raman has started saving Rs. 15,000 per month. He is 35 years old and will retire at age 60. Rate of return is 12% p.a. How much will he accumulate and how much can he spend per annum at the beginning of every year for the next 15 years?

78. If he spends only 35 lakh per annum and he does not want to leave an estate, how early can he retire?

Solution: If he retires at age 60, he will accumulate Rs. 2,81,82,699 and he can spend Rs. 36,94,556 p.a. If he spends only Rs. 35,00,000 out of the eligible amount of Rs. 36,94,556 we have to find out how early he can retire.

The important thing to remember here is that if he retires early, his saving period will reduce to that extent and his consumption period will increase by that extent. The amount required at retirement will also keep changing when we try with different years. The amount required will keep increasing with the rate of inflation and if he retires early, the amount required will also change. This sum will be done with a hit and trial method. Amount accumulated (FV) should match with the amount required (PV).

Let us try with retiring 1 year early

Savings and accumulated amount (FV)	required amount (PV)
15000 = Pmt	3500000 = Pmt
24 × 12 = *n*	Bgn
12/12 = *I*	16 = *n*
Compute FV = Rs. 2,48,41,888.57	12 = *i*
Compute PV = Rs. 2,73,38,025.71	

There is a difference of Rs. 24,96,137 and the required amount is more than the accumulated amount; therefore he will have to work for a longer period.

Let us try with retiring 6 months early

15000 = Pmt	3500000 = Pmt
24.5 × 12 = *n*	Bgn
12/12 = *I*	15.5 = *n*
Compute FV = Rs. 2,64,62,445.53	12 = *i*
Compute PV = Rs. 2,70,27,363.15	

Difference between the required amount and accumulated amount is Rs. 5,64,917.62 and the accumulated amount is less than the required amount. So he cannot retire early by 6 months. We will have to try with retiring 3 months early.

Let us try with retiring 3 months early

15000 = Pmt	3500000 = Pmt
24.75 × 12 = *n*	Bgn
	15.25 = *n*
12/12 = *I*	12 = *i*

Compute FV = Rs. 2,73,09,735.59 Compute PV = Rs. 2,68,65,304.54

He can retire early by 3 months as the accumulated amount is more than the required amount.

Question Numbers 79–82 are inter-related

79. Mr. Malhotra is 40 years old and spends Rs. 2,50,000 p.a. He wishes to maintain the same standard of living as he maintains now. Retirement age is 60 but he wishes to retire at age 50. He is able to save Rs. 20,000 p.m. from now on towards retirement as he was saving until now for other financial goals. Rate of return on investments is 12% p.a. and inflation rate is 5% p.a. How much will he be able to accumulate at age 60 and what will be the annual requirement for household expenses?

80. Will he be able to meet his goal of retirement planning if his life expectancy is assumed to be 80 years and he retires at age 60?

81. How much can he spend per annum if he withdraws the amount at the beginning of every year and his life expectancy is assumed to be 80 years?

82. If he wishes to spend Rs. 6,63,324 in the first year of retirement, can he retire at age 50? Assume his life expectancy is 80 years.

83. How early he can retire from his actual retirement age of 60 years if his life expectancy is assumed to be 80 years and he wishes to maintain the same standard of living even after retirement? He does not wish to leave an estate for his next generation.

(*Hint:* Hit and trial method)

84. Mrs. Sunita is 40 years old and working as a teacher in a government school. Her husband died a year ago. She has just received Rs. 20,00,000 from the insurance company and Rs. 12,00,000 as PF and gratuity from his employer. Out of the money received she spent Rs. 10,00,000 in paying off the housing loan. The balance has been invested in RBI bonds and bank FD'S. She has two children; a son aged 14 and daughter aged 10. She believes that the accumulated amount will be used towards her children's education and marriage. She has to plan for her own retirement. Present household expenses are Rs. 18,000 p.m. She will require only 50% of the last spend before retirement. She will get a pension of Rs. 5,000 per month (Inflation adjusted). She has approached you to make a retirement plan for the remaining amount. How much should she save every month till her retirement at age 58 if her life expectancy is 75 years? Rate of return on investments is 11% and inflation is 4.5% p.a.

85. Mr. Mehra is 45 years old and wishes to retire at age 50. The employer will provide him a pension from age 60 onwards. He has to plan for regular income of Rs. 1,20,000 every year at the beginning of each year from age 50 to 60. He feels that the pension will be sufficient to take care of his regular expenses. He has taken out a mediclaim policy to take care of his medical needs. He has a lump sum amount to invest for this goal. How much should he invest now so that he can withdraw the required amount? The first payment of Rs. 1,20,000 every year will start at the end of the 50th year. The rate of return on investments is 11.25% p.a.

ANSWERS TO PRACTICE QUESTIONS ON RETIREMENT PLANNING — 5

BOX

Question Number	*Answers*
71	Rs. 26,718.44
72	Rs. 86,41,562
73	Rs. 4,36,87,051
74	Rs. 57,27,069. Rate has been taken as 12%

75	Rs. 3,03,57,545. *Hint:* Required nest egg to spend Rs. 50 lakh p.a. for 15 years is Rs. 3,81,40,841. Existing investments are Rs. 4,36,87,051 Surplus of Rs. 55.46,210 will become Rs. 3,03,57,545 in 15 years
76	Rate will be real rate = 6.67%44,03,404 p.a. can be withdrawn
77	Rs. 2,81,82,699; 36,94,556.56
78	He can retire early by 3 months
79	Rs. 1,97,85,107; 6,63,324
80	Yes, he requires only Rs. 76,92,152.80 and he has accumulated Rs. 1,97,85,107
81	Rs. 17,06,146.10
82	No, he will save only for 10 years and the accumulated amount will be Rs. 46,00,773.79 and he will be requiring money for the next 30 years after retirement and the amount of PV at age 50 is Rs. 90,79,331.84
83	He can retire early by 8 years. We tried with 5 years, the required amount at age 55 to meet expenses for next 25 years is Rs. 66,57,423 and the accumulated amount at age 55 is Rs. 99,91,604. Then we tried with 8 years and the required amount is Rs. 60,02,605 and accumulated amount is Rs. 63,81,231 Difference is narrow and the accumulated amount is more than the required amount. Point to note is that the amount required at age 55 is Rs. 5,19,732 and at age 52 is Rs. 4,48,964
84	Rs. 2,850.80
85	Rs. 4,56,563.15

PRACTICE QUESTIONS ON RETIREMENT PLANNING — 6

86. Ms. Bimla is 48 years old and spends Rs. 20,000 per month. She is working in a private sector organization and will not get pension income after retirement. She desires that when she retires at age 58, she should start contributing Rs. 15,000 every month towards charitable purposes. As she is single she has no responsibility except to provide for her own retirement and to save sufficiently for contributing towards charity. When she retires,she will get Rs. 40,00,000 from all sources. The amount towards charity should be continued in perpetuity. How much should she save every month if her life expectancy is assumed to be 75 years, inflation rate is 5% p.a. and return on investments is 12% p.a. She wishes to maintain the same standard of living after retirement.

87. Mr. Sudhaker is retiring next month at age 60. He has various investments in equity and debt instruments. He has approached you to do a proper asset allocation and make a plan for him which is a retirement-cum-estate building plan. He wishes that when he dies at age 80, he should leave as an estate for his grandson a sufficient amount so that his grandson gets Rs. 5,00,000 p.a. at the beginning of every year for the next 20 years. The first installment of Rs. 5,00,000 will start immediately after Mr. Sudhaker's death. He requires Rs. 15,000 every month at the beginning of the month after his retirement (fixed amount) till he survives. How much does he need for both the goals if the average rate of return on his portfolio is assumed to be 10.75% p.a.?

88. Mr. Radhey Shyam is 50 years old and has provided for all other goals except retirement planning. He works in a private sector concern and will not get any pension income when he retires at age 60. He wishes to withdraw Rs. 20,000 every month at the beginning of each month for the next 20 years after retirement. How much does he have to invest now for the goal of funding his retirement if rate of return on investment is 11.50% p.a.?

89. In the above question if he wishes to invest every month in a SIP, how much does he have to invest every month, at the end of every month, for funding his retirement?

90. In this question, if he wishes to leave an estate of Rs. 2 crore at age 80 and the average rate of return on investment is 10.80% p.a., what amount does he have to invest now for the goal of estate building?

91. Mr. Wadhwa is 54 years old and gets a salary of Rs. 50,000 per month and expenses are Rs. 20,000 p.m. He is working in a senior position in a public sector oil company. He will retire at age 58 get a pension from his employer that will take care of his regular needs after retirement. The PF and gratuity will serve as a cushion for future needs. He has two daughters; the elder is married and settled and the younger is also in a good job. He spent all his savings in providing a good education to both his children and for the marriage of his elder daughter. His only worry is the younger daughter's marriage in 3 years time. He has approached you to help him to provide an amount of Rs. 15,00,000 after 3 years for this goal. How much should he save every month, at the beginning of every month, to enable him to accumulate Rs. 15,00,000 for her marriage? Rate of return on investment is 14% p.a. and he has already accumulated Rs. 2,00,000 which will generate a return of 14% p.a.

92. Mr. Gupta is 40 years old and spends Rs. 2,20,000 p.a. He will retire at age 60 and wishes to maintain the same standard of living after retirement also. If he is able to save Rs. 12,000 p.m. and life expectancy is assumed to be 75 years, can he retire early by 10 years if the rate of return on investments is 12% p.a. and inflation rate is 4% p.a. throughout?

93. In this case, how early can Mr. Gupta retire if he does not wish to leave any estate? (*Hint:* Hit and trial method. The amount required should be

approximately equal to the amount saved. It will never be the exact amount. The amount of accumulated savings should be more than the amount required).

94. Mr. Sharma is retiring next year. He will not get any pension. His expected retirement benefits are Rs. 32,00,000. He also saves Rs. 18,000 p.m. through a SIP for one year and after one year he has plans to consolidate his holdings and put money into a scheme which provides him pension for the next 25 years. How much can he withdraw every month at the beginning of every month for the next 25 years if the rate of return on investments is 10% p.a.?

Question Numbers 95–100 are interlinked

95. Radha is 30 years old and spends Rs. 1,80,000 p.a. She wishes to increase her standard of living by 2% above inflation every year. Inflation rate is 5% throughout the period. She will retire at age 60 and after retirement the cost will increase with the rate of inflation and she will require only 65% of last spend before retirement. How much will she require at age 60 (after retirement) to meet her expenses?

96. If she is able to save Rs. 5,000 per month, how much will she accumulate at age 60 if the average return on investments is 13% p.a.?

97. If her life expectancy is assumed to be 85 years, how much can she spend every year at the beginning of every year if return on investments is 10% after retirement?

98. In the same question, if she wishes to leave an estate of Rs. 5 crore at age 85, how much additional amount does she have to save every month for this goal? Return on investment is 12%.

99. If she starts saving Rs. 6,500 every month instead of Rs. 5,000 at present, how much estate will she leave behind if she spends the amount of Rs. 20,00,000 every year from age 60 to 85 at the end of every year till she is alive, i.e. up to 85 years? Return on investment is 12% p.a. throughout the phase.

100. Continuing with the facts in the previous question, If she wishes to leave an estate of only Rs. 10 crore, how much additional expenses per year (at the end of every year) she can incur?

ANSWERS TO PRACTICE QUESTIONS ON RETIREMENT PLANNING — 6

BOX

Question Number	*Answers*
86	Rs. 6,675.61. *Hint:* She requires Rs. 32,940.18 per month after retirement for next 17 years. Real rate is 6.67% and the amount required is Rs. 40,35,649.71.

	Out of this Rs. 40 lakh will be available. For annuity in perpetuity, the amount required at age 58 is Rs. 15,000 × 12/.12 = Rs. 15,00,000. Total amount required to be saved at age 58 is Rs. 15,35,649.71.
87	Rs. 20,72,398.82 (Rs. 14,90,735.16 for retirement and Rs. 5,81,663.66 for estate building.)
88	Rs. 6,37,516.29
89	Rs. 8,475.21
90	Rs. 9,22,225.62
91	Rs. 27,096.24 Rs. 2,00,000 will become Rs. 2,96,308.80 in 3 years time. For the remaining required amount he has to save per month.
92	No, he cannot retire at age 50. He requires Rs. 38,44,904.59 at age 50 to meet his regular expenses for 25 years and he is able to accumulate only Rs. 27,60,464.27 The amount of expense required in the first year after retirement is Rs. 3,25,653.74. Real rate is 7.69%.
93	He can leave at age 53. At that age, the amount of accumulated savings required is Rs. 41,24,668 and amount accumulated is Rs. 44,66,508.65. We can also try with 53 and few months to reduce the gap further between amount required and amount accumulated.
94	Rs. 30,876.42
95	Rs. 8,90,634
96	Rs. 2,18,66,349
97	Rs. 21,89,976
98	Rs. 841.54 per month is the additional amount required to be invested by her.
99	Rs. 11,95,27,266. Accumulated amount is Rs. 2,27,17,267 and the required amount to meet expenses after retirement is Rs. 1,56,86,278. The surplus of Rs. 70,30,989 will become Rs. 11.95 crore in 25 years.
100	She can incur Rs. 1,46,453.86 p.a. additional expenses other than Rs. 20 lakh.

CHAPTER

8

Mutual Funds

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- ❑ *What is a mutual fund?*
- ❑ *Benefits of investing in MFs*
- ❑ *Structure of mutual funds*
- ❑ *History of mutual funds*
- ❑ *Terminology associated with MFs*
- ❑ *The mutual fund family*
- ❑ *Types of mutual fund schemes*
- ❑ *How to invest in a mutual fund scheme?*
- ❑ *Mutual fund as a globally proven investment*
- ❑ *Rights of a mutual fund holder*
- ❑ *Precautions to be taken while investing in mutual funds*
- ❑ *Frequently asked questions about mutual funds*

8.1 DEFINITION

A mutual fund is a trust that pools the savings of a number of investors who share a common financial goal. The money thus collected is invested by the fund manager in different types of securities depending upon the objectives of the scheme. These could range from shares and debentures to money market instruments. The income earned through these investments and the capital appreciation realized by the scheme is shared by its unit holders in proportion to the number of units owned by them.

Thus, a mutual fund is the most suitable investment for the common man as it offers an opportunity to invest in a diversified, professionally managed portfolio at a relatively low cost. The small savings of all investors are put together to increase the buying power and hire a professional manager to invest and monitor the money. Anybody with a surplus of as little as a few thousand rupees can invest in mutual funds. Each scheme has a defined investment objective and strategy.

A mutual fund is simply a financial intermediary that allows a group of investors to pool their money together with a predetermined investment objective. The mutual fund will have a fund manager who is responsible for investing the pooled money in specific securities (usually stocks or bonds). When one invests in a mutual fund, he buys units of the mutual fund and becomes a unit holder of the fund. A mutual fund is a trust that brings together money from many people and invests it in stocks, bonds or other assets. The combined holdings of these assets are known as its portfolio. Each investor in the fund owns units which represent a part of these holdings.

The profits or losses are shared by the investors in proportion to their investments. From time to time the mutual funds normally introduce a number of schemes with different investment objectives. A mutual fund is required to be registered with Securities and Exchange Board of India (SEBI) which regulates the securities markets, before it can collect funds from the public.

8.2 BENEFITS OF INVESTING IN MUTUAL FUNDS

Professional Management

Mutual funds provide the services of experienced and skilled professionals backed by a dedicated investment research team that analyses the performance and prospects of companies and selects suitable investments to achieve the objectives of the scheme. Fund management is a separate department where there is an expert fund manager at the top and a research team to help him take decisions regarding when and where to invest. The actual buying and selling of the various securities—both, equity and debt—is done by the dealers in the fund management department.

Diversification

Mutual funds invest in a number of companies across a broad cross-section of industries and sectors. This diversification reduces the risk because all the stocks will not decline at the same time and in the same proportion; some may do well at the same time that others are not. You achieve this diversification through a mutual fund with far less money than you can do on your own.

Convenient Management

Investment in a mutual fund reduces paperwork and helps you to avoid many problems such as bad deliveries, delayed payments and follow up with brokers and companies. Mutual funds save time and make investing easy and convenient. You may not have the expertise or the time to manage your own portfolio.

Return Potential

Over a medium to long-term, mutual funds have the potential to provide a higher return as they invest in a diversified basket of selected securities. The experience of many mutual fund schemes indicate that if the fund manager is capable of managing the portfolio efficiently, then over a medium to long term the return will be considerably more than the level of inflation. You have to be cautious while investing in a mutual fund and study the previous return history and the sectors selected by the scheme.

Low Costs

Mutual funds are a relatively less expensive way to invest compared to directly investing in the capital markets because the benefits of economies of scale in brokerage, custodial and other fees translate into lower costs for investors.

Liquidity

In open-ended schemes the investor can get his money back promptly at net asset value related prices. In close-ended schemes the units can be sold on a stock exchange at the prevailing market price or the investor can avail of the facility of direct repurchase at NAV related prices by the mutual fund. In case a close-ended scheme is not listed at a stock exchange, mutual funds offer investors the exit option if they require money, but they have to pay an exit load. The rate of exit load depends on the date of withdrawal. The longer the investor stays with the fund the lesser is the exit load he will have to pay.

Transparency

Regular information is provided on the value of your investment in addition to disclosure on the specific investments made by your scheme, the proportion invested in each class of assets and the fund manager's investment strategy and outlook.

Flexibility

Through features such as regular investment plans (SIP), regular withdrawal plans (SWP) and dividend reinvestment plans, you can systematically invest or withdraw funds according to your needs and convenience. A young client will invest money systematically as his financial goals are far away and he has to invest in order to meet the various goals of his life. A retired person has

accumulated a lump sum and he may need to withdraw regularly in order to meet his monthly expenses. A younger client will therefore opt for systematic investment plans (SIP) or voluntary accumulation plans (VAP) and the older client will opt for a systematic withdrawal plan (SWP)

Affordability

Individually investors may lack sufficient funds to invest in high-grade stocks but because of its large corpus, a mutual fund allows even a small investor to benefit from its investment strategy. A person may have only Rs. 10,000 with which he wishes to buy some stocks and his favorite stock costs Rs. 2,000. He can afford to buy only 5 stocks and he will also have to pay STT and brokerage separately. If he knows that the portfolio composition of a particular mutual fund scheme consists of this stock, he can invest in that scheme and can buy that particular stock as well as a few other good stocks also. Some mutual funds have started SIP's for as low as Rs. 50 and Rs. 100 per month so that very small investors can also benefit through investment via the mutual fund route.

Choice of Schemes

Mutual funds offer a family of schemes to suit your varying needs over a lifetime and a variety of schemes are available with mutual funds. An investor with the help of a financial consultant/financial planner can invest in the scheme that suits him best depending on his risk appetite, time horizon and expected return, to achieve his financial goals. These types of schemes will be discussed in detail.

Well Regulated

All mutual funds are registered with SEBI and they function within the provisions of strict regulations designed to protect the interests of investors. The operations of mutual funds are regularly monitored by SEBI. To protect the interest of the investors, SEBI formulates policies and regulations for the mutual funds. It notified regulations in 1993 (fully revised in 1996) and issues guidelines from time to time. MFs promoted by public or by private sector entities as well as those that are promoted by foreign institutions are governed by these regulations.

SEBI approved Asset Management Company (AMC) manages the funds by making investments in various types of securities. A custodian registered with SEBI holds the securities of various schemes of the fund in its custody. The general power of superintendence and direction over the AMC is vested with the trustees.

All mutual funds are required to be registered with SEBI before they launch any scheme.

8.3 STRUCTURE OF MUTUAL FUNDS

A mutual fund is set up in the form of a trust. The three-tier structure of mutual funds is as follows:

- Sponsor
- Trustee company/Board of trustees
- Asset management company (AMC)

The trust is established by a sponsor or more than one sponsor who is like the promoter of a company. The sponsor establishes the mutual fund and registers it with SEBI. He also appoints the trustees, the custodian and the asset management company in accordance with SEBI regulations. The sponsor has to contribute at least 40% of the net worth of the AMC.

The trustees of the mutual fund hold its property for the benefit of the unit holders. They are the first level regulators of the mutual fund and are governed by the provisions of Indian Trust Act, 1908.

The asset management company (AMC) approved by SEBI manages the funds by making investments in various types of securities. The trustees, on the advice of sponsors usually appoint the AMC. Therefore, the AMC is either appointed by the sponsors or by the trustees on the advice of the sponsors. The AMC is a private limited company in which sponsors and their joint venture partners are the shareholders. The minimum net worth of an AMC has to be Rs. 10 crore at all times. The trustees sign the investment management agreement with the AMC, which spells out the functions of the AMC.

Types of AMC's

- AMC owned by financial institutions
- AMC owned by banks
- AMC owned by Indian private sector companies
- AMC owned by FII's
- AMC owned jointly by Indian and foreign sponsors

The custodian, who is registered with SEBI, holds the physical securities of the various schemes of the fund in its custody. The depositories hold the securities which are in electronic form (dematerialized).The trustees are vested with the general power of superintendence and direction over the AMC. They monitor the performance and compliance of SEBI regulations by the mutual fund.

SEBI regulations require that at least two-thirds of the directors of the trustee company or board of trustees must be independent, i.e. they should not be associated with the sponsors. Also, 50% of the directors of the AMC must be independent. All mutual funds are required to be registered with SEBI before they launch any scheme.

8.4 HISTORY OF MUTUAL FUNDS IN INDIA

The mutual fund industry started in India with the formation of the Unit Trust of India under the UTI Act, 1963. Over a period of 25 years this grew fairly successfully and gave investors a good return, and therefore in 1987–93, as the next logical step, public sector banks and financial institutions were allowed to float mutual funds. SBI was the first non-UTI fund set up in 1987. During 1993–1996, the mutual fund industry was opened to private sector players. The success of the public sector mutual funds emboldened the government to allow the private sector to foray into this area.

The private sector mutual funds also brought with it new innovations in products and marketing strategies.

In the year 1992, Securities and Exchange Board of India (SEBI) Act was passed. The objectives of SEBI are to protect the interests of investors in securities and to promote the development of the securities market and to regulate it.

As far as mutual funds are concerned, SEBI formulates policies and regulates the mutual funds to protect the interests of the investors. SEBI notified regulations for the mutual funds in 1993. Thereafter, mutual funds sponsored by private sector entities were allowed to enter the capital market. The regulations were fully revised in 1996 and have been amended thereafter from time to time. SEBI has also issued guidelines to the mutual funds from time to time to protect the interests of investors.

All mutual funds whether promoted by public sector or private sector entities including those promoted by foreign entities are governed by the same set of regulations. There is no distinction in regulatory requirements for these mutual funds and all are subject to monitoring and inspections by SEBI. The risks associated with the schemes launched by the mutual funds sponsored by these entities are of a similar type.

8.5 TERMINOLOGY ASSOCIATED WITH MUTUAL FUNDS

There is a lot of terminology associated with mutual funds that one needs to know before one can start investing in them. These concepts are an important part of mutual fund investments.

Open-end Funds

All mutual funds fall into one of two broad categories:

- open-end funds
- close-end funds

Most mutual fund schemes are open-ended. The reason that these funds are called "open-ended" is because there is no limit to the number of new units that

they can issue. These funds are open for sale and repurchase throughout the year except during the book closure period. New and existing unit holders may add as much money to the fund as and whenever they want; the fund will simply issue new units to them.

Open-end funds also redeem or buy back shares from unit holders. A person may redeem his holding any time from an open-ended fund. In order to determine the value of a unit in an open-end fund at any time, a number called the net asset value (described later) is used.

Close-end Funds

Close-end funds issue a fixed number of shares to the public during the new fund offer (NFO) after which units are either listed in a stock exchange or the mutual fund gives investors an exit options at frequent intervals. Unlike open-end funds, close-end funds are not obliged to issue new shares or redeem outstanding shares. The price of a share in a close-end fund is determined entirely by market demand so shares can either trade below their net asset value ("at a discount") or above it ("at a premium").

Since you must take into consideration not only the fund's net asset value but also the discount or premium at which the fund is trading, close-ended funds are considered to be more suitable for experienced investors. Most of the close-end funds are issued with an exit option to investors; therefore there is no need for the scheme to be listed on the stock exchange.

Net Asset Value (NAV)

The performance of a particular scheme of a mutual fund is denoted by the net asset value.

Mutual funds invest the money collected from the investors in the securities markets. Since the market value of securities changes every day, the NAV of a scheme also varies on a day to day basis. Open-end mutual funds price their shares in terms of a net asset value (NAV). This is calculated by adding the market value of all the fund's underlying securities, subtracting all of the fund's liabilities, and then dividing this by the number of outstanding units in the fund. The resulting NAV per share is the price at which shares in the fund are bought and sold (plus or minus any sales fees).

Open-ended schemes have to calculate the NAV of all the schemes daily and post it on the website of AMFI by 8.00 p.m. Close-ended funds have to calculate the NAV every Wednesday.

Entry Load and Exit Load

Every investment of a mutual fund whether in equity or debt instrument entails some cost to the asset management company (AMC), which is generally passed on to the investors. This cost is the load to be born by the investors. Entry load is charged to recover the expenses of the fund such as brokerage, marketing

expenses, documentation costs, etc. Load is charged on the NAV of the scheme. With entry load, the sales price becomes higher than the net asset value. Exit load reduces the repurchase price to below the NAV.

For example, if the NAV of the scheme is Rs. 12 and an entry load of 2% is charged, then to buy one unit of that scheme the investor will have to pay 12(1.02) = Rs. 12.24

If he wishes to buy 1000 units of that fund he will have to pay Rs. 12,240.

If a person is holding 1000 units of a mutual fund scheme where the NAV is Rs. 12 and exit load is 2%, he will get 12(0.98) = Rs. 11.76 per unit and for 1000 units he will get Rs. 11,760.

Dividends and Capital Gains Distributions

Mutual funds earn money on their investments through one of two ways — dividend income and capital appreciation. In other words, a mutual fund makes money on one of the fund's assets when that asset pays the mutual fund dividends or interest, or when the mutual fund sells the asset for more than what it initially paid (if it sells the asset for less than what it initially paid, then that is called a capital loss).

Investors can select either the dividend or growth option while investing in a mutual fund. Under the dividend option there are again two options— dividend payout or dividend reinvestment. Dividend is announced by the mutual fund as and when it feels there are distributable profits. It is not mandatory to declare dividends at regular intervals. Whenever dividend is announced by the AMC, it is paid to all unit holders who have opted for the dividend payout option. Those who have chosen the dividend reinvestment option are allotted additional units at the ex-dividend net asset value. Those unit holders who select a growth option are not given dividend but growth is shown in the form of capital appreciation, i.e. in the form of increase in the NAV.

In order to determine which unit holders qualify for distribution payments, mutual funds specify a day during each distribution period that is known as the record day. If you own units in a fund on or before the record day you qualify for a distribution. The day after the record day is known as the ex-dividend date. If you purchase shares on the ex-dividend date then the amount of the distribution is subtracted from the fund's net asset value (NAV) per share.

Dividend received by unit holders in a mutual fund scheme is exempt from tax, in their hand. In the case of equity schemes, mutual funds do not have to pay any dividend distribution tax to the government. In the case of debt schemes, although investors do not have to pay tax on the dividend income, the mutual funds have to pay a dividend distribution tax before paying dividend to unit holders. The tax rates keep changing. One should keep oneself updated about the changes in tax rates. Capital gain is also subject to capital gain tax. The tax rate will depend on the type of scheme (equity or debt) and the period of holding.

8.6 MUTUAL FUND FAMILY

A mutual fund family is a group of mutual fund schemes that are managed by the same company. It is usually easy to switch money between mutual fund schemes that are part of the same family if one wishes to do so.

8.7 TYPES OF MUTUAL FUND SCHEMES

- **By Structure**
  - Open-ended schemes
  - Close-ended schemes
- **By Investment Objective**
  - Growth schemes/funds
  - Income schemes/funds
  - Gilt funds
  - Floating rate funds
  - Fixed maturity plans
  - Balanced schemes
    - Equity oriented balanced funds
    - Debt oriented balanced funds
  - Money market schemes
- **Other Schemes**
  - Index funds
  - Tax saving funds
  - Exchange traded funds
  - Gold exchange traded funds
  - Sector funds
  - Value funds
  - Hedge funds
  - Arbitrage funds
  - Fund of funds

Schemes according to the Investment Objective

A scheme can also be classified as a growth scheme, an income scheme, or a balanced scheme depending on its investment objective. Such schemes may be open-ended or close-ended schemes, as described earlier. They may be classified mainly as follows.

Growth/Equity Oriented Scheme

The aim of growth funds is to provide capital appreciation over the medium to long-term. Such schemes normally invest a major part of their corpus in equities

and have comparatively high risks. These schemes provide different options to the investors such as dividend option, capital appreciation, etc. and the investors may choose an option depending on their preferences. Investors must indicate the option in the application form. The mutual funds also allow the investors to change the options at a later date. Growth schemes are good for investors having a long-term outlook seeking appreciation over a period of time. A young investor whose time horizon is long-term and whose financial goals are also far away should opt for the growth option and a retired person who requires regular income may prefer the dividend option.

Income/Debt Oriented Scheme

The aim of income funds is to provide regular and steady income to investors. Such schemes generally invest in fixed income securities such as bonds, corporate debentures, government securities and money market instruments and are less risky compared to equity schemes. These funds are not affected by fluctuations in equity markets. However, the opportunities of capital appreciation are also limited. The NAVs of such funds are affected because of changes in interest rates in the country. If the interest rates fall, the NAVs of such funds are likely to increase in the short run and vice versa. However, long-term investors may not bother about these fluctuations.

Gilt Fund

These funds invest exclusively in government securities that have no default risk. NAVs of these schemes also fluctuate due to changes in interest rates and other economic factors as is the case with income or debt oriented schemes. There is no investment without risk. Gilt funds do not suffer from default risk but other risks such as interest rate risk, reinvestment risk, liquidity risk, inflation risk, etc. are part of all debt investments whether through the mutual fund route or directly.

Floating Rate Funds

Floating rate funds are those funds which pay a floating rate of interest. The rate is pegged to a benchmark rate. Whenever there is a change in the market interest rate, that change will automatically be incorporated in the floating rate fund and the investors will get that rate. When there is an upward trend of interest rate, it is advisable to put money in floating rate funds so that whenever there is an increase in the market interest rates, that increase will be reflected in the scheme. When interest rates are likely to come down, money should be invested in long term debt funds.

Fixed Maturity Plans

Fixed maturity plans are short-term debt instruments where investment is made for a fixed period, say 12 months or 13 months and investors cannot withdraw

money during that period. These days fixed maturity plans for 13 months are very common so that investors get double indexation benefit. They will pay longterm capital gain tax by taking advantage of the cost inflation index of two years.

Balanced Fund

The aim of balanced funds is to provide both growth and regular income as such schemes invest both in equities and fixed income securities in the proportion indicated in their offer documents. These are appropriate for investors looking for moderate growth. They are also affected because of fluctuations in share prices in the stock markets. However, the NAVs of such funds are likely to be less volatile compared to pure equity funds.

Equity Oriented Balanced Funds

Equity oriented balanced funds are those funds which invest minimum 65% of the amount mobilized in equity and equity related instruments, and the remaining in debt instruments. The tax treatment of these funds is that of equity funds.

Debt Oriented Balanced Funds

Debt oriented balanced funds invest less than 65% of the corpus in equity and equity related instruments and the remaining in debt instruments. The benefit of investing in balanced funds is that investors will not have to do any re-balancing in asset allocation if the asset allocation changes due to stock market movements. The re-balancing will be done by the fund manager.

Money Market or Liquid Fund

These funds are also income funds and their aim is to provide easy liquidity, preservation of capital and moderate income. These schemes invest exclusively in safer short-term instruments such as treasury bills, certificates of deposit, commercial paper and inter-bank call money, government securities, etc. Returns on these schemes fluctuate much less compared to other funds. These funds are appropriate for corporate and individual investors as a means to park their surplus funds for short periods.

Index Funds

In a simple equity fund such as a diversified equity fund, the fund manager has the mandate to create an investment portfolio of equity shares according to his understanding of valuations and returns in the equity market and as per the fundamental and technical analysis done by the research team of the fund management department. This style of selection of securities based on the track record of performance and expectations is called active fund management style.

The alternative way of creating an equity portfolio for investors is to avoid taking a view on the performance of companies as that may not always prove true, and instead focus on creating a diversified portfolio that simply replicates an index. The mutual fund will select one of the indices as benchmark and invest the amount mobilized, only in those companies which form that particular index and in the same proportion.

Suppose the NSE Nifty 50 is the benchmark for ABC fund's index fund scheme and Company X forms 5% of the market capitalization of NIFTY. If the AMC has mobilized Rs. 100 crore in this index fund, it will invest 5% of this, i.e. Rs. 5 crore in company X. The only activity the fund manager has to perform in the case of an index fund is to track the index. Whenever the weightage of any of the securities is rising or falling, the adjustment has to be made in the portfolio composition also. NAVs of such schemes rise or fall in accordance with the rise or fall in the index, though not exactly by the same percentage due to factors known as "tracking error" in technical terms. Necessary disclosures in this regard are made in the offer document of the mutual fund scheme.

Since this fund will be investing money only in the market index, investors will be subject to only systematic risk because it is a diversified scheme. Lack of active management gives the advantage of lower fees. The disadvantage of index funds is that there is no scope of out performance.

Tracking error

The difference between the index performance and the fund performance is known as trekking error. Whenever an index changes, the fund is faced with the prospect of selling all stocks that have been removed from the index. The price of the stocks that have been added to the index tends to be driven up. An Index fund has to sell stocks where the price has depressed and buy the stocks where the prices have appreciated. Here arises the trekking error.

Tax Saving Funds

These schemes offer tax rebates to the investors under specific provisions of the Income Tax Act, 1961 as the government offers tax incentives for investment in specified avenues, e.g. equity linked savings schemes (ELSS). Pension schemes launched by the mutual funds also offer tax benefits. These schemes are growth oriented and invest predominantly in equities. Their growth opportunities and the associated risks are like any equity oriented scheme. An investment of up to Rs. 1,00,000 will give the investor a tax exemption under section 80C of the Income Tax Act. There is a lock-in period of three years in the case of ELSS. They give a better return than diversified equity funds because of the 3 year lock-in period as the fund manager has no redemption pressure for 3 years like other open-ended equity schemes.

Exchange Traded Funds

ETF's are a basket of securities that are traded like individual stocks on an exchange. These funds invest in the securities that are mentioned in the offer document. These are innovative products which came into existence in USA in 1993. About 60% of trading volumes on the American stock exchange is from ETF's. Like Index funds these are also passively managed funds. Units can be bought and sold directly on the exchange. These funds have all the advantages of diversification, low cost and transparency. Collection and disbursement charges are also reduced.

Long term investors will not suffer because of inflows and outflows by short term investors as the fund structure is such that it does not have to bear extra cost due to frequent subscriptions and redemptions. Tracking error is likely to be low as compared to index funds. ETFs can be used as a tool for gaining instant exposure to equity markets, equitizing cash and for arbitrage between the cash and futures market.

The first ETF scheme in India was the Nifty BeES (Nifty Benchmark Exchange Traded Scheme) based on S&P CNX. Nifty was launched by Benchmark Mutual Fund in January, 2002. Each Nifty BeES is equal to approximately 1/10 th of the S&P CNX Nifty. One can buy Nifty BeES just like any other share. These securities are in dematerialized form and are settled like any other share in rolling settlement.

Junior BeES, an exchange traded scheme was introduced with effect from 6 March, 2003. Liquid BeES (Liquid Benchmark Exchange Traded Fund) is the first money market ETF in the world. Liquid BeES is traded on NSE's capital market segment and settled on a rolling settlement on a T+2 basis. Recently, SEBI has given permission to mutual funds to launch gold exchange traded funds.

Gold Exchange Traded Funds

Gold ETF is typically, an exchange traded mutual fund scheme listed and traded on a stock exchange. Gold is the underlying asset for the units of that fund.

Every gold ETF unit represents a definite quantum of pure gold say, one gram (0.5 gram) of gold and the traded price of that gold unit moves in tandem with the price of the actual gold metal as is traded in any big gold merchant or in any metal exchange.

A mutual fund house launching a gold ETF appoints authorized participants who initially buy the units of the gold ETF from the mutual fund by exchanging actual pure gold for the units of the gold ETF. These authorized participants facilitate secondary market trading of the gold ETF units through the stock exchange, where investors can buy or sell gold units on payment, for quantities as small as one unit.

The underlying asset — gold — is held by a mutual fund house issuing such units either in a physical form or through a 'gold receipt' giving right of ownership. Authorized participants can go back to the mutual fund house to redeem the gold ETF units and can demand equivalent value of actual pure gold at any time.

In India, gold is traditionally acquired in the form of jewellery, which is most often passed on from one generation to another and is thus, also a significant means of saving for the family. India is the world's largest consumer of gold jewellery.

For the retail investor, it will facilitate easy buying of standard quality gold in small units without the hassle of safekeeping of the precious metal and cost of insurance.

Gold ETFs have the potential to increase mobilization of gold and are expected to increase hallmarking of the metal.

Regulated mutual funds with strong brand identity would provide comfort for retail investors to deal in gold through them.

Gold ETFs will provide a screen-based platform to investors to accumulate quality gold in small lots. For example, a father wanting to gift gold to his daughter need not buy the metal (or the jewellery) only when he intends to gift it to her; instead he can start buying it in small lots.

It offers a good diversification and reduces overall risk/volatility of investments.

Sector Funds

Sector funds are mutual fund schemes that restrict their investments to a particular segment or sector of the economy. These funds concentrate on one industry such as infrastructure, health care, utilities, pharmaceuticals, IT, etc. These funds tend to be more volatile than the funds holding a diversified portfolio of securities in many industries. Such a concentrated portfolio can produce tremendous gains or losses depending on whether the chosen sector is in or out of favor.

Value Funds

A value fund is the scheme of a mutual fund that hold value stocks or stocks deemed to be undervalued in price. Every mutual fund has value fund schemes that search for stocks that are undervalued by the market or in other words, these stocks have a higher intrinsic value than its market price. The premise of value investing is that the market has inherent inefficiencies that enable companies to trade at levels below what they are actually worth. Once the market corrects these inefficiencies the value investor will see the stock price rise.

Let us take an example. Suppose the intrinsic value of XY Ltd's share as per fundamentals, growth prospects and expected dividend is Rs. 45 and the share is

trading in the stock market at Rs. 34. Value funds will buy these types of stocks. These stocks are ignored by the market but sooner or later the market will realize the worth of this share and the price will move to its intrinsic value, i.e. Rs. 45.

Hedge Funds

These funds, like mutual funds, collect money from investors and use the proceeds to buy stocks and bonds. Unlike mutual funds however, hedge funds typically take long and short positions in assets to lower portfolio risk arising from broad market movements. A hedge fund may take long positions in certain stocks and short positions in certain others so that their portfolio beta is close to zero. A beta close to zero means that the portfolio will remain relatively unchanged due to the broad market movement. Such a portfolio will primarily change if the stocks move more than the broad market

For example, consider two stocks X and Y. The hedge fund may buy X and short Y, so that the portfolio beta is close to zero. Suppose X moves up by 10 percent, and Y and the broad market move up by 7 percent; the fund's net gain will be 3 percent. This is because X outperformed the market, which is precisely what the hedge fund was betting on when it constructed the portfolio. In short, hedge funds generate security-specific returns and attempt to lower market risk.

To improve their security-specific returns hedge funds leverage their portfolio. The fund may collect say, Rs. 100 crore from investors, borrow Rs. 50 crore, and invest Rs. 150 crore. In the above instance, an unleveraged fund may have gained only 3 percent of Rs. 100 crore. But a hedge fund that has borrowed Rs. 50 crore will gain 3 percent on Rs. 150 crore, less interest cost on Rs. 50 crore.

A hedge fund is a fund that can take both long and short positions, use arbitrage, buy and sell undervalued securities, trade options or bonds, and invest in almost any opportunity in any market where it foresees impressive gains at reduced risk**.** The primary aim of most hedge funds is to reduce volatility and risk while attempting to preserve capital and deliver positive returns under all market conditions.

There are approximately 14 distinct investment strategies used by hedge funds, each offering different degrees of risk and return.

A macro hedge fund for example, invests in stock and bond markets and other investment opportunities such as currencies, in the hope of profiting on significant shifts in such things as global interest rates and countries' economic policies.

A macro hedge fund is more volatile but potentially faster growing than a distressed securities hedge fund that buys the equity or debt of companies about to enter or exit financial distress. An equity hedge fund may be global or country-specific, hedging against downturns in equity markets by shorting overvalued stocks or stock indexes.

A relative value hedge fund takes advantage of price or spread inefficiencies. Knowing and understanding the characteristics of the many different hedge fund strategies is essential for capitalizing on the variety of investment opportunities they offer.

Key Characteristics of Hedge Funds

- Hedge funds utilize a variety of financial instruments to reduce risk, enhance returns and minimize the correlation with equity and bond markets. Many hedge funds are flexible in their investment options (can use short selling, leverage, derivatives such as puts, calls, options, futures, etc.).
- Hedge funds vary enormously in terms of investment returns, volatility and risk. Many, but not all hedge fund strategies tend to hedge against downturns in the markets being traded.
- Many hedge funds have the ability to deliver non-market correlated returns.
- Many hedge funds have as an objective consistency of returns and capital preservation rather than magnitude of returns.
- Most hedge funds are managed by experienced investment professionals who are generally disciplined and diligent.
- Pension funds, endowments, insurance companies, private banks and high net worth individuals and families invest in hedge funds to minimize overall portfolio volatility and enhance returns.
- Most hedge fund managers are highly specialized and trade only within their area of expertise and competitive advantage.
- Hedge funds benefit by heavily weighting the hedge fund managers' remuneration towards performance incentives, thus attracting the best brains in the investment business. In addition, hedge fund managers usually have their own money invested in their fund.

Arbitrage Funds

Arbitrage is a strategy, which involves simultaneous purchase and sale of identical or equivalent instruments in two or more markets in order to benefit from a discrepancy in pricing. This strategy normally acts as a shield against market volatility as the buying and selling transactions offset each other.

This arbitrage strategy makes the fund immune to market volatility, i.e. the fund will not be affected by market fluctuations. Since the portfolio of arbitrage funds is completely hedged at all times to lower the risk of loss/erosion of gains, it also in turn caps the returns that the fund could have clocked if the portfolio was unhedged, i.e. these funds have a limited upside.

Despite the fact that arbitrage funds offer investors the opportunity to benefit from investments in equities by making use of derivatives, the fund

cannot be compared to conventional diversified equity funds, especially on the returns parameter.

The returns from arbitrage funds would typically be much lower than those of equity funds. That could be one reason why despite their equity holdings, arbitrage funds are benchmarked against indices like CRISIL Liquid Fund Index for want of a more appropriate index.

Fund of Funds

A Fund of Funds (FoF) is an investment fund that uses an investment strategy of holding a portfolio of other investment funds rather than investing directly in shares, bonds or other securities. This type of investing is often referred to as multi-manager investment.

Advantages

Investing in a collective investment scheme will increase diversity compared to a small investor holding a range of securities directly. Investing in a fund of funds arrangement will achieve even greater diversification.

An investment manager may actively manage your investment with a view to selecting the best securities. A FoF manager will select the best performing funds to invest in based upon the manager's performance. This additional level of selection can provide greater stability and take on some of the risk relating to the decisions of a single manager.

Disadvantages

Management fees for funds of funds are typically higher than those on traditional investment funds because they include part of the management fees charged by the underlying funds.

Since a fund of funds buys many different funds which themselves invest in many different securities, it is possible for the fund of funds to own the same stock through several different funds and it can be difficult to keep track of the overall holdings.

Funds of funds are often used when investing in *hedge funds* as they typically have a high minimum investment level compared to traditional investment funds which precludes many from investing directly. In addition, hedge fund investing is more complicated and higher risk than traditional collective investments. This lack of accessibility favors a FoF with a professional manager and built-in spread of risk.

8.8 HOW TO INVEST IN A MUTUAL FUND

1. Identify Your Investment Goals

Your financial goals will vary based on your age, life style, financial independence, family commitments, and level of income and expenses, among

many other factors. Therefore, the first step is to identify your goals and the time horizon of meeting these goals.

Your goals may be:

- Buying a car say after 5 years—required amount is Rs. 5 lakh
- Buying a home after say 10 years—required amount is Rs. 10 lakh; the rest will be financed
- Financing the marriage of sister after 2 years—estimated cost is around Rs. 3,50,000
- Providing for children's education after 15 years—required amount is say, Rs. 20,00,000
- Need to generate regular income
- Or a combination of all these needs

The avenue of investment will depend upon the quantum of risk you are willing to take, time horizon of your investments and cash inflow to invest that amount.

2. Choose the right Mutual Fund

The most important thing is to choose the right mutual fund scheme to suit your requirements. There are a variety of schemes available with every mutual fund. The offer document of the scheme tells you its objectives and provides other details like the track record of other schemes managed by the same fund manager. Some factors to evaluate before choosing a particular mutual fund are the track record of the performance of the fund over the last few years in relation to the appropriate benchmark and similar kinds of funds in the category. Other factors would be to study the portfolio allocation to know the diversification, the dividend history, and compounded annual growth rate/yield.

3. Diversify into Mutual Funds and Schemes

Do not put all the eggs into one basket. Investing in many schemes of just one mutual fund may not meet all your investment needs. You will have to spread your investments in various good performing funds. Here you have to also see the portfolio composition of every scheme so that there is proper diversification among many sectors. You should consider investing in a combination of schemes to achieve your specific goals.

4. Invest Regularly

The best approach is to invest a fixed amount at specific intervals, say every month. By investing a fixed sum each month you get the benefit of rupee cost averaging, i.e. you buy fewer units when the price is higher and more units when the price is low, thus bringing down your average cost per unit. This is a disciplined investment strategy followed by investors all over the world. This strategy is called systematic investment plan. Almost all fund houses have

systematic investment plans in most of their schemes. Those who have lump sum money can invest higher amounts and those who want to save every month or quarterly can avail the systematic investment plan facility offered by many open-end funds.

5. Start Early

It is desirable to start investing early and stick to a regular investment plan. If you start now, you will make more than if you wait and invest later. The power of compounding lets you earn income on income, and your money multiplies at a compounded rate of return. Let us take an example. A person starts investing Rs. 2,000 per month at age 20 and saves up to 60 years of age. Another person starts investing Rs. 2,000 per month at age 30 and saves up to age 60. If the rate of return on both the investments is 12% per annum convertible monthly, how much will be the difference in the accumulated value received by them at age 60?

The first person who started saving Rs. 2,000 per month at age 20 and saved till he is 60 will get Rs. 2,35,29,545 and the second person who started 10 years later will get only Rs. 69,89,928. The difference between the two is Rs. 1,65,39,617

6. Implementation/Investing Money

To invest money you will have to fill up the forms of the relevant mutual fund scheme. Forms are available with AMC's/distributors. You have to also enclose a cheque along with the application and submit it to the AMC. You will get an account statement which will give details about the units allotted, the sale price at which you have invested money and other details.

7. Monitoring the Investments

The investments once made, have to be monitored regularly. Although we will have invested in good performers, any financial plan which is not reviewed or re-balanced is a waste. Monitoring could be done 6 monthly or annually. Poor performing investments should be sold and shifted to good performers.

8.9 MUTUAL FUNDS—A GLOBALLY PROVEN INVESTMENT

All investments whether in equity shares, debentures or fixed deposits, bonds, etc. involve risk. Share value may go down depending upon the performance of the company, the industry, state of capital markets and the economy. Generally however, the longer the term, the lesser is the risk. Companies may default in payment of interest and principal on their debentures/bonds/deposits. While risk cannot be eliminated, skillful management can minimize risk. Mutual funds help to reduce risk through diversification and professional management. The experience and expertise of mutual fund managers in selecting fundamentally

sound securities and timing their purchases and sales help them to build a diversified portfolio that minimizes risk and maximizes returns. Investors have a wide selection of schemes to suit every type of client, of any age group and with any risk appetite.

8.10 RIGHTS OF A MUTUAL FUND UNIT HOLDER

A unit holder in a mutual fund scheme governed by the SEBI (mutual funds) regulations is entitled to:

1. Receive statements of accounts confirming the title within 30 days from the date of closure of the subscription
2. Receive information about the investment policies, investment objectives, financial position and general affairs of the scheme.
3. Receive dividend within 30 days of their declaration and receive the redemption or repurchase proceeds within 10 days from the date of redemption or repurchase.
4. If an investor fails to claim the dividend or redemption proceeds, he has the right to claim it up to a period of 3 years from the due date at the then prevailing NAV. After the expiry of this period, investors will be eligible to receive the amount at the NAV prevailing at the end of the 3rd year.
5. Vote in accordance with the regulations to:
   (a) Approve or disapprove any change in the fundamental investment policies of the scheme, which are likely to modify the scheme or affect the interest of the unit holder. The dissenting unit holder has a right to redeem the investment
   (b) Change the asset management company
   (c) Wind up the schemes
6. Inspect the documents of the mutual funds specified in the scheme's offer document.

8.11 PRECAUTIONS TO BE TAKEN WHILE INVESTING IN MUTUAL FUNDS

- One must keep a photocopy of the application. This will help to provide a record of the manner in which the application was filled and how it has been signed, as some investors have more than one style of signature.
- One should preserve the counterfoil/acknowledgement issued by the AMC/R&T agent till the statement of account has been received.
- Investments should be made in two names and the name of the nominee should also be mentioned.
- Cheques should be crossed and the application number should be written at the back of the cheque.

- Existing investors in the same scheme should quote their folio number so that holdings can be consolidated.

8.12 SOME FREQUENTLY ASKED QUESTIONS RELATED TO MUTUAL FUNDS

These questions will help the readers to know many provisions in mutual funda.

1. What is the Difference between a Load Fund and No-load Fund?

A load fund is one that charges a percentage of the NAV in the form of an entry or exit load. This means that each time one buys or sells units in the fund, a charge will be payable. This charge is used by the mutual fund for marketing and distribution expenses. Suppose the NAV per unit is Rs. 15. If the entry as well as exit load charged is 1%, then the investors who buy would be required to pay Rs. 15.15 and those who offer their units for repurchase to the mutual fund will get only Rs. 14.85 per unit.

Investors should take the loads into consideration while making investments as these affect their yields/returns. However, investors should also consider the performance track record and service standards of the mutual fund, which are more important. Good performing funds may give higher returns in spite of charging higher loads.

A no-load fund is one that does not charge an entry or exit load. This means that the investors can enter the fund/scheme at the NAV and exit at the NAV. No additional charges are payable on purchase or sale of units.

2. Can a Mutual Fund Impose Fresh Load or Increase the Load Beyond the Level Mentioned in the Offer Documents?

Mutual funds can increase or decrease loads on the schemes but they have to amend their offer documents so that new investors are aware of loads at the time of investments and till the time the offer document is amended, they have to send this information in the form of addendums to the offer document. Any change in the load will be applicable only to prospective investments and not to the original investments.

3. What is Sales Price and Repurchase/Redemption Price?

Sales price is the price which a prospective investor has to pay per unit while buying units of a mutual fund scheme. Sales price will be equal to the NAV when there is no load charged by the fund. Sales price will be higher than the NAV when the fund charges an entry load as with this the investor has to pay more per unit than the present NAV. Repurchase or redemption price is the price

at which an open-ended scheme purchases or redeems its units from the unit holders. This means that while selling back his holding to the mutual fund, he will get a lower price than the present NAV. With an exit load, the repurchase price becomes less than the present NAV.

4. What is an Assured Return Scheme?

Assured return schemes are schemes that assure a specific return to the unit holders irrespective of performance of the scheme. A scheme cannot promise returns unless such returns are fully guaranteed by the sponsor or AMC and this is required to be disclosed in the offer document. Investors should carefully read the offer document to determine whether return is assured for the entire period of the scheme or only for a certain period. Some schemes assure returns for one year at a time and they review and change it at the beginning of the next year. At present no scheme comes with any assured returns. The only thing an investor has to see before investing is the past track record of performance of that scheme.

5. Can a Mutual Fund Change the Asset Allocation while Deploying Funds of Investors?

Considering the market trends, any prudent fund manager can change the asset allocation, i.e. he can invest a higher or lower percentage of the fund in equity or debt instruments compared to what is disclosed in the offer document. This can be done on a short-term basis on defensive considerations, i.e. to protect the NAV. Hence, the fund managers are allowed certain flexibility in altering the asset allocation considering the interest of the investors. In case the mutual fund wants to change the asset allocation on a permanent basis they are required to inform the unit holders and give them the option to exit the scheme at the prevailing NAV without any load.

6. How to Invest in a Scheme of a Mutual Fund?

Mutual funds normally come out with an advertisement in newspapers publishing the date of launch of the new schemes. Investors can also contact financial advisors and distributors of mutual funds who are spread across the country. They provide all the necessary information as well as application forms. Forms can be deposited with mutual funds through the advisors and distributors who provide such services. Nowadays, post offices and banks also distribute the units of mutual funds. However, investors have to be careful while selecting a good financial consultant and a good scheme.

Investors should not be carried away by commission/gifts given by agents/ distributors for investing in a particular scheme. They must consider the track record of the mutual fund and should take objective decisions.

7. Can a Non-resident Indian (NRIs) Invest in Mutual Funds?

Yes, non-resident Indians can also invest in mutual funds. The offer document provides a list of eligible persons who can invest in their schemes. NRIs must check that list before investing in that particular scheme.

8. What Amount should One Invest in Debt Funds or Equity Funds?

An investor has to consider various factors while allocating investments in equity funds or debt funds. Asset allocation will depend on age, income and risk appetite, and time horizon of investments. As a rule of thumb, percentage in debt instruments should be equal to one's age. As the age of a person increases, allocation to debt should also increase. A 30 year old should invest 30% of total investments in debt and the remaining 70% in equity. This percentage can be adjusted as per the time horizon and risk appetite. The schemes invest in different types of securities as disclosed in the offer documents and the various risks involved in investments are also explained in the offer document. Investors may also consult financial experts before taking decisions.

9. What should an Investor Look for in an Offer Document?

An offer document is a detailed document which provides complete information about the mutual fund and its schemes. It contains the following information:

- Summary information about the mutual fund, the scheme and the terms of offer
- Mandatory disclaimer clause as required by SEBI
- Glossary of terms used in the offer document
- Standard risk factors (systematic risk) and scheme specific risk factors (unsystematic risk)
- Details of sponsors, trustees and AMC
- Details of key personnel of the AMC
- Details of the fund constituents
- Fundamental attributes of the scheme (objectives, terms with regard to liquidity, fees and expenses, valuation norms, etc.)
- Details about initial issue expenses and recurring expenses
- Unit holders' rights
- Associate transactions

An abridged version of the offer document called key information memorandum, contains very useful information in a summarized form. This is given to the prospective investor by the mutual fund. The application form for subscription to a scheme is an integral part of the key information memorandum. SEBI has prescribed certain minimum disclosures that have to be made in the offer document.

Before investing in a scheme an investor should carefully read the offer document. Due care must be given to portions relating to the main features of the scheme, risk factors, initial issue expenses and recurring expenses to be charged to the scheme, entry or exit loads, sponsor's track record, educational qualification and work experience of key personnel including fund managers, performance of other schemes launched by the mutual fund in the past, pending litigations and penalties imposed, etc.

10. When will the Investor get a Certificate or Statement of Account after Investing in a Mutual Fund?

Mutual funds are required to dispatch statements of accounts within six weeks from the date of closure of the initial subscription of the scheme. In case of close-ended schemes, if the scheme is listed on the stock exchange, investors will get either a demat account statement or unit certificates as these are traded in the stock exchanges. In case of open-ended schemes, a statement of account is issued by the mutual fund within 30 days from the date of closure of the new fund offer of the scheme. The procedure for repurchase is mentioned in the offer document.

11. As a Unit Holder, How Much Time will it Take to Receive Dividends/repurchase Proceeds?

A mutual fund is required to dispatch the dividend warrants to investors within 30 days of the declaration of the dividend and the redemption or repurchase proceeds within 10 working days from the date of redemption or repurchase request being made by the unit holder.

In case of failures to dispatch the redemption/repurchase proceeds within the stipulated time period, the asset management company is liable to pay interest he rate of 15% per annum as specified by SEBI from time to time

12. Can a Mutual Fund Change the Nature of the Scheme From the One Specified in the Offer Document?

Yes. However, no change in the nature or terms of the scheme, known as fundamental attributes of the scheme, e.g. structure, investment pattern, etc. can be carried out unless a written communication is sent to each unit holder and an advertisement is given in one English daily with nationwide circulation and in a newspaper published in the language of the region where the head office of the mutual fund is situated. The unit holders have the right to exit the scheme at the prevailing NAV without any exit load if they do not want to continue with the scheme. The mutual funds are also required to follow a similar procedure while converting the scheme from a close-ended to an open-ended scheme and in case of change in sponsor.

13. How will an Investor Know about the Changes, if any, which may Occur in the Mutual Fund?

There may be changes from time to time in a mutual fund. The mutual funds are required to inform any material changes to their unit holders. Apart from this, many mutual funds send quarterly newsletters to their investors.

At present, offer documents are required to be revised and updated at least once in two years. In the meantime, new investors are informed about the material changes by way of addendum to the offer document till the time the offer document is revised and reprinted.

14. How Does one know the Performance of a Mutual Fund Scheme?

The performance of a scheme is reflected in its net asset value (NAV) which is disclosed on a daily basis in case of open-ended schemes and on a weekly basis in case of close-ended schemes. The NAVs of mutual funds are required to be published in newspapers. The NAVs are also available on the websites of mutual funds and on the website of the Association of Mutual Funds in India (AMFI), www.amfiindia.com. Thus, investors can access the NAVs of all mutual funds at one place.

The mutual funds are also required to publish their performance in the form of half-yearly results which also include their returns/yields over a period of time, i.e. last six months, 1 year, 3 years, 5 years and since inception of schemes. Investors can also look into other details like percentage of expenses of total assets, as these have an affect on the yield and other useful information in the same half-yearly format.

The mutual funds are also required to send an annual report or abridged annual report to the unit holders at the end of the year.

Various studies on mutual fund schemes including yields of different schemes are published by financial newspapers on a weekly basis. Apart from these, many research agencies also publish research reports on the performance of mutual funds, including the ranking of various schemes in terms of their performance. Investors should study these reports and keep themselves informed about the performance of various schemes of different mutual funds.

Investors can compare the performance of their schemes with those of other mutual funds under the same category. They can also compare the performance of equity oriented schemes with benchmarks like BSE Sensitive Index, S&P CNX Nifty, etc.

Investors should decide when to enter or exit from a mutual fund scheme on the basis of the performance of the mutual funds.

15. How Does One know where the Mutual Fund Scheme has Invested Money Mobilized from Investors?

The mutual funds are required to disclose full portfolios of all of their schemes on a half-yearly basis; these are published in the newspapers. Some mutual funds send the portfolio list to their unit holders on a quarterly basis.

The scheme portfolio shows investments made in each security, i.e. equity, debentures, money market instruments, government securities, etc. and their quantity, market value and percentage to NAV. These portfolio statements are also required to disclose illiquid securities in the portfolio, investments made in rated and unrated debt securities, non-performing assets, (NPAs), etc.

Some of the mutual funds send newsletters to unit holders on a quarterly basis which also contain the portfolios of the schemes.

16. Is there a Difference between Investing in a Mutual Fund and in an Initial Public Offering (IPO) of a Company?

Yes, there is a difference between the two. IPO's of companies may open at a price that is lower or higher than the issue price, depending on market sentiment and perception of investors. After the issue is closed, shares will be listed at the stock exchange and on the day of listing, the price may be more or less than the price at which these were issued.

In case of new fund offer (NFO) of mutual funds, units are generally issued at par and the amount mobilized is invested in stocks, bonds, etc as per the objectives of the scheme. It will take some time for the NAV to increase and decrease. However, in the case of mutual funds, the par value of the units may not rise or fall immediately after allotment. A mutual fund scheme takes some time to make investment in securities. The NAV of the scheme depends on the value of securities in which the funds have been deployed.

17. When Two Schemes in the Same Category of Different Mutual Funds are available, should One Choose a Scheme with Lower NAV or Higher NAV?

Some investors have the tendency to prefer a scheme that is available at a lower NAV compared to the one available at a higher NAV. Sometimes, they prefer a new scheme which is issuing units at Rs. 10, whereas the existing schemes in the same category are available at much higher NAVs. Investors may please note that in case of mutual fund schemes, lower or higher NAVs of similar types of schemes of different mutual funds have no relevance. On the other hand, investors should choose a scheme based on its merit, considering performance track record of the mutual fund, service standards, professional management, etc. This is explained in an example given below.

Suppose scheme A is available at a NAV of Rs. 15 and another scheme B at Rs. 90. Both schemes are diversified equity oriented schemes. The investor has put Rs. 9,000 in each of the two schemes. He would get 600 units (9000/15) in scheme A and 100 units (9000/90) in scheme B. Assume that the markets go up by 10 percent and both the schemes perform equally well and it is reflected in their NAVs.

The NAV of scheme A would go up to Rs. 16.50 and that of scheme B to Rs. 99. Thus, the market value of investments would be Rs. 9,900 (600 × 16.50) in scheme A and it would be the same amount of Rs. 9,900 in scheme B (100 × 99). The investor would get the same return of 10% on his investment in each of the schemes. Thus, lower or higher NAV of the schemes and allotment of higher or lower number of units within the amount an investor is willing to invest, should not be the factors for making an investment decision. Likewise, if a new equity oriented scheme is being offered at Rs. 10 and an existing scheme is available for Rs. 90, it should not be a factor for decision-making by the investor. Similar is the case with income or debt oriented schemes.

On the other hand, it is likely that the better managed scheme with a higher NAV may give higher returns compared to a scheme which is available at a lower NAV but is not managed efficiently. The same is the case in the fall of the NAVs. Efficiently managed schemes at a higher NAV may not fall as much as an inefficiently managed scheme with a lower NAV. Therefore, the investor should give more weightage to the professional management of a scheme instead of lower NAV of any scheme. He may get much higher number of units at lower NAV, but the scheme may not give higher returns if it is not managed efficiently.

18. How to Choose a Scheme for Investment from a Number of Schemes available?

As already mentioned, investors must read the offer document of the mutual fund scheme very carefully. They should also look into the past track record of performance of the scheme or other schemes of the same mutual fund. They may also compare the performance with other schemes having similar investment objectives. Though past performance of a scheme is not an indicator of its future performance and good performance in the past may or may not be sustained in the future, this is one of the important factors for making an investment decision.

In case of debt oriented schemes, apart from looking into past returns, the investors should also see the quality of debt instruments which is reflected in their rating. A scheme with lower rate of return but having investments in better rated instruments may be safer. Similarly, in equity schemes also, investors may look for quality of portfolio. They may also seek the advice of experts.

19. Where can an Investor Look for Information on Mutual Funds?

Almost all mutual funds have their own websites. Investors can also access the NAVs, half-yearly results and portfolios of the mutual funds at the website of the Association of Mutual Funds in India (AMFI), www.amfiindia.com. AMFI has also published useful literature for investors.

Investors can also log on to the website of SEBI, www.sebi.gov.in and go to "Mutual Funds" section for information on SEBI regulations and guidelines, data on mutual funds, draft offer documents filed by mutual funds, addresses of mutual funds, etc. A lot of information on mutual funds is also given in the annual reports of SEBI which is available on the website

There are a number of other websites which give a lot of information on various schemes of mutual funds, including yields over a period of time. Many newspapers also publish useful information on mutual funds on a daily and weekly basis. Investors may approach their agents and distributors to guide them in this regard.

20. If a Mutual Fund Scheme is Wound up, What Happens to Money Invested?

In case of winding up of a scheme, the mutual funds pay the investor a sum based on the prevailing NAV after adjustment of expenses. Unit holders are entitled to receive a report on winding up from the mutual funds which gives all necessary details.

21. How can Investors Redress their Complaints?

The name of the contact person will be given in the offer document of the mutual fund scheme so that investors may approach them in case of any query, complaint or grievance. Trustees of a mutual fund monitor the activities of the mutual fund. The names of the directors of the asset management company and the trustees are also given in the offer documents. Investors can also approach SEBI for redressal of their complaints. On receipt of complaints, SEBI takes up the matter with the concerned mutual fund and follows up with them till the matter is resolved.

CHAPTER

9

Case Studies for Practice

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- *The points to be considered while making a financial plan*
- *14 practice case studies on the basis of live information, with recommendations*

9.1 FINANCIAL PLAN CONSTRUCTION

Financial planning brings to mind, counsel for the person with so much money that he needs help in deciding where it should be placed properly. People invest money for their future needs in various investment avenues depending on their own understanding and the products recommended by advisors.

Sometimes, an investor may put all the money in technology stocks thinking that the return will be extremely good. Here, a financial planner will explain the importance of diversification while building a portfolio. Furthermore, the diversification needs to work at various levels. For example, within each asset class it is pertinent to be invested across multiple instruments; similarly, the portfolio should be diversified across various asset classes as well.

Equities give good returns over longer time frames and even sometimes outperform other investment avenues like gold, property and bonds. However, over shorter time frames equities also hold the potential to be a very risky asset class and expose the portfolio to high levels of volatility. This is the primary reason why any financial planner will always recommend equity investment for a time horizon of over 3–5 years.

Financial Planners also look at an investor's age while recommending equity. A person closer to retirement will have low risk appetite and a larger percentage of his portfolio will go towards debt and less in equity. A young investor will have a high risk appetite and long time horizon and therefore, a financial planner will do the asset allocation in various asset classes like equity, debt, gold and real estate, etc

Financial planning to take care of the post-retirement years is always an important activity for individuals. With respect to retirement planning, clients have to make a choice of whether to invest in a pension plan offered by a life insurance company or go on investing in mutual funds and after retirement to decide about investments which can provide him with a regular flow of income. A financial planner will analyze the various options available, and then recommend the best products to the clients.

Making provisions for a regular and stable monthly income is among the most common requests which will be received by financial planners. For example, a 50-year old person who wanted to plan for a monthly income starting 5 years hence, i.e. at the age of 55, approaches a financial planner. The investment tenure is of 5 years and the client had an appetite for high risk investment avenues. The financial planner has to recommend to him those investments which will provide him with a regular flow of income starting after 5 years, keeping in mind his risk appetite, age, time horizon and the track record of investments.

Financial planners have to follow a certain code of ethics while drawing financial plans for their clients. They will recommend only ethical investments. Financial planners are like financial doctors who take care of each and every aspect of a person's finances. Investors in India are not aware of the many good avenues of investment that are available, and which are safe and also provide good growth in the wealth of a person.

Slowly, investors in India are becoming aware of the need for financial planning advice. Most investors put all their money in bank FD's, post office schemes, NSC and RBI bonds, etc. They also invest money in equity to provide growth to the portfolio. This understanding will be better given by a professional advisor who understands the various products and their risk and return attributes.

The financial plan has to be in a written format. The format of a written financial plan has been discussed in the beginning of this book. The plan should be presented in that format; it is an internationally accepted format.

When an investor approaches a financial planner with his financial details, the planner has to take account of all the investments, cash inflows and outflows. He has to follow a procedure which will take care of his requirements step by step. These steps are detailed as follows.

9.2 EMERGENCY PROVISION/PROVISION FOR CONTINGENCIES

The first thing a financial planner has to see is that the investor has adequate provision in the form of liquid cash or money market securities to take care of any emergency which may arise. As a rule of thumb, 4–6 months' expenses should be kept in the form of liquid money, i.e. cash, flexi-deposit or money market fund. However, this will depend on the age of the client. A retired client will require more money in the form of liquid cash than a younger client. There is no such fixed ratio (basic Liquidity ratio) which will be called an adequate ratio; it will depend from client to client. As a financial plan has to be a customized plan for every client, the amount of the emergency fund will also be different for every client.

9.3 INSURANCE REQUIREMENT

The second aspect a financial planner has to see is the amount of term insurance required for a client who is young and who has dependents. The amount of term insurance required can be calculated by the human life value method or with a need based approach. The insurance amount calculated with the help of HLV will see that the family gets a certain amount as the sum assured from the life insurance company, which will generate a regular income equivalent to the amount the earning member would have earned for the remainder of his working life. The required term insurance amount as per the need based method will be determined by calculating the present value of all the amounts required for the various goals., emergency funding, outstanding loan amountg and providing for regular expenses.

A client who is nearing retirement will not require any term insurance. He requires medical insurance. A young client will also require medical insurance but this will depend on any medical reimbursement available to him and his dependents from his employer during his span of service. Some employers even provide medical benefits after retirement for the entire life of the person and the spouse.

9.4 BUYING A RESIDENTIAL HOUSE

Having a residential house is also a major requirement. If the client is in a position to buy a house now, this can be discussed with the client. Buying a house will have pride of ownership and it can be used for self use or can be given on lease and rental income can be generated. Buying a house with a loan amount also gives tax benefits under Sec-80 C and under Sec-24 of Income Tax Act. Return on real estate is also much more than the rate of inflation. If the client is not keen on buying a residential house now, this goal can be ignored for the present or postponed for a few years.

Having a house also provides the advantage of reverse mortgage, where after retirement (after he exhausts all his savings) a person can mortgage the house and the reverse mortgage finance company will pay a regular monthly income depending on the value of the house and the number of years of requirement of income.

9.5 PROVIDING FOR OTHER FINANCIAL GOALS

After providing for all these goals, one can start providing for the other goals such as education of children, their marriage, one's own retirement or any other goal like estate building, as desired by the client. While planning for various goals the financial planner has to make the asset allocation depending on the age of the client, income level, time horizon and risk appetite.

The financial planner's job does not end with investing the client's money as per recommended investment avenues, but continues further as he has to monitor and review the plan at regular intervals as agreed with the client, and revise and re-balance it, if required.

While making a financial plan, the planner has to make certain assumptions regarding inflation rate, return on equity, balanced and debt investments, increase in salary/business income, etc. The assumptions will be based on the current economic conditions and scenario. These assumptions may keep changing with the changing scenario and conditions of the client and the economy.

9.6 ASSET ALLOCATION

To make a portfolio healthy there should be diversification across asset classes in order to facilitate better returns. The assets should be allocated in the right proportion according to the investment objective, age, income level, risk taking ability and time horizon of investments.

The investments should be selected from companies which have a good growth potential to enhance the value of the portfolio in future and to enable the client to meet his financial goals; and also to enjoy the fruits of good investments at the time when he has stopped working. The portfolio should be readjusted according to the fluctuations in the equity market and debt markets, and changes in the circumstances of the investor.

A healthy investment portfolio can be created only when utmost care is taken in choosing the right kind of assets, in the right proportion, at the right time, and in the right manner. Asset allocation is the right strategy of investing. The asset allocation pattern has to be reviewed regularly and if there is a need for re-balancing, it should be done without hesitation.

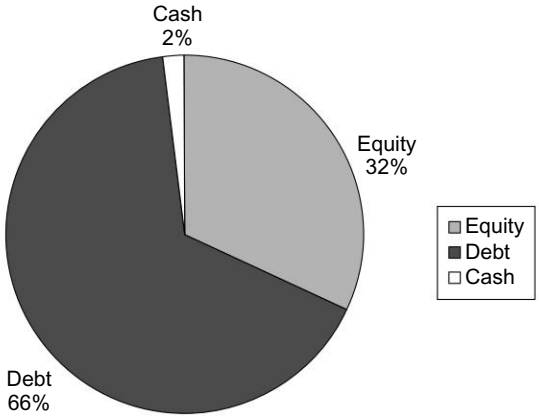

FIGURE 9.1 Existing Asset Allocation

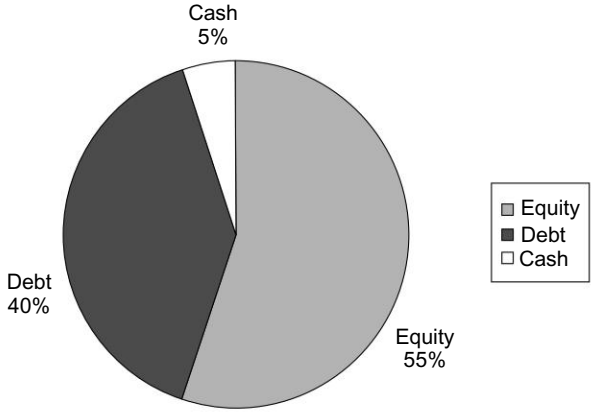

FIGURE 9.2 Revised Asset Allocation

9.7 ESTATE PLANNING

Estate planning is a very important part of a financial planner's job. Estate planning is different from estate building. Estate building means saving money for the next generation or in other words creation of wealth for the next generation. In case of rich clients, estate is automatically built as the income level is high and saving amount is also quite high. Estate planning means writing wills and power of attorney to transfer wealth to the next generation without any botheration to the beneficiaries.

Writing a will is not a legal but a financial necessity. Will making instills financial clarity and discipline. In India, we do not give importance to writing wills. A will decides the financial allocation of one's assets. A good will reduces the grounds for legal disputes after a person's death. All wealth creation and

management is incomplete without providing for its distribution in the event of the owner's death.

There are many cases pending in courts these days which are waiting for succession certificates as parents have died *intestate* (without writing a will). Financial planners have to create the awareness about the importance of wills among their clients. It is only the earning member who knows the type of investments made and the whereabouts of the relevant documents. A will serves as a ready reckoner for the surviving family members.

Financial planners have to inform their clients about the importance of writing wills. They are not expert in doing this as it is the job of a solicitor, but the issue must be emphasized by the financial planner.

Comprehensive financial planning involves taking care of every aspect of a clients' financial well being.

Some important clarifications about wills are as follows.

- A will need not be on a stamp paper; it can be made on ordinary paper and does not require fixing of any court fee, etc.
- It need not be registered although it is desirable to register do so
- A will need not necessarily be typed; it can be wholly in the handwriting of a person. Such wills are called holograph wills
- A will can be made for the benefit of a minor; however, a guardian has to be appointed till he becomes major
- A will can be made with certain conditions attached to it
- A will can be made to distribute movable as well as immovable property
- A will need not be only in favor of family members; the testator may write it in favor of any other person also but this may lead to disputes
- A will once made can be revoked, altered or amended, even if it is registered
- A Will can not be written for ancestral property as it has been passed on by survivorship.

9.8 PRACTICAL CASE STUDIES ON FINANCIAL PLANNING AND THE RECOMMENDATIONS

Live Case Studies for Practice

We will study a few live case studies which have been discussed with various clients and examine the recommendations suggested to them.

In these case studies efforts have been made to include various types of clients, i.e. young, middle aged, retired, nearing retirement and with various income levels, i.e. low income, moderate income and high income clients.

1. Mr. V.K. Malhotra is 30 years old and is a practising child specialist. His wife, Naina is a textile designer and works with a small factory. Their combined earnings are Rs. 6,00,000 per annum (net of taxes). Their present expenses are Rs. 3,60,000 per annum including premiums for term insurance policy worth Rs. 6 lakh sum assured. He has two daughters aged 6 years and 3 years.

Their financial assets are as follows:

	(Rs.)
PPF	2,00,000 (present value)
PO fixed deposit	1,00,000 (present value)
NSC'S	2,00,000 (invested amount 4 years ago)
Diversified equity	2,20,000 (present value)
Cash at bank (savings)	45,000
Money market mutual fund	1,00,000 (present value)
Total amount	7,15,000

Their financial goals are:

- To start own business by Naina after 4 years—required amount is Rs. 4,00,000
- To provide Rs. 25,00,000 for each daughter—required after 13 years and 16 years
- To buy a house worth Rs. 15,00,000 after 2 years with 80% financing and 20% of their own money
- To provide Rs. 5 lakh each, in today's terms, for their daughters' marriage after 19 years and 22 years, respectively
- To provide Rs. 1,50,000 per annum after 30 years, for the next 25 years, to meet post-retirement expenses.

Solution:

Contingency Fund Rs. 1,45,000 is lying in the form of liquid money for emergencies. This amount is more than 4 months expenses. Since they are a young couple this amount is adequate for emergencies.

Insurance Requirement They have insurance cover of only Rs. 6 lakh. They require an insurance coverage of Rs. 73 lakh (as per HLV). Since at present they have a term insurance of Rs. 6 lakh and the present value of investments is Rs. 7,90,000 they need additional term insurance worth Rs. 59 lakh (73 lakh – 6 lakh – 7.9 lakh). For this, they have to make a provision for payment of additional premium in their cash flow statement. They also require a family floater health insurance policy worth Rs. 5 lakh. They also have to make provision in the cash flow (household budget) for payment of health insurance premium of approximately Rs. 5,000 p.a.

Buying a Residential House They wish to buy a residential house worth Rs. 15,00,000 after 2 years with 80% financing and 20% self-financing. For

20%, they require Rs. 3,00,000 which will be arranged from maturity proceeds of NSC's. They will get Rs. 3,20,206. NSC's give 8% interest per annum and compounding is done semi-annually. The investment is for 6 years.

Providing for Other Goals Their monthly surplus is Rs. 20,000. The existing asset allocation and recommended asset allocation is given here in the form of pie charts.

Naina requires Rs. 4,00,000 after 4 years to start her new business. If we invest the money in an equity oriented balanced fund for 4 years and assume a return of 10% on balanced funds, they will have to save Rs. 6,812 per month for this goal.

To provide Rs. 25 lakh after13 years and 16 years, respectively, the money can be invested in a pure equity diversified funds since this is a long term horizon.. If we assume that equity will provide a return of 12% per annum, they have to invest Rs. 6,716.65 and Rs. 4,343 per month for both these goals.

The existing investments will also continue to grow. Proper asset allocation has to be made here too.

To provide for both daughters' marriage, we have to first increase the cost at the rate of inflation. The amount of money required in today's terms is Rs. 5,00,000 each, but it is required after 19 years and 22 years. If we assume an average inflation rate of 5% p.a. the cost after 19 years will be Rs. 12,63,475 and the cost after 22 years will be Rs. 14,62,630. To meet these costs have to save Rs. 1,458 and Rs. 1,140 per month respectively, if we assume a rate of return of 12% p.a. (diversified equity).

If we calculate the accumulated value of all the investments assuming that no investment has been encashed and when matured it has been invested as per the recommended asset allocation, we feel that this amount will be enough to take care of the needs after retirement. The income of Mr. Malhotra will also increase every year and Naina may also establish her business well and her income will continue to increase. We have to make a plan and then review it every year to keep making changes in the financial plan as and when required. Sometimes, when the required amount is not accumulated because of various factors, we may have to sell some investments to meet the requirements.

The amount required at age 60 to take care of needs after retirement assuming a return of 10% p.a. is Rs. 14,97,712. The accumulated amount of existing investments will be sufficient to take care of the needs after retirement. (We have ignored the impact of inflation as the amount required in this case is fixed, i.e. Rs. 1,50,000 per annum, at the beginning of every year.

Estate Planning Estate planning is a very important part of a financial planner's job. Estate planning means writing wills and power of attorney to transfer wealth to the next generation without any botheration to the beneficiaries.

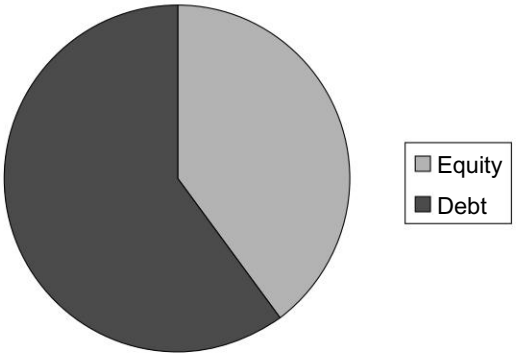

FIGURE 9.3 Existing Asset Allocation

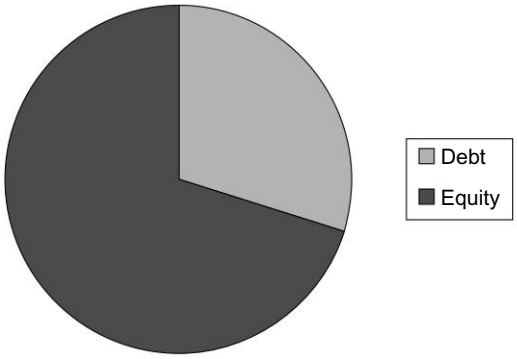

FIGURE 9.4 Recommended Asset Allocation

2. Mr. Ramaswamy is 56 years old and is working as Vice President with a public sector bank. He draws a salary of Rs. 30,000 p.m. (net of taxes) and will retire after 4 years .His expenses are Rs. 20,000 p.m. His wife is 50 years old and is a housewife. His two sons aged 25 and 23 are employed in very good establishments. Both are unmarried. He lives in his own flat in Mumbai. He plans to build a house on a plot of land bought by him near Mumbai after retirement so that he can generate a regular income from this house after retirement.

His present investments are as follows:	Rs.
RBI bonds (8% taxable)	1,00,000 (invested 3 years ago)
Mutual funds (diversified equity)	10,00,000 (present value)
Other deposits 5-year FD @ 9% p.a.	5,00,000 (bank FD, invested 4 years ago,
Direct stocks	25,0000 (present value)
PPF	8,00,000 (present value, started 11 years ago)

Expected retirement corpus	25,00,000
Savings a/c balance	1,25,000

He also contributes Rs. 50,000 every year towards PPF.

Following are the liabilities:

Outstanding housing loan	Rs. 5,00,000 (EMI of Rs. 2,800 p.m.)
Outstanding car loan	Rs. 3,50,000 (EMI of Rs. 2,700 p.m.)

The employer gives 100% reimbursement for medical expenses and will take care of medical needs even after retirement. He will get a pension of Rs. 19,000 p.m. which will take care of his annual living expenses after retirement.

He has approached you to provide for the following goals:

- To provide for elder son's marriage after 1 year—required amount Rs. 7,50,000
- To provide for younger son's marriage after 4 years—required sum is Rs. 9,00,000
- To build a house on a plot of land after retirement—required sum is Rs. 12,00,000

Solution:

Contingency Fund He has Rs. 1,25,000 in his savings account which is adequate in the form of emergency fund. The amount is more than 6 months of his expenses, which is sufficient considering his age.

Insurance Requirement His children are well settled in their jobs. Term insurance is required when children are young and there is a need for income replacement if something happens to the earning member. Regarding medical insurance, in this case he is given full reimbursement and his employer will take care of medical needs even after retirement; hence, there is no need for a medical insurance policy. In case the client feels that the amount reimbursed by his employer is not adequate, he may buy a medical insurance policy for an additional amount. He should buy a household insurance policy for protection of his residential house.

Buying a Residential House He lives in his own house and also has a plot of land on which he will construct a house after retirement. He has planned well for his real estate investment. The only thing to be considered is to pay off all loans before retirement. In this case the outstanding loan amount is small and there is no worry on this front also.

Providing for Other Goals The first goal is to spend Rs. 7,50,000 after one year on his elder son's marriage. The bank FD of Rs. 5,00,000 will mature after one year and it will give maturity proceeds of Rs. 7,80,255. Bank FD's give interest quarterly and compounding is done quarterly. This amount can be used for his son's marriage.

The second goal is to spend Rs. 9,00,000 after 4 years on his younger son's marriage.

RBI bonds will mature after 3 years and the accumulated amount of Rs. 1,60,103 will be invested in a liquid fund for one year and at the return of 5% p.a. It will become Rs. 1,68,108. PPF will also mature after 4 years and the accumulated amount at a rate of return of 8% on (Rs. 8,00,000 + Rs. 50,000 every year for 4 years) will become Rs. 13,13,697.

Of the total accumulated amount (Rs. 1,68,108 + Rs. 13,13,697 = Rs. 14,81,805), Rs. 9,00,000 will be spent on the marriages and the remaining amount of Rs. 5,81,805 will remain in the savings account as he has to construct a house after retirement.

The third goal is to spend Rs. 12,00,000 on constructing a house so that it can generate a regular income for him after retirement. There is Rs. 5,81,000 in the savings account.

He has a salary of Rs. 30,000 p.m. of which Rs. 20,000 is spent every month on living expenses and Rs. 5,500 goes towards loan EMI's. The surplus of Rs. 4,500 per month is invested in a balanced fund which generates a return of 10% p.a. and will accumulate to Rs. 2,64,251 at the time of retirement. A total amount of Rs. 8,46,056 is available to him for constructing a house. The required amount is Rs. 12 lakh. The balance amount will be used from his retirement corpus of Rs. 25 lakh.

After providing for all the goals, we have to examine his asset allocation and invest the rest of the retirement corpus as per the required asset allocation. In this case, there will be no PPF and Bank FD. RBI bonds also have matured. Now the retirement corpus should be invested in debt instruments since he does not require a monthly income as his pension income is sufficient to take care of his regular expenses, and after it is constructed the house also will generate rental income.

Diversified equity through the mutual fund route and direct stocks will also have appreciated in value at the time of retirement. Asset allocation at the time of retirement will be done after calculating the market value of equity investment. The ratio should be 60% in debt and 40% in equity. This ratio can be different depending on the risk appetite of Mr. Ramaswamy. He has provided for all his goals, his pension income is also adequate and his house will also generate income. He can even think of putting more money in equity, say 50%.

Recommended asset allocation after retirement is 60% in debt and 40% in equity.

Estate Planning Estate planning is a very important part of comprehensive financial planning. Writing of a will is a very important aspect in a person's life to ensure that assets can be transferred to the next generation easily.

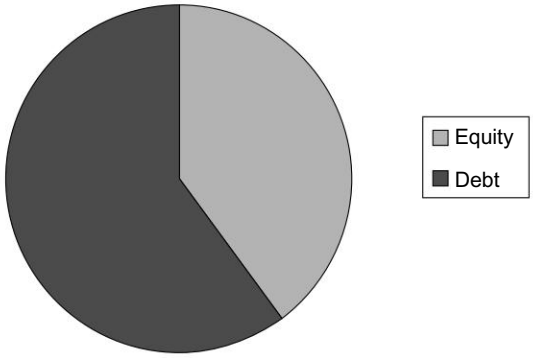

FIGURE 9.5 Recommended Asset Allocation

3. Mr. Rohit Khurana is 30 years old and works with a private sector insurance company as a Manager. He is married and his wife Smita is working as a teacher in a government school. His daughter Aisha is 2 years old. He lives with his parents in their own house and has no plans to purchase a house.

His salary per month	Rs. 38,000 (net of taxes)
Smita's salary per month	Rs. 20,000 (net of taxes)
Expenses per month	Rs. 30,000
Savings account balance	Rs. 69,000

His goals are:

Short term: To buy a car worth Rs. 5,00,000 after 2 years without taking a loan

Medium term: To take his parents and wife on a trip to Europe after 5 years — approximate cost Rs. 9,00,000 in today's terms

Long term:

1. To save for his daughter's higher education starting after 17 years — cost in present terms is Rs. 12,00,000
2. To save systematically for his daughter's marriage after 23 years — cost in present terms is Rs. 10,00,000.

His present investments are:

PPF	Rs. 2,25,000 (started contributing Rs. 70,000 every year, 3 years ago)
ELSS	Rs. 75,000 (value as of today)
Diversified equity	Rs. 50,000 (value as of today)
RBI bonds (8% taxable)	Rs. 2,50,000 (bought 3 years ago with a cumulative option)
Wipro shares	Rs. 1,50,000 (present value)
MMMF	Rs. 1,25,000 (present value)

Solution:

Contingency Fund He has Rs. 1,94,000 in liquid form, i.e. savings account and liquid fund. Expenses per month are Rs. 30,000 per month. The emergency fund is sufficient as it covers 6.46 months of expenses. There is no need to keep any more money in liquid form.

Insurance Requirement He should buy a term insurance policy for a sum assured of Rs. 42 lakh (Rs. 50 lakh as per HLV method — Rs. 8 lakh worth investment). The logic of reducing existing investments from the required amount of insurance is that a considerable amount will be available with the family. He also does not have a medical insurance policy. He should buy a family floater medical policy for an amount of Rs. 5 lakh to take care of the medical needs of the family.

Buying a Residential House He lives with his parents in their own house and has no plans to buy a house. He can invest in another property whenever he has the funds, for the sake of diversification of investments. Real estate generates a return above the rate of inflation and it helps in creation of wealth.

Providing for Other Goals When a household budget is made for him, there is a surplus monthly income of Rs. 28,000.

The first goal is to buy a car after 2 years. We have two options here. He could invest every month for two years to achieve this goal. In this option, his time horizon is only two years. Therefore, we can not recommend equity investment. If the time horizon is less then 3–4 years equity investment should not be recommended. For a horizon of two years, a debt investment is the better option. If we assume that he gets a return of 8% p.a. on his investment, he will have to invest Rs. 19,280.31 per month to get Rs. 5,00,000 after 2 years.

The second goal is to go to Europe after 5 years; cost in today's terms is Rs. 9,00,000. The cost after 5 years will be Rs. 11,48,653 if we take an inflation rate of 5% p.a. He can save a maximum of Rs. 28,000 per month for 3 years, as for the first two years he has invested for the purpose of buying a car. In the first two years, after saving Rs. 19,280 per month for the goal of funding the car, he had a surplus of Rs. 8,720 per month which would have become Rs. 2,26,138 at a return of 8% p.a. had he invested for two years Rs. 28,000 per month will be invested for 3 years and the amount of Rs. 2,26,138 will also grow depending upon which investment has been selected for this. If Rs. 28,000 per month is invested so that it generates a return of 12% p.a. it will accumulate to Rs. 12,06,153 and along with his other investment of Rs. 2,26,138 it will provide enough money to go to Europe.

The third goal is to provide for his daughter's education after 17 years; the required amount in today's terms is Rs. 12,00,000. If we assume an increase of 5% p.a. in the cost of education, the required amount after 17 years will be

Rs. 27,50,422. During the first 5 years he has been saving for buying a car and to accumulate money for the trip to Europe.

He has to accumulate money for his daughter's education in 12 years instead of 17. To accumulate that amount, Mr. Rohit Khurana has to invest Rs. 8,620.34 (rounded off to Rs. 8,620) at a return of 12% p.a. Since the time horizon is long term, money can be invested in equity funds.

The last goal is to provide a sum of Rs. 10, 00,000 in today's terms, for his daughter's marriage. The required amount after 23 years, if inflation rate is assumed to be 5% p.a. will be Rs. 30,71,524. To accumulate that amount in 18 years, since he can not save for this goal fir the first five years, he will have to invest Rs. 4,053 per month at a return of 12% p.a. He has sufficient surplus money to accumulate the required amounts.

There will be increase in salary income also during these years. Smita's income will also increase every year. Since we have to review the plan every year, we will keep making the required changes in the plan.

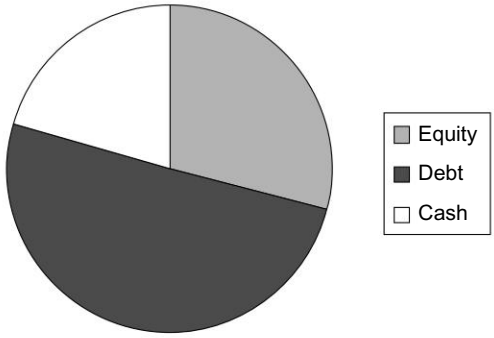

FIGURE 9.6 Existing Asset Allocation

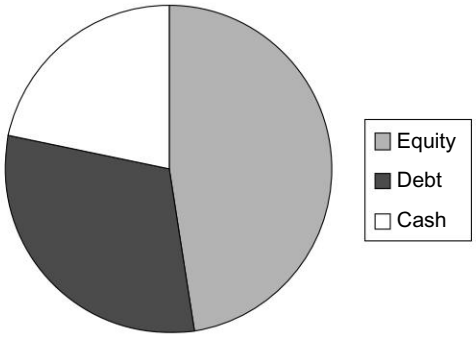

FIGURE 9.7 Recommended Asset Allocation

Estate Planning As part of his comprehensive financial planning he must write a will so that assets can be transferred to the next generation easily.

4. Mr. Mehrotra is 55 years old and runs a stationery shop in his locality. He is able to earn on an average Rs. 36,000 p.m. He has purchased a two bedroom apartment and has paid the last installment of the loan last month His wife is a homemaker. He has two children; his son is studying in the final year of engineering and daughter will be getting married in 6 months. He has provided for his daughter's marriage. If his son pursues MBA after graduation, he may get a scholarship. If he does, he will require an amount of Rs. 12,00,000 after 6 months.

Short term goal: To provide for higher education for his son costing around Rs. 12, 00,000 after 6 months.

Long term goals:

- To maintain same standard of living after leaving work at age 65. Life expectancy is 80 years
- To leave an estate of Rs. 50 lakh for his son

His present investments after providing for daughter's marriage are as follows:

PPF	Rs 6,00,000 (present value)
Blue chip shares	Rs. 3,50,000 (present value)
Master share	Rs. 2,50,000 (present value)
Diversified equity	Rs. 16,00,000 (present value)
Plot of land	Rs. 20,00,000 (present value)
NSC'S	Rs. 3,50,000 (invested amount, maturing after 1 month

Present expenses per month are Rs. 20,000.

Contingency Fund He has no balance in his savings account to can take care of emergency needs. He has to maintain at least Rs. 1,00,000 in liquid form either in the form of cash in savings account/flexi-deposit account or in the liquid fund of a mutual Fund. NSC will mature after one month and he will get Rs. 5,60,361. Out of this, Rs. 1,00,000 will be put in liquid form for a contingency fund and the remaining amount of Rs. 4,60,361 will be invested for 6 months in a liquid fund which will generate an average return of 5.5%p.a.

Insurance Requirement He is 55 years old and at this age no insurance company will give him a term insurance policy and even if it is available, the premium amount will be very high. The children in this case, are settled; the daughter is getting married and son is also in the final year of engineering. Therefore, there is no need of term insurance. Since he is a businessman there is no scope of an employer providing medical benefits; he should therefore purchase a medical insurance policy for himself and his wife, to provide for their medical needs. He should also buy a household insurance policy to protect his house against any unexpected loss.

Buying a Residential House He is staying in his own flat and also owns a plot of landand which will appreciate in value in the future.

Providing for Other Goals His first goal is to provide Rs. 12,00,000 after 6 months for the higher education of his son assuming he may not get a scholarship. This will be provided for after encashing his existing investments as the required amount cannot be accumulated in 6 month's. Rs. 4,60,361 which is in a liquid fund can be encashed and the remaining amount can be arranged from repurchase proceeds of a diversified equity fund. Only the required amount will be arranged through sale of diversified equity holdings. If the son gets a scholarship, this amount will grow to take care of other goals.

The second goal is to provide for a regular income after retirement at age 65, for another 15 years. He wishes to maintain the same standard of living after retirement. His present requirement is Rs. 20,000 per month. Requirement at age 65 will be Rs. 32,940 or approximately Rs. 33,000 in the first month after retirement if we assume an annual inflation rate of 5% p.a. To withdraw Rs. 33,000 per month at the beginning of every month for the next 15 years, he requires Rs. 42,56,566 if we assume the return on investment to be 10% and an inflation rate of 5% p.a. (real rate is 4.76% p.a.)

To accumulate this amount in 10 years, he will have to invest Rs. 18,503.69 per month at a return of 12% p.a. He has a surplus income of only Rs. 16,000 per month. The remaining amount will be arranged from his existing investments.

To leave an estate of Rs. 50,00,000 at age 80, he should have Rs. 9,13,481.30 at age 65 which if invested at a return of 12% p.a. will become Rs. 50,00,000. His existing investments will grow to considerably more than this amount in 10 years.

Estate Planning Estate planning is a very important part of comprehensive financial planning. Writing of will is very important aspect in a person's life so that assets can be transferred to the next generation easily. Financial planners will make clients aware about importance of making wills and power of attorney.

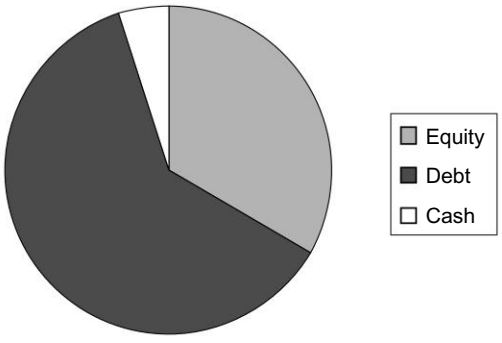

FIGURE 9.8 Required Asset Allocation at Age 65

He will be able to achieve all his goals and he will create an estate of more than Rs. 50, 00,000. The financial planner has to provide for all the goals of his client. The plan has to be reviewed frequently to keep up with changes in the client's own circumstances and changing economic conditions.

5. Mr. Gautam Saxena is 40 years old and works in a private sector bank as a relationship manager. He gets an annual salary of Rs. 4,32,000 (net of taxes). His wife, Shweta also works in a school as an administrative officer drawing a salary of Rs. 18,000 p.m. His father is retired and gets a pension of Rs. 10,000 p.m. which is sufficient to meet the expenses of both the parents. His expenses are Rs. 25,000 p.m. He also gets a dividend of Rs. 15,000 p.a. on his investment in UTI Master Shares.

He has two sons aged 9 years and 6 years. His parents wish to go to US next year to meet their daughter for which they require Rs. 3,00,000 in today's terms. He has bought a house recently worth Rs. 35 lakh, partly with a loan amount and partly with his father's money. For a loan of Rs. 20,00,000, he pays an EMI of Rs. 22,022 per month. His loan will be paid off by the time he retires. He wishes to send his children abroad for higher studies for which the present cost is assumed to be Rs. 7,00,000 each. The money for this is required after 11 and 14 years respectively.

His other investments are as follows:	Rs.
Cash at bank	1,25,000
Diversified equity (mutual funds)	2,50,000
PPF	1,00,000 (opened a year ago)
WIPRO stocks	5,00,000
RBI bonds (8% taxable)	3,00,000
Expected retirement benefits	35,00,000
Bond fund investment	1,50,000

You are requested to do the following:

(a) Set the goals, keeping in mind all his expected needs

(b) Determine how much he has to save every month in order to meet his goals?

(c) Proper asset allocation

You can make necessary assumptions regarding the rate of return, inflation, etc. while doing the financial planning for him.

Solution: Let us first make a monthly household budget for him. His monthly salary is Rs. 36,000 per month and his wife's salary is Rs. 18,000 per month. Total salary is Rs. 54,000. Rs. 25,000 are the monthly expenses of the family and Rs. 22,022 every month goes towards repayment of the housing loan. The surplus is Rs. 6,978 per month.

Contingency Fund Cash in the bank is Rs. 1,25,000. This amount is equal to 5 months of expenses and is sufficient for emergency funding.

Insurance Requirement He has not bought any term insurance policy but requires one worth Rs. 42 lakh (HLV method = 432000 = Pmt, bgn, 8 = *I*, 20 = *n*, Compute PV = Rs. 45,80,000. Existing investments are Rs. 3,50,000). Provision has to be made in the cash flow for the amount of premium necessary. For the outstanding housing loan amount he should buy mortgage redemption policy, which is reducing term insurance policy. If anything happens to the earning member the loan amount is recovered from insurance companies. He needs a household insurance policy also to protect his house from any calamities.

Buying a Residential House He has bought a house recently. Therefore, this goal is already provided for.

Providing for Other Goals His first goal is to provide the required sum for his parents to go to the US. The present cost is Rs. 3,00,000 which will increase to Rs. 3,15,000 after one year if we take an inflation rate of 5% p.a. His surplus monthly income is not adequate to accumulate the required amount in one year. He will have to redeem his existing investments for this goal. He can not withdraw from PPF as the account has been opened recently. If he sells diversified equity and assuming a return of 12% p.a. on this investment, he will get Rs. 2,80,000. The remaining amount of Rs. 35,000 will be withdrawn from the savings account. Later, he will have to transfer more money to the savings account in order to keep the emergency fund adequate.

He has to save money systematically for the goal of funding his sons' education. He must invest the surplus money every month in diversified equity schemes and have some exposure to sector funds also, since time horizon is long term. Their salary will also increase every year and they can save more in order to meet their goals. For the older son the amount required after 11 years will be Rs. 11,97,238 if inflation is 5% p.a. To accumulate this amount in 11 years, they will have to invest Rs. 4,404 per month at a return of 12% p.a.

The amount required for the younger son after 14 years is Rs. 13,85,952. To accumulate this amount at a return of 12% p.a. the required monthly saving is Rs. 3,207.50.

We also have to provide for the marriages of their children and their own retirement. The amount already invested will take care of both these needs. He also has to save on taxes every year; therefore it is recommended that Rs. 1,00,000 be invested every year in tax saving instruments like PPF, ELSS, NSC, insurance policy and bank FD for more than 5 years tenure.

Estate Planning Estate planning is a very important part of comprehensive financial planning. Writing of will is very important aspect in a person's life so that assets can be transferred to the next generation easily. Financial planners will make clients aware about importance of making wills and power of attorney.

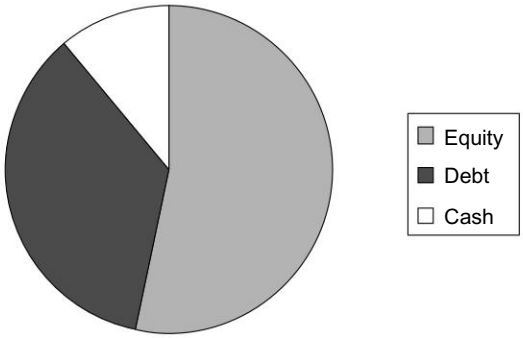

FIGURE 9.9 Recommended Asset Allocation

6. Mr. Raman Sharma is 27 years old and works as a Relationship Manager in a telecom company. His net salary per month is Rs. 32,000 and expenses are Rs. 10,000 per month. He stays in a rented accommodation, the rent of which is paid by his father out of his pension. He has bought an endowment plan recently in which the sum assured is Rs. 3,00,000. His other investments are Rs. 2,60,000 (present value) in diversified equity funds and Rs. 50,000 in a bank FD which will mature in 6 months. The maturity proceeds of Rs. 75,000 will be available on maturity. He has Rs. 1,00,000 in his savings bank account.

His financial goals are as follows:

To buy a house now, costing Rs. 20,00,000 for which 85% will be financed and 15% is to be paid by him

To get married in 6 months—estimated expenses are Rs. 75,000

To buy a car in 3 years costing Rs. 4,00,000 without taking a loan

Solution: From his household budget, we calculate that a surplus amount of Rs. 22,000 is available every month.

Contingency Fund He has Rs. 1,00,000 in his savings bank account which is more than adequate. He should keep Rs. 40,000 in his savings account for contingency provisions.

Insurance Requirement He has taken an endowment plan which provides a cover of Rs. 3,00,000 in the form of term insurance. As he does not have dependents now, he need not increase the term insurance cover. When he has children, this cover needs to be enhanced.

Buying a Residential House He has already planned for buying a house. To put a down payment of 15% he requires Rs. 3,00,000 which will be arranged by selling a diversified equity fund worth Rs. 2,60,000 and Rs. 40,000 from his savings account. The remaining amount of Rs. 20,000 in the savings account will be invested for 3 years in a balanced fund. For a loan amount of Rs. 17,00,000 the EMI will be Rs. 17,547 p.m. which he can pay from his

monthly surplus. By taking a loan he will also save on taxes under Sec-80C and Sec-24 of the Income Tax Act. The amount which he saves can be invested systematically in equity or debt, depending on the time horizon of investments.

Providing for Other Goals

His first goal is to get married in 6 months. He requires Rs. 75,000 which will be available on maturity proceeds of the bank FD.

His second goal is to buy a car for which he has to save money. To accumulate Rs. 4,00,000 in 3 years he will have to save Rs. 9,286 per month if the rate of return is 12% p.a.. After payment of the EMI, he is left with only Rs. 4,453 per month, which if invested at a return of 12% p.a. will accumulate to Rs. 1,91,821. Rs. 20,000 invested in a balanced fund will accumulate to Rs. 28,099. The savings under Sec-80C and Sec-24 of the Income Tax Act which he will also invest, will accumulate and can be withdrawn to buy a car. He will either have to take loan for the remaining amount or he may have to postpone buying a car for a few months.

Estate Planning Here we will emphasize on the importance of writing wills. There is no age to write a will. Once a person has accumulated certain assets, he should write a will.

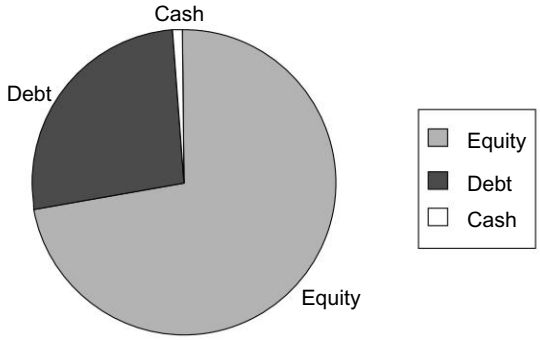

FIGURE 9.10 Required Asset Allocation at His Age

7. Mr. Sudhendu Sharma is 56 years old and is a senior bureaucrat based in Chennai. His wife is a housewife. All through his life he has been working for others and had very little time for his own financial planning. He will retire in two years. He is a worried man and is looking for some counseling. He has approached you for financial planning advice and is looking for ways and means of sustaining his life style.

He has provided you with following information:

	Rs.
Salary per month	45,000 (net of taxes)
Expected pension per month	25,000

	Rs
Monthly expenses	20,000
Equity portfolio (ITC shares)	15,00,000 (present value)
Savings account balance	1,45,000
Expected retirement benefits	22,00,000
Bank FD	5,00,000 (invested amount 4 years ago @7.5% p.a. maturing in a year)
RBI bonds (8% taxable)	10, 00,000 (nvested 4 years ago and maturing in 2 years)

The investments in bank FD and RBI bonds have been made 4 years earlier after consolidating his small investments.

He has also invested Rs. 11,0000 in NSC's 2 years earlier. His PPF account will mature in 2 years and he will get Rs. 5,45,000.

His financial goals are as follows.

- To buy a house within 6 months after retirement as he is living in government provided accommodation and can stay there for a maximum period of 6 months after retirement. He has identified a flat in Chennai at a cost of Rs. 25,00,000 which is expected to increase by 6% every year.
- His son is living in USA and he and his wife wish to visit him every two years. This year they went to USA and spent Rs. 1,50,000. The cost of future US trips will increase at a rate of inflation which is 6% p.a.
- His daughter is doing MBA from Australia and he has paid the last installment of her fee. He has to arrange his daughter's marriage in a year for which he requires Rs. 12,00,000.

His monthly expenses will come down to 80% of his last spend after retirement and his pension income will be sufficient. He can save the surplus money from his pension every month. You are required to make a financial plan which will take care of all these goals and also ensure that he has the cash inflow required for his US trip every two years.

Solution: If we make a household budget, he has Rs. 25,000 surplus every month for the next two years. His present asset allocation has been 35% in equity, 62% in debt and 3% in cash which is adequate for his age. After discussion, we can convince him to increase his allocation to equity to 40% after retirement.

Contingency Fund He has Rs. 1,45,000 in a savings account which is adequate for emergency provision.

Insurance Requirement At the age of 56 he does not require a term insurance policy but he should buy a mediclaim policy which will take care of medical expenses of himself and his wife. At present, family floater policies are available which will cover both of them. The policy will be operative if any one of them requires treatment.

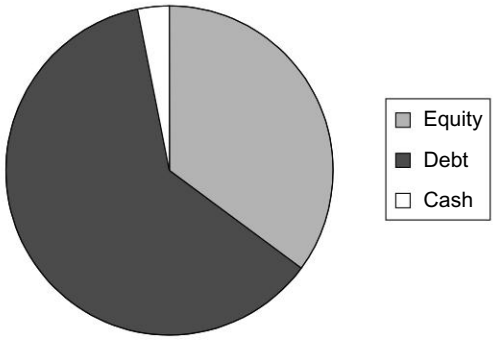

FIGURE 9.11 Recommended Asset Allocation

Buying a Residential House He has planned to buy a residence after retirement. Had he bought a house earlier he would have taken a housing loan and could avail of the benefits associated with it. If he buys a house now or after retirement, no bank will give him a housing loan and even if they do, the EMI will be very high. Therefore, he has to buy a house from his investments and retirement benefits. The goal of purchasing a house will come after the marriage of his daughter so it has to be provided for first.

Providing for Other Goals His immediate goal is to get his daughter married in one years for which the required amount is Rs. 12,00,000. The bank FD will mature and he will get Rs. 7,24,974 (500000 = PV, 1.875 = *I*, 20 = *n* Compute FV = Rs. 7,24,974. Bank FD gives quarterly compounding) If he invests the monthly surplus of Rs. 25,000 for one year in a debt instrument which provides a return of 8% per annum, he will get Rs. 3,11248. He is still short of Rs. 1,63,778 which will be arranged by selling ITC shares worth Rs. 2,00,000.

He has to buy a house after retirement. The cost of the house will increase to Rs. 39, 32,600 for which he has to use his accumulated savings and retirement benefits.

Equity after withdrawing Rs. 2,00,000 for daughter's marriage will grow to Rs. 17,53,750 if we assume that direct stocks will provide an average return of 15% p.a.

RBI bonds will mature at the time of retirement and will accumulate to Rs. 16,01,032.

PPF will also mature and provide Rs. 5,45,000

Retirement benefits are Rs. 22,00,000

Rs. 25,000 saved every month for one year at a return of 8% p.a. will accumulate to Rs. 3,11,248.

Here, we may recommend that he sells equity shares worth Rs. 7,50,000 and the remaining amount required for buying a house can be taken from the available amount of Rs. 46,57,280 (311248 + 2200000 + 1601032 + 545000) so

that asset allocation after retirement is 40% in equity, 58% in debt and 2% in liquid form. He also needs Rs. 1,68,540 for a US trip this year, which will be arranged from the accumulated amount.

For the next trip after 2 years, the amount will be arranged from maturity proceeds of NSC's and the remaining amount from his savings account. His surplus pension income can be invested every month either in a bank recurring deposit, debt funds of mutual funds or balanced funds considering his required asset allocation.

Estate Planning Estate planning is very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

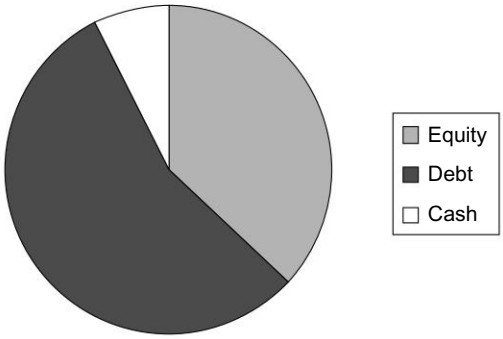

FIGURE 9.12 Required Asset Allocation

8. Mr. Deepanshu Mehra is 29 years old and works as a manager in a private bank. He has good career prospects in this organization. He is married and has two children; a son 4 years old and a daughter who is 6 months old. His wife Roopa is an MBA and has left her job to look after the children but will take up a job if required because of financial constraints, after the children have grown up. During our discussion with him, he has disclosed the following details:

	Rs.
Salary per annum	5,04,000 (take home salary)
Annual living expenses	3,00,000
Expected increase in salary per year	10%
Present investments are as follows:	
EPF	2,00,000
Savings account balance	1,20,000
NSC's bought recently	25,000

He has no other savings. He has bought a term insurance policy for a sum assured of Rs. 30,00,000.

His financial goals are as follows.

- To buy a car after 2 years worth Rs. 4,00,000 with his own savings.
- To purchase a flat after 6 years worth Rs. 25,00,000 with Rs. 20 lakh by a loan and 5 lakh from his own savings.
- To save money for his son's higher education—required amount is Rs. 18,00,000 after17 years.
- To save money for his daughter's higher education—required amount is Rs. 20, 00,000 after 21 years.
- To provide for son's marriage after 22 years—expected expenses Rs. 7,00,000 at that time.
- To provide a sum of Rs. 20,00,000 for his daughter's marriage after 24 years.
- To accumulate Rs. 2,00,00,000 at the time of retirement at age 58 for his own retirement planning.

Solution: Let us first make his household budget. His surplus available every month is Rs. 17,000. His salary will also increase by 10% every year.

Contingency Fund His emergency fund is adequate. It is 4.8 months of expenses. He need not provide any more for this.

Insurance Requirement His term insurance policy worth Rs. 30 lakh will be adequate. He may add a critical illness rider and income protection cover to his policy.

Buying a Residential House He plans to purchase a house after 6 years as his wife has now stopped working and payment of EMI may therefore, be difficult. He intends to pay Rs. 5,00,000 towards this and borrow the rest. To accumulate that amount in 6 years, we will recommend that he invest in an equity fund through the mutual fund route. We can expect an average return of 12% p.a. He has to save Rs. 4,776 every month to accumulate Rs. 5,00,000. If we take a rate of 12% p.a. on a housing loan the EMI works out to Rs. 21,803. We have to also consider whether he will be able to pay the EMI at that time. After 6 years, his salary will be Rs. 8,92,867 per annum. If we increase expenses at the rate of inflation of 6%, these will be Rs. 4,25,556 per year and the monthly surplus will be Rs. 38,943.

Providing for Other Goals His first goal is to buy a car after 2 years. For this, he can save Rs. 15,125 every month in a debt fund where we can expect a return of 10% p.a. to accumulate Rs. 4,00,000. His surplus is only Rs. 17,000 per month. If he saves for buying a car first, then he will be saving less for the first two years and after that he has to increase his monthly saving for purchasing a house.

His second goal is to buy a house. If he saves Rs. 15,125 every month to buy a car, only Rs. 1,875 is available for saving for the house. He has to save

Rs. 4,960 per month for 4 years and Rs. 1,875 every month for 6 years so that he can accumulate Rs. 5,00,000 for purchase of a house.

To accumulate Rs. 18,00,000 in 15 years (since the first 2 years' savings will go towards buying a car and partly for a house) for his son's higher education, we recommend that he should invest in equity since the time horizon is long term. If he expects a return of 12% on his equity investment, he will have to save Rs. 3,603 per month.

To accumulate Rs. 20,00,000 in 19 years, he will have to save Rs. 2,308 at a return of 12% p.a. and the goal of his daughter's higher education will be achieved.

To accumulate Rs. 7,00,000 in 20 years at a return of 12% p.a. he will have to invest Rs. 708 per month.

To accumulate a sum of Rs. 20,00,000 in 22 years, he will have to invest Rs. 1,559 per month.

To accumulate Rs. 2 crore in 27 years, he will have to save Rs. 8,290 per month.

The expected return is on a conservative basis; he may get more than this. While making a plan we have assumed rates of return but actual rates may deviate from expected returns. In other words, if we see the performance history of equity investments, it has given a return of more than 12% p.a. He will also get some promotions in this period of time. We also have to review the plan every year and required amendments will be made in the plan.

Estate Planning Estate planning is very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

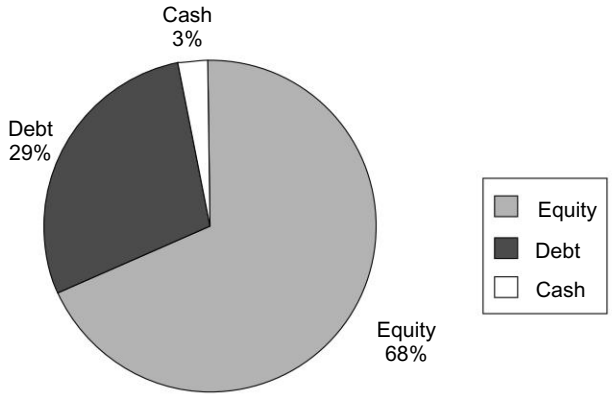

FIGURE 9.13 Required Asset Allocation at His Age

9. Mr. Prakash Singh works with a multinational German company in a senior position. He is 42 years old. He is posted in Delhi and his wife along with their 13-year old son is in Bangalore. She works in a bank and has requested for transfer to Delhi. All the expenses at Bangalore are taken care of by her. Mr. Singh gets a net salary of Rs. 73,000 per month. He is staying in employer provided accommodation.

He has bought a house recently and pays an EMI of Rs. 30,000 per month. His life style is lavish and he spends all his salary after payment of EMI. His wife in Bangalore is also not able to save anything. His total investments are his house and Rs. 2,50,000 in a savings account.

He met a financial planner and discussed his financial situation with him. He wishes to retire at age 55 and life expectancy is assumed to be 75 years.

His financial goals are:

To accumulate Rs. 10,00,000 in 7 years' time for his son's higher education.

To plan for retirement he requires Rs. 1,00,00,000 at age 55 with a time horizon of 13 years for his investments.

Solution: His monthly income is Rs. 73,000 and after payment of EMI the amount available to him is Rs. 43,000.

Contingency Fund The amount of Rs. 2,50,000 in his savings account is sufficient for contingency.

Insurance Requirement He needs a term insurance policy for a sum assured of Rs. 50 lakh.

Buying a Residential House He has already bought a house, which is the only good thing he has done towards his financial well being.

Providing for Other Goals His first goal is to provide a sum of Rs. 10,00,000 in 7 years time. If he invests Rs. 7,653 per month at a return of 12%, he can accumulate the required amount.

To accumulate Rs. 1,00, 00,000 in 13 years at a return of 13% p.a. he will have to save Rs. 24,788 per month, systematically.

He has not saved in any financial asset in all these years, i.e. up to age 42. His goals are not unachievable but he has to cut down on expenses a lot or he may have to work for several years more to sustain a comfortable living standard.

Estate Planning Estate planning is very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

10. Mr. Shah is 75 years old, stays with his son Ashok, and is well looked after. He has a pension income of Rs. 6,000 in the first month after his retirement

at age 60 from government service. He never used that money but invested it in a diversified equity fund for his grandson. He got a 6% increase in his pension every yea which he used. He had other investments also at the time of retirement which are not repurchased by him. The financial assets at the time of retirement were as follows:

	Rs.
Direct equity shares	5,00,000
Balanced funds of MFs	4,00,000
Plot of land	10,00,000

He has approached a financial planner with all the details. His financial goals are:

- To distribute his assets equally among his two grandsons. He expects his life expectancy to be 85 years. He has approached you to calculate the amount that will be available to each of his grandsons.

Solution: Since he is old and his needs are taken care of by his children, all his savings are growing.

Let us first calculate the amount that will be available from his existing investments at age 85.

Rupees 5,00,000 in direct stocks will grow to Rs. 1,64,59,476 in 25 years time (at age 85) if we assume that the rate of return on investments is 15% p.a.

Rupees 4,00,000 will grow to Rs. 43,33,882 in 25 years time if return on balanced funds is 10% p.a.

If we assume that his plot of land grows at a rate of 12% per annum, in 25 years it will be worth Rs. 1,70,00,065.

Rupees 6,000 every month invested for 25 years at a rate of return of 12% will accumulate to Rs. 1,12,73,080.

Total amount available at age 85 will be Rs. 4,90,66,503 which can be distributed among his two grandsons by writing a will.

Estate Planning Estate planning is a very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

11. Mr. A.K. Mehra is 63 years old and retired 3 years ago from a state government job. He has one son and two daughters. All his children are married. Two years before retirement, he purchased a 3 bedroom apartment in Delhi for which his son has taken a loan from his employer. His wife has also taken early retirement from a state government job. Their combined pension is Rs. 18,000 p.m. Both of them got an accumulated amount on their retirement which was used in the marriage of their younger daughter, in paying back the housing loan

of his son and in buying an office. At present he has no other investment other than a residential house and an office. He also has Rs. 78,000 in his savings bank account. He utilizes his office to practice as an insurance advisor and real estate broker. His earning from the consultancy is in the range of Rs. 25,000–30000 p.m. He has to also provide some financial assistance to his younger daughter on a monthly basis. He has not kept a record of his expenses so far; whatever income is generated every month is spent. Now he is a worried man as he is thinking of retiring from his present work after 5 years.

He has approached a financial planner with the following details.

- He wishes to stop working after 5 years from now
- He will have to continue supporting his daughter for the next 5 years (amount required per month is Rs. 10,000)
- He will need Rs. 20,000 every month (after 5 years) at the beginning of every month for the next 20 years, apart from his pension income.

Solution: He is 63 years old and has no liability except to provide a small sum of money each month for his daughter.

Contingency Fund An amount of Rs. 78,000 is in his savings bank account. This amount may be considered adequate since he has a regular flow of income in the form of a pension.

Insurance Requirement A person of age 63 will not require a term insurance policy as he has no dependents. A term insurance policy will also not be available to a person aged 63. He should purchase a medical insurance policy for an adequate amount. Here he can opt for a family floater policy.

Buying a Residential House He is staying in his own flat and the outstanding amount of the housing loan has also been paid back.

Providing for Other Goals He has provided for all the goals except funding for post-retirement years. He needs an amount of Rs. 20,000 every month at the beginning of every month after 5 years, for the next 20 years. This requirement is in addition to the pension income. He has to accumulate money in 5 years.

To withdraw Rs. 20,000 every month at the beginning of every month for 20 years, the savings required are Rs. 22,39,571 if the rate of return on investments is 9% p.a.

To accumulate this in 5 years time, he should invest in a balanced fund where average return can be expected to be 10% p.a. He has to invest Rs. 28,921 per month to accumulate this money.

All his investment is in real estate. He should diversify into equity (small exposure) and debt (more exposure).

His asset allocation should be as indicated in Fig. 9.14.

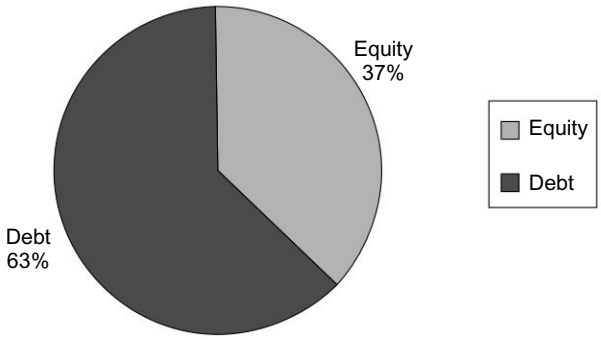

FIGURE 9.14 Recommended Asset Allocation

Estate Planning Estate planning is a very important part of financial planning. Financial Planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

12. Mr. Suresh Oberoi is 28 years old and has recently got married. His wife Sneha works as a junior teacher in a school. She is also pursuing her M.Com. so that she can get a promotion as a senior teacher. Suresh's father expired when he was 7 years old. His mother got a job in his father's place and looked after her children. He has two younger sisters. The elder one is in the final year of her engineering and will be well settled in her job in a year's time. The fee of Rs. 2,00,000 for the last year is due to be paid in a month's time. The younger sister is in class 12 and intends to pursue B.A. (English), M.A. (English) and M.Phil. She wishes to become a lecturer.

He has the responsibility of getting his elder sister married in 3 years time and wishes to spend Rs. 6,00,000 on her marriage. His younger sister will study in a degree college. He will not have to spend a huge amount on her education. The approximate cost per year will be Rs. 72,000 for the next 6 years. On her marriage after 6 years, he wishes to spend Rs. 8,00,000 as the cost will increase over a period of time.

His salary (net of taxes) is Rs. 25,000 p.m. and his wife gets a net salary of Rs. 10,000 per month. They are staying in their own house purchased by his mother. The household expenses are taken care of with the mother's salary. He has to provide for the education and marriage of his two sisters. His present investments are as follows:

Cash at bank	Rs. 2,25,000
Diversified mutual fund schemes	Rs. 3,20,000 (present value) past returns is 15% p.a.
Bank FD for 5 years	Rs. 100000 (purchase price two years ago, interest @ 8% p.a. compounded quarterly)

His bank FD will mature in 3 years. He is staying in his own flat.

He has approached a financial planner to make a plan in such a way that he is able to accumulate the required amount for both his sisters. He will plan for his own future after 6 years. We have to make a financial plan for him which can enable him to achieve his goals.

Solution: He is 28 years old and has recently got married. His wife is also working. His main worry is to accumulate an amount so that he can provide for his elder sister's marriage and younger sister's education as well as marriage.

Contingency Fund He has Rs. 2,25,000 in his savings bank account out of which Rs. 2,00,000 will be used to pay the fee for his sister and Rs. 25,000 is not adequate for any contingency that may arise. He must keep at least 4–6 months expenses in a savings account.

Insurance Requirement If a person buys a term insurance policy, he has to pay a lesser premium. Although a term insurance policy is recommended when a person has dependents and he does not have any dependents at present, he can still purchase a term insurance policy and increase the amount of cover, as dependents arrive. He should also purchase an accident insurance policy and mortgage redemption policy if the house is purchased with a loan amount.

Buying a Residential House They are staying in their own house so at present he has no requirement of buying a house. He can think of doing so at a later stage after providing for the education and marriages of both his sisters.

Providing for Other Goals His first goal is to pay the fee for the final year for his older sister and her marriage after 3 years. Let us first provide for this goal:

- An amount of Rs. 2,25,000 is available in his savings account. He can pay the fee of Rs. 2,00,000 and add more money to his savings account to provide adequately for emergency funding
- He can sell his diversified mutual fund scheme and get Rs. 4,86,680 (assuming a return of 15% p.a.)
- His bank FD will mature after 3 years and he will get Rs. 1,48,595 (compounding is done quarterly)
- Total amount he will get from both these investments will be sufficient to provide for his sister's marriage

His second goal is to provide Rs. 6,000 every month for the education of his younger sister and Rs. 8,00,000 after 6 years for her marriage.

- Rs. 6,000 per month can be provided from his monthly salary.
- To accumulate Rs. 8,00,000 in 6 years, he will have to invest Rs. 7,640.15 per month if return on investments is 12% p.a. This amount can be invested in equity as the time horizon is 6 years and equity gives a return which is much more than the inflation rate.

- The combined monthly income of his and his wife per month is sufficient to accumulate the amount. The remaining surplus from his salary can be invested for their own future in equity and balanced funds. The allocation can be 70 : 30 in equity and debt respectively, after providing for an adequate amount in liquid fund for emergency provisioning.

His present asset allocation is as follows:

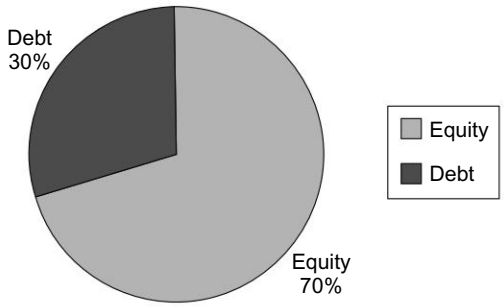

FIGURE 9.15 Present Asset Allocation

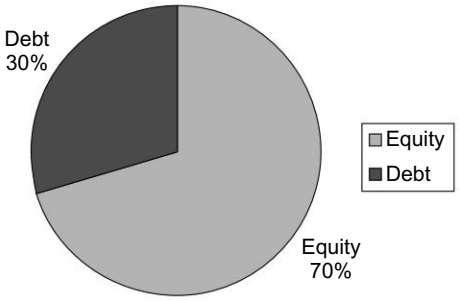

FIGURE 9.16 Revised Asset Allocation

Estate Planning Estate planning is a very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

13. Mr. Chaudhuri is 53 years old and works in a public sector organization as a senior engineer. He gets a monthly salary of Rs. 40,000. His monthly expenses are Rs. 25,000 p.m. He has three children; a son and two daughters. His son Mithilesh works as a research analyst with a college and gets a salary of Rs. 18,000 p.m. (net). He is staying in his own house in Vaishali (Ghaziabad)

His daughter Priti is an engineer and recently got married. He spent Rs. 7,00,000 on her marriage. His second daughter Peemi has recently done M.Com. and is preparing for her M.Phil entrance exams. He will retire after 5 years and will get a pension income of Rs. 15,000 p.m.

His other investments are as follows:

		Present value (Rs.)
1	Shares of ITC	4,50,000
2	Diversified MF (equity) schemes	2,50,000
3	Bank FD (5 years)	1,00,000 (amount invested 4 years back @ 8% p.a.)
4	Savings account balance	80,000

His other assets are a share from 2 flats and one shop in Patna which is ancestral property. The present value of the property is Rs. 70,00,000 and his share will be Rs. 35,00,000 (present value).

His immediate goals are as follows:

- To provide Rs. 10,00,000 for his daughter's marriage after 2 years
- To provide for his son's marriage after 3 years. The expected spending will be Rs. 4,50.000

The share from ancestral property will be available to him only after 5 years when they plan to sell it. He has no worries regarding his own retirement as he will get a regular pension and the amount of PF and gratuity on his retirement can be invested to generate the balance amount required every month.

Make a comprehensive financial plan taking into account all his financial goals.

Solution: He is 53 years old and retiring after 5 years. His savings in financial instruments are not much because he was providing for the education of 3 children and has recently got his daughter married and spent Rs. 7 lakh. He has now to provide for the marriage of two children.

Contingency Fund His savings account has a balance of Rs. 80,000 which is 3.2 months of his expenses. We would suggest that he increases his balance to at least 6–8 months of expenses. He can deposit the required amount either in a flexi-deposit account or money market mutual fund scheme so that he can get a return higher than the savings account rate of interest.

Insurance Requirement His two children are settled and the younger daughter is also on the verge of settling down. He does not require a term insurance policy. At this age either a term insurance policy will not be available or it will be available at a very high premium. He should purchase a medical insurance policy to cover him and his wife for medical expenses.

Buying a Residential House He is staying in his own house. He has ancestral property also which can be sold after retirement and the proceeds can be used partly to buy a pension plan, if the pension income and other benefits are not sufficient to meet monthly expenses after retirement.

Providing for Other Goals His first goal is to provide Rs. 10,00,000 after 2 years for his daughter's marriage. If he invests the surplus amount of Rs. 15,000

every month at a return of 10% he will be able to accumulate Rs. 3,96,703. The remaining amount has to be withdrawn from existing investments to meet this goal.

The bank FD which will mature after one year, should be invested in a Bank FD for another year so that the amount can be used at the time of the marriage. For a horizon of one year it is not advisable to in equity. Debt is the best option for a short term up to 3 years. The remaining amount can be arranged by selling equity shares.

His second goal is to provide for his son's marriage after 3 years, a sum of Rs. 4,50,000. This amount cannot be accumulated in one years' time as the savings for the first two years will be used in the daughter's marriage. He has to pay for the marriage of his son by selling some of his investments. He should plan his redemptions (sale of investment) in such a way that his asset allocation is adequate in equity and debt.

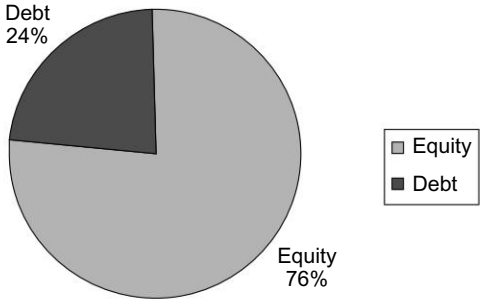

FIGURE 9.17 Present Asset Allocation

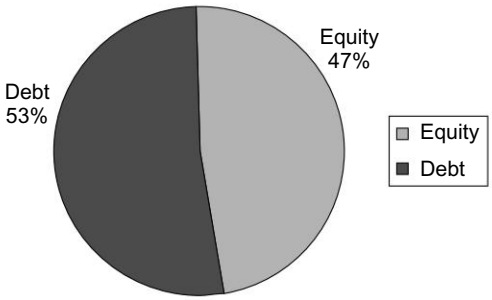

FIGURE 9.18 Required Asset Allocation

Estate Planning Estate planning is a very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

14. Mr. Rehman is 44 years old and is on a project of 5 years in UAE. He started this project a year ago. He gets a salary income of Rs. 16,00,000 p.a. and is able to save Rs. 12,00,000 p.a. He wishes to come back to India after 4 years

and lead a retired life. His family is staying in a big house in Hyderabad. One floor of the house is given on rent and generates an annual income of Rs. 2,40,000. The amount received from rent is sufficient for his wife and 15-year old son.

His existing investments are as follows:

	Rs.
Plot of land in Bangalore	20,00,000 (present value)
Savings account balance	1,40,000
Bank FD @ 9% p.a.	4,00,000 (maturing in 5 year's time)

He has approached a financial planner to provide for the following goals and he is worried about one thing, i.e. can he retire early (at age 48)?

His goals are as follows:

- To provide Rs. 20,00,000 for son's higher education after 3 years
- To provide Rs. 10,00,000 for son's marriage after 10 years
- To accumulate Rs. 50,00,000 for his own retirement after 4 years

Make a Financial Plan taking into consideration all his financial goals.

Solution: He is 44 years old and is on a project to UAE for next 4 years in which he will be saving Rs. 10,00,000 p.a. After that he wishes to come back to India and lead a retired life. The financial planner has to see whether after providing for his son's education and marriage, he will be able to accumulate the required amount for his retirement.

Contingency Fund He has Rs. 1,40,000 in his savings bank account. Looking at his cash inflow, we can say that this amount is sufficient as his contingency fund.

Insurance Requirement He is 44 years old and has two dependents. If we calculate the amount of term insurance required as per the need based method, it is Rs. 38,00,000. At present he has not purchased any term insurance policy. He should buy one for Rs. 38 lakh to protect his family.

Buying a Residential House He has a very big house which is also generating a regular income for his family. If he retires after 4 years from now, he will get a regular income from his house.

Providing for Other Goals:

- His first goal is to provide Rs. 20,00,000 after 3 years for his son's higher education. To accumulate Rs. 20,00,000 he will have to save Rs. 47,868 per month if return on investments is 10% p.a.
- To accumulate Rs. 10,00,000 in 10 years time if the rate of return is 12%, he will have to accumulate money in 4 years till he is working and the accumulated amount will grow for the next 6 years. He will save Rs. 8.275.22 per month (round figure Rs. 8,300) in the next 4 years and this will become Rs. 5,06,631. This amount will grow and the second goal will be achieved.

- His third goal is to accumulate Rs. 50,00,000 in 4 years for his own retirement planning. Out of his monthly surplus of Rs. 1,00,000 he has to invest Rs. 56,143 for the first two goals. For his retirement goal the monthly surplus available is Rs. 43,857. If he saves this money in an investment generating 12% p.a. return, he will be able to accumulate Rs. 26,85,040. His bank FD is also maturing in 5 years and will fetch Rs. 6,24,204. He is still short of his target of meeting the financial goal of accumulating a retirement corpus.
- He has two options, either he can sell his plot of land whenever there is a need or sell the plot now (which would have increased in value) and invest the proceeds in an avenue to generate a regular income for himself. Alternatively, he should work for a few years more.

Estate Planning Estate planning is a very important part of financial planning. Financial planners will advise their clients to write a will so that assets can be distributed to heirs in a smooth manner.

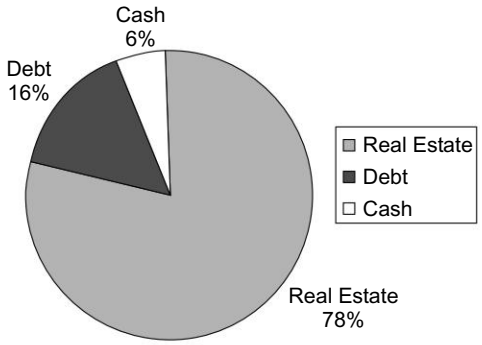

FIGURE 9.19 Current Asset Allocation

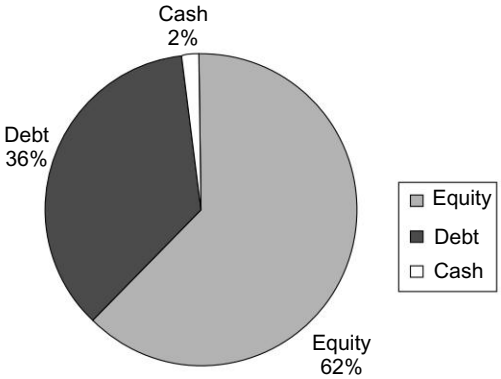

FIGURE 9.20 Required Asset Allocation assuming Plot of Land is Sold

CHAPTER

10

Code of Ethics and Rules of Professional Conduct

LEARNING OBJECTIVES

After studying this chapter you will be able to understand:

- ❑ *The concept of a "Code of Ethics"*
- ❑ *The need to have a code of ethics*
- ❑ *The various codes of ethics to be followed by certified financial planners as set out by the Financial Planning Standards Board, India*

10.1 WHAT IS A CODE OF ETHICS?

Ethics are moral principles. Codes of ethics are general standards which have to be followed by everyone engaged in the same profession and are set out to be uniformly followed by all members. Codes of ethics are different from codes of conduct. A code of conduct is enforceable while codes of ethics are standards which have to be followed voluntarily by members in the interest of their clients as well as in their own interest.

10.2 WHY HAVE A CODE OF ETHICS?

A code of ethics is required:

- To define an acceptable behavior
- To promote high standards of practice

- To provide a benchmark for members to use for self evaluation
- To establish a framework for professional behavior and responsibilities
- As a vehicle for occupational identity
- As a mark of occupational maturity

Ethical principles are mutually beneficial. They help make relationships mutually pleasant and productive. A professional society is a voluntary cooperative organization and those who conform to these rules will benefit from the conformity of other's conformity.

10.3 FPSB, INDIA'S CODE OF ETHICS TO BE FOLLOWED BY FINANCIAL PLANNERS

Financial Planning Standards Board, India has set out a code of ethics and rules of professional conduct which have to be adhered to by all its members in their professional activities and conduct. The Financial Planning Standards Board is a professional body which provides certification to certified financial planners and also takes ownership on behalf of all its members earning Continuing Education Points (CE Points). Earning CE points every year is mandatory so that they can use updated information while making plans for their clients. These rules have been simplified here and are as follows.

BOX

1. Code of Ethics of Integrity
2. Code of Ethics of Objectivity
3. Code of Ethics of Competence
4. Code of Ethics of Fairness
5. Code of Ethics of Confidentiality
6. Code of Ethics of Professionalism
7. Code of Ethics of Diligence
8. Code of Ethics of Compliance

1. Code of Ethics of Integrity

All the members shall observe high standards of honesty in conducting their financial planning business and should give services related to financial planning business honestly.

Rules that Relate to the Code of Ethics of Integrity

- Members shall not give false or misleading advertisements about the size, scope and areas of competence in financial planning of their organization.

- Members should not indulge in materially false and misleading promotional activities via speeches, interviews, books, seminars, radio and television shows.
- Members should not give the impression that they are representing FPSB, India while presenting their views.
- Members should not indulge in any act of dishonesty, deceit or fraud and should not make false statement to clients.
- While exercising custody of client's funds, members should act in accordance with the authority given by the client.
- Members should keep complete records of all the funds belonging to the client and should not co-mingle the client's funds with their own funds.
- Whenever required by the client or his authorized representative, members should render full accounting regarding his funds and should take care of the client's funds like a fiduciary.
- Members shall not make any statement, orally or in writing that misrepresents the services that their company is capable of providing.

2. Code of Ethics of Objectivity

Members shall disclose to the client any limitation on their part to provide financial planning services.

Rules that Relate to the Code of Ethics of Objectivity

- Members shall exercise reasonable and prudent professional judgment in providing financial planning services.
- They should act in the interest of the clients.
- A member shall disclose in writing to the client if he is authorized to sell or advise only on a restricted range of products and any other limitation regarding his capacity to serve the client.
- In providing written financial planning recommendations, a financial planning practitioner shall make timely disclosure of all material information relevant to the professional relationship.
- A detailed statement of compensation disclosing the sources of fee/ commission or any other benefit received/receivable should be fully disclosed.
- A statement stating whether the compensation received by the member will be fee only, commission only or fee and commission should be disclosed. In addition, if the member has any other connection with the product supplier this too should be disclosed.
- A statement of any other conflict of interest should also be disclosed by the member.
- If financial planning services are provided orally, the member should disclose the compensation part to the client orally.

- If conflict of interest arises after the development of a professional relationship, the financial planning practitioner should immediately disclose the conflicts to the client in writing.
- Disclosures regarding compensation should be made annually to ongoing clients.

3. Code of Ethics of Competence

The members shall provide competent financial planning services and maintain the necessary knowledge and skill to continue to do so while providing financial planning advice.

Rules that Relate to the Code of Ethics of Competence

- Members should keep themselves informed of developments in the field of financial planning and participate in continuing education programs throughout the professional career in order to improve professional competence and be in a position to provide quality advice on a regular basis. All members shall satisfy all continuing professional development requirements established by FPSB.
- The members shall offer advice only in those areas where they have competence and they should seek guidance from qualified individuals or refer the clients to them on the areas in which they are not qualified.
- The representatives should be appointed on the basis of reasonable and appropriate standards.

4. Code of Ethics of Fairness

The members shall provide financial planning services in a manner that is fair and reasonable.

Rules that Relate to the Code of Ethics of Fairness

- While providing financial planning services, the member should ensure that prospective clients are clearly informed in writing about the identity of the company providing advice, the nature of services provided and any material information relevant to the professional relationship.
- Information regarding the applicable laws and compliance with the law by the members should also be communicated.
- Clients should also be informed in writing about the internal and external complaint handling system.
- Compensation to be received by the member should be fair and reasonable.
- Before establishing a relationship, the member may provide references which may include recommendations from present or former clients consistent with the confidentiality requirements.

- The member shall clearly disclose to all prospective clients the capacity in which they are able to provide financial planning services.
- A member has to adhere to the same standards of disclosure and service whether he is employed by any financial planning firm or is self employed.
- A member shall advise his employer of any outside affiliations which will compromise service to an employer and give him notice on change of employment.
- A member doing business as a partner or principal of a financial planning firm has to act in good faith with co-partners or co-owners. This includes disclosure of relevant and material information while joining the business and while doing business together. Material information includes information regarding credentials, competence, experience, legal status and financial stability.
- Any member who is a partner or co-owner of a financial planning firm and wishes to withdraw from the firm shall do so in compliance with any applicable agreement and shall deal with business interests in a fair and equitable manner.
- A member shall inform his employer/co-owner/partner if he is going to get any other benefit which is in addition to compensation from the employer/co-owner/co-partner.
- The business transaction entered into with the client should be on fair and reasonable terms.

5. Code of Ethics of Confidentiality

Members shall not disclose any confidential information pertaining to the client without the specific consent of the client and unless compelled to by law or as required to fulfill other legal obligations.

Rules that Relate to the Code of Ethics of Confidentiality

- The members shall not reveal or use for their own benefits without the consent of the client, any personally identifiable information relating to the client relationship except and to the extent that disclosure or use is reasonably necessary. The information can be revealed to establish an advisory account, to effect a transaction for the client, to comply with legal requirements, to defend the member against charges of wrongdoing or in connection with a civil dispute between the member and the client.
- A member shall maintain the same standards of confidentiality to employers as to clients.
- A member who is doing business as a partner or principal of a financial services firm has a responsibility to act in good faith and adhere to reasonable expectations of confidentiality while doing business together and even thereafter.

- Unless compelled by law or to fulfill a legal obligation, any member who as a member of FPSB has access to information concerning FPSB, must keep the information confidential.
- When asked for by the client or any of his authorized representatives about the receipt of any original documents relating to the financial planning advice the member should provide original copies. These do not include file notes or other working documents prepared by the financial planner.

6. Codes of Ethics of Professionalism

The members shall ensure that their conduct does not bring discredit to the financial planning profession.

Rules that Relate to the Code of Ethics of Professionalism

- The members shall show respect for other financial planning professionals and related occupational groups by engaging in fair and honorable competitive practices.
- Members should not engage in any conduct that reflects adversely on their integrity and fitness as a member.
- The members shall engage in business for which they are competent and qualified and certificated as required by law.
- The members shall maintain professional indemnity insurance in accordance with the requirement prescribed by the FPSB from time to time and shall also inform FPSB in writing immediately if there is any material change to their professional indemnity insurance.
- A member shall not misstate his authority to misrepresent FPSB or his status as a member of FPSB. He shall not speak or act in such a manner that another person believes that he is representing FPSB.

7. Code of Ethics of Diligence

The members shall act with due skill, care and diligence in providing financial planning services.

Rules that Relate to the Code of Ethics of Diligence

- The members shall provide services diligently and on a timely basis.
- The financial planning practitioner shall enter into an engagement after securing sufficient information from the client and satisfying himself that the relationship is warranted by the client's needs and objectives and that the practitioner has the ability to provide the requisite competent services.
- In preparing written and oral recommendations to clients, the practitioner shall collect sufficient information to ensure that appropriate advice matching with the needs and objectives can be given.

- While preparing oral or written recommendations to clients, the practitioner shall develop a suitable financial strategy or plan for the client based on the relevant information collected and analyzed.
- The recommendations prepared by the financial planning practitioner shall be understood by the client, i.e. the client should be in a position to comprehend the recommendations, and the risks involved in each investment should be explained to the client.
- All significant recommendations shall be made in writing. If any recommendation is given orally, then the confirmation must be given in writing as soon as practicable.
- Only those recommendations shall be implemented which are suitable for the client and which are agreed upon by the client. They should be implemented in an accurate, efficient and timely manner.
- The client must be warned about the relevant transactions and the consequences of following these prior to implementation.
- A financial planning practitioner shall not advise the client to move from one investment to another investment without explaining the reasons for the move in terms which are easily understood by the client.
- When on the instructions of the client the practitioner has to alter the financial strategy or balance of the existing investments he should confirm all this in writing.
- Where a practitioner has more than one representative, he shall maintain written policies and procedures for the effective control and conduct of the business.

8. Code of Ethics of Compliance

The members must maintain knowledge of and comply with FPSB, India's code of ethics and rules of professional conduct and all applicable laws, rules and regulations of any government, regulatory authority or professional organization governing the member's professional activities.

Rules that Relate to the Code of Ethics of Compliance

- In all professional activities the practitioner shall perform services in accordance with applicable laws, rules, regulations of government agencies and other applicable authorities and rules, and other established policies of FPSB, India.
- In determining whether a member has complied with FPSB, India's professional standards, conduct by its representatives and employees shall be treated as the conduct of the member.
- The member shall use the marks in compliance with the rules of the FPSB, India.

- A member shall cooperate with the FPSB, India in any investigation or compliance review.
- The members must comply with the relevant FPSB disciplinary rules and procedures concerning complaint handling, dispute resolution and disciplinary procedures.
- A member who is an employee in a financial planning firm shall perform professional services with dedication to the lawful objectives of the employer and in accordance with these rules and all laws of India.
- A member shall comply with all the post-certification requirements established by the FPSB, India, e.g. payment of annual membership fees as well as signing and returning the certificate statement annually, in connection with the certificate renewal process.
- All information and relevant documents given to or gathered by the member must be securely stored to establish at any time that it has complied with the FPSB, India's professional standards. Additionally, they should be available for inspection by the FPSB, India and be retained by the practitioner for seven years from the date a document was last acted upon.
- A member should maintain an effective system of supervision of the activities, performance, training and recommendations made to the client of all representatives.

The financial planning recommendations shall be prepared by the practicing financial planner using his professional judgment and giving due respect to the code of ethics and rules of professional conduct as designed by the Financial Planning Standards Board, India, for all its members. These ethics are elucidated so that all the members follow a standard code of conduct. These ethics will set a high standard of behavior for its members.

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