

On the eve of the Economic Reform era, Indian financial market had the following institutions and practices : The money market had a developed treasury bill segment, supported by receivables, promissory notes, trade credit and bills of exchange. The capital market had the following components :

- (i) Development Corporations,
- (ii) Finance Corporations (all India as well as state-centered),
- (iii) Task-specific agencies like the NABARD, and the EXIM Bank and the National Housing Bank,
- (iv) Commercial Banks : A wave of nationalisation, starting with the nationalisation of the Imperial Bank of India and its conversion into the State Bank of India in 1955, and ending with the nationalisation of 20 important private sector banks by 1980, changed the very profile of the banking system as the banks now had to lend to small industry and agriculture as well, instead of being confined to large industry lending for working capital. Banks could now not only grant term loans but also undertake non-traditional activities like merchant banking and operating mutual funds. Bank branches reached semi-urban and rural areas as well. By 1990, such branches totalled slightly more than 60,000.
- (v) Cooperative Banks : Up to independence the cooperative credit system was practically a flop. But by 1990 their contribution to rural credit increased perceptibly.
- (vi) Regional Rural Banks : Several such banks came to be set up in different parts of India, being sponsored by public sector banks, for granting all kinds of credit to small farmers, farm labourers, artisans and small entrepreneurs in rural areas.
- (vii) Non-banking Finance Companies (NBFCs) : By 1990 these agencies became an important player in India's financial market (initially belonging to the old fashioned market), accepting deposits at high rates of interest and rendering all sorts of financial help to relatively small businesses.
- (viii) Venture Capital Funds,
- (ix) Mutual Funds (the Unit Trust of India, government-owned, was the major MF in India by 1990),
- (x) Merchant Banking institutions for facilitating the issue business,
- (xi) A rating agency to help lenders to differentiate between high risk and low-risk companies,

- (xii) While the controller of Capital Issues was doing its duty as well by examining all applications for raising capital in the new issue market,
- (xiii) The postal savings banks,
- (xiv) The Reserve Bank of India, nationalised in 1947, charged with the twin duties of promotion and regulation,
- (xv) All insurance firms nationalised and transferred to State-owned Life Insurance Corporation of India and the General Insurance Corporation of India,
- (xvi) Provident and Pension Funds. As a result of these developments dependence upon old fashioned market came down perceptibly.

But with the launching of a new Industrial Policy in 1991, aiming at liberalisation, privatisation and globalisation, the entire scenario underwent a sea change. For supporting this new policy a package of financial measures, many arising from the Report (1991) of the Narashimham Committee, had to be implemented. The financial sector reform resulted in considerable freedom for market players. Private players were allowed entry into banking, insurance and mutual fund business, foreign institutional investors were allowed to invest in Indian securities, Indian companies were allowed to raise funds in foreign countries, and strict foreign exchange control was abolished, replaced by a more liberal Act. Banks have been permitted to foray into universal banking. New private banks, including foreign ones, have appeared. In fact, now any financial agency can deliver any financial product. Competition and technology upgradation has resulted in a vast improvement in the quality of service rendered by banks as also security market agencies. While both the primary issue and secondary stock markets have been made free from excessive bureaucratic control, attention has been given to the security of savers and investors through proper disclosure and behavioural norms, enforced not by the controller of Capital Issues (which was abolished) but by the newly set up Securities and Exchange Board of India (1992). All players of the security market were brought under the regulatory authority of the SEBI. The development finance institutions have been living the arena one after another. For helping financial institutions in recovering their unrecovered loans the SARFAECI Act was passed in 2002. A new financial instrument, called the derivative, has been introduced. In the insurance field an Insurance Regulatory and Development Authority has been set up. The era of state ownership and state direction in the financial system has been gradually coming to an end as a sequel to financial reforms. The dependence upon money lenders has been minimised at the same time.

1.5 Appendix

Highlights of the Recommendations of the Narasimham Committee (1991) to review Indian Financial System. Reference : Datt and Sundharam, Indian Economy (2004).

In August 1991, the Government of India appointed a committee to review the financial system under the Chairmanship of Sri M. Narasimham, former Governor of the Reserve Bank of India to examine all aspects relating to the structure, organization and functioning of the financial system. The Committee's report was tabled in Parliament on December 17, 1991. It was in keeping with the new Industrial Policy of 1991 which aimed at liberalisation, privatisation and globalisation of the economy through time, freeing it from excessive state control and state domination, a sequel to the Industrial Policy of 1956. The main recommendations of the committee were the following :

- * Phased reduction of Statutory Liquid Ratio (SLR) to 25% over a period of five years for banks.
- * Progressive reduction in Cash Reserve Ratio (CRR) of banks.
- * Phasing out of directed credit programmes and redefinition of the priority sector.
- * Deregulation of interest rates so as to reflect emerging market conditions.
- * Stipulation of minimum capital adequacy ratio of 4% to risk weighted assets by March 1993, 8% by March 1996, 8% by those banks having international operations by March 1994.
- * Adoption of uniform accounting practices in regard to income recognition, asset classification and provisioning against bad and doubtful debts (Non-performing Assets).
- * Imparting transparency to bank balance sheets and making full disclosures.
- * Setting up of special tribunals to speed up the process of recovery of loans.
- * Setting up of Assets Reconstruction Fund (ARF) to takeover from banks a portion of the bad and doubtful advances at a discount.
- * Restructuring of the Banking System so as to have three or four large banks which could become international in character, 8 to 10 national banks and local banks confined specific regions and rural banks including RRBs confined to rural areas.

- * Setting up one or more rural banking subsidiaries by public sector banks.
- * Permitting RRBs to engage in all types of banking business.
- * Abolition of branch licensing.
- * Liberalizing the policy with regard to allowing foreign banks to open offices in India.
- * Rationalization of foreign operations of Indian Banks.
- * Giving freedom to individual banks to recruit officers.
- * Inspection by supervisory authorities based essentially on the internal audit and inspected reports.
- * Ending duality of control over banking system.
- * A separate authority for supervision of banks and financial institutions which would be semi-autonomous body under RBI.
- * Segregation of direct lending functions IDBI to a separate institution.
- * Obtaining resources from the market on competitive terms by DFIS.
- * Speedy liberalization of capital market by removing restrictions on the premium dispensable with prior Government approval, etc.
- * Supervision by separate agent to be setup by RBI and enactment of separate legislation providing appropriate framework for mutual funds and laying down prudential norms for institutions.

Unit 2 □ Role and Importance of Financial Management

Structure

- 2.1 Introduction**
- 2.2 The Finance Function**
- 2.3 The Finance Discipline**
- 2.4 Questions**
- 2.5 Reference**

2.1 Introduction

Traditionally the goal of financial management is to minimise the cost of procuring finance and maximise the gain from the use of finance.

Initially it was a period of time when people used to consider accounts as finance alone. With the progress of time the concept has undergone significant change as accounting has been tamed to its logical position of working for finance as a part of it. That Financial Management has not received its full share of concern of the professionals throughout the world can be inferred from the number of publications, research papers and documents that keep emerging on. While the traditional approach of financial management was based on the single principle of minimization of cost in the procurement of funds and optimum use of such funds, the later developments, particularly those after the Second World War are focused more on certain other areas such as :

- a) Investment decisions,
- b) Financing decisions and
- c) Dividend decisions.

The need for an inclusive treatment of those finance functions being incontestable, the eagerness of these professionals for spreading their knowledge in these fields has tended to push the other critical function of finance, the management of working capital, to the back seat. Obviously, certain actions like expansion, reorganization, merger, acquisition, modernization and allied organic growth, require amounts of fund from outside. Decision making on procurement of funds then becomes a very much important issue.

When there is a demand in the market in terms of procurement of funds, suppliers of fund rush in. Then it becomes a matter of making a choice among available alternatives to make an investment. It may be the other way round also. With progress of technology and horizontal integration of markets, the options before the investors began to increase, leading to the importance of investment decisions. Again, for various reasons including increase in demand, newer opportunities having been available in the market, the question of financing began to haunt the minds of the professionals. This, coupled with the internal demand for financing various items and activities, the emphasis on financing became obvious. Further, with the onset of market economy the importance of securities market has been felt by everybody. While the price movement of a scrip is seen by many as reactions to the conditions or health of the company, the questions of valuations of the scrip have been attempted to be resolved by many through the dividend decisions of the related company. Dividend decisions have become all important in the context of the changed ownership patterns. If the company is unable to maintain a high share price in the market through appropriate dividend decisions and related actions, then the act of the managers of the company goes against the interests of the shareholders, leading to a shakeup in the ownership patterns.

The above discussion shows the importance of investment decisions, financing decisions and dividend decisions. But, in the process, we tend to ignore the quality of actions taken in day-to-day functioning of the company. It is this day to day functioning of the company in the field of finance that is called the working capital management. In intrinsic sense, working capital should include all sorts of fund nurtured and garnered by the company at any point of time. That means the portion of long term finance with which current work is being run, the intrinsic fund for normal day to day functions as well as the potential activities arising out as effects of the today functions initiated as causes now are all to be clubbed under working capital. In fact, nearly fifty percent of the job-hours of finance professionals are invested in managing working capital. If we consider the finance functions as such, the total job-hours in an organization invested usually in managing the working capital is roughly sixty to seventy percent in most of the organizations. Time wise, working capital management consumes most of these as compared to other areas of financial management.

Let us look into the functions of finance with a focus on the roles desired of it.

Ordinarily, the desired role of finance is to fulfill the objectives set by the proprietor's and entrepreneurs of the enterprise. The single objective of shareholder's

'wealth maximization' cascades down to the level of the agents (managers and professionals who run the show) of the company as the twin objectives of

1. Wealth maximization and
2. Profit maximization

In order that the wealth or value of the company is maximized, we have to take care of the effect of time on value. An amount of Rs. 100 accruing after a period of one year does not carry the same value as the same amount accruing in the current period. This shows that wealth has to be measured in terms of the time value of money. The present value of future potentials, that is, the present value of the stream of net income that the scrip is going to generate in the future period is to be considered as the worth of the company as sensed and estimated by the holders of a scrip of the company. This shows that there should be discrimination between financial actions that are going to generate positive cash flows (Income over incipient or incurred costs). A financial action that has got the potentials of generating positive net present value is accepted only. In case of alternatives available in a particular financial initiative, the one with the best possible gains in terms of net present value is considered for acceptance.

Between two mutually alternative projects, having the same amount of initial investments, same time span estimated for completion, belonging to the same industry category and operating at the same level of technology, the question of short term management of fund becomes most important and instrumental in getting positive net present values. Let us take an example : EI. 1

Mishra Ltd. is a diversified industrial house. Its finance professionals are currently evaluating investment proposals submitted by two different divisions.

The Personal Computer division has put forward a proposal to produce a new version of the PC-excel which is expected to have a four years of life (because of the rapid changes in the field of computers and electronics, the life expectancy is short). But the project would require one year time to get the production facilities set properly.

The manufacturing division, which wants to have a new facility to manufacture the latest version of textile machine with computerized operation system, would require the same amount of investment and the life expectancy is five years.

The finance division in its efforts to evaluate these two projects gets the following cash flow estimations furnished by the departments :

| Year | PC Division | Manufacturing Division |
|------|-------------|------------------------|
| 0 | -1000* | -200* |
| 1 | -1000* | +400 |
| 2 | +00 | +450 |
| 3 | +900 | +1000 |
| 4 | +900 | +1000 |
| 5 | +900 | +750 |

(* Initial investment, ** Additional investment required to finish the project)

Now the finance department has to procure Rs. 2000m for either of these projects and the amount is supposed to be returned by both the PC Division as well as the manufacturing divisions more than squarely. If the finance division calculates the outcome based on the 'pay back period' —that is the period of time in which the initial investment is returned it finds that for the two projects these periods are :

Pay back period for PC Division = 3 years 2 months and 2 days and Pay back period for Manufacturing Division = 3 years one month 24 days.

That means the two projects promise pay back in almost the same period of time with a difference of almost one month between them. Promises made by the projects would become futile if there is any lack of efforts in the short term management. For example, in the PC Division, let us say, the components would come from USA and that, faced with problems of the like of the Gulf war, there is a delay in supplies by six months. This means that for components, either in the years, of commissioning or in the subsequent year the gap of six months results in the accruing of funds by the same time. So, for the PC Division, at the commissioning stage it costs the company Rs. 1000m multiplied by half of the annual rate of interest at which the company had procured the fund. The second effect is the extension of project life from 3 years 2 months and 20 days to 3 years 8 months and 2 days. That means again, that a viable project would lose its intrinsic viability.

The firm may take an alternative stand if it can foresee the problem in obtaining components from overseas. It may go for maintaining a buffer stock of the component as a measure of safeguarding against the fluctuating impacts of the supplies. This again is a costly proposal, as the investment which could be made after a while was likely to be made a point much early for which the company would require additional amount of fund.

Further, this shows that investment decisions cannot remain indifferent to the short term aspects of managing finance which contributes to the optimum policy decision or final judgement. An investment decision can produce good results only if it stems from a proper management of working capital.

Then, the question of examining the role of working capital management in financing decisions arises. In corporate financing, we examine various mixes or combinations of alternatives. There can be internal source of financing-financing through ploughing back of profit into the business. The second option could be to issue common stock for a long term spectrum. The third option could be to get debt through long term or flexible bond issues or getting finance from the financial institutions. The issue could be viewed as a problem, analyzing and working out trade-off between two or among many alternatives. Some of the issues that confront business firms are :

- Should the firm plough back most of its earnings in the business, or should it pay them out as dividends ?
- In case additional investment is required, should the firm finance it through issue of shares or it should borrow ?
- In case it decides to borrow funds from external sources, should it borrow for a short-term or for a long term ?
- Instead of borrowing the required amount of funds from the financial institutions, should it borrow from the common investors by issuing bonds ? If so, should it issue long term bonds and come under a long term commitment or should it issue a flexi bond wherein the investors feel more freedom to choose among alternatives ?

There are a number of other issues, or trade-offs, that come up in the process of financing of a project or of a scheme.

Let us now examine these financing decisions in the light of the short term management of finance. In the example of **Mishra Ltd.** (EI-1) we find both the PC division and the manufacturing division wants Rs. 2000m as an immediate financing need. In a market where corporate taxation is present dividend against the shares is costlier than the interest payments against bonds or loans taken from financial institutions. If the interest rate is 10 percent per year for a period of 10 years, on a float rate, the total sum of interest will be the amount equal to the original investment of Rs. 2000m.

However, this whole amount is deducted from the revenues earned by the company in the corresponding years to arrive at a new profit. Tax is charged on this net profit to get the after tax profit which is the fund available for the shareholders. In the absence of any decision to plough back this fund as 'Reserve and Surplus' by keeping them, the whole amount is supposed to be distributed to the shareholders. If the shareholders also expect a 10 percent dividend on the investment, and if an amount equal to the amount of interest paid in the former case is accrued, then burden on the company's revenue is $1/(1 - t)$ times the amount of dividend, where 't' is the tax rate applied to the enterprise at that point.

Now the question is, how much surplus or profit the organization is supposed to earn in order to make either of the above mentioned plans to succeed? It is again the function of the short term management of finance that is instrumental in finalizing that. For example, in the case of Mishra Ltd. if unrealized sales are abnormally high, say 50 percent of sales and the total expenditure is at 75 percent level of total sales, then the company will enjoy a book profit of 25 percent but at the same time suffer an amount of cash deficit of 25 percent of sales. The unrealized amount of sales is termed in accounting parlance as 'Sundry Debtors'. It is one of the major components of the working capital of the firm. While case is flowing in the arteries and veins of the organization, it gets converted into items of sales and then through sales it is returned either as cash or as sundry debtors. It is a matter of fact that unless the company gets a good management for its working capital, even a impressive sales volume and value could result in an actual or cash loss for the company. But the book profit would invite taxation and then paying dividend from the residual 'after tax profit' might prove fatal to the company. The other side of the problem is, unless there is a legacy and inherent indication about a good dividend, the company will lose financing options. This is again true in the case of getting fund through bond issues as well as through direct loans obtained from the financial institutions. In both the cases, the ultimate measure is the actual net inflow of cash (cash inflow in excess of cash outflow) for the period under consideration.

The above analysis establishes that whatever be the financing decision of the company, unless there is an efficient management of the short term finance, namely, the working capital management of the firm, no financing decision can attract funds from potential sources.

Finally, coming to the dividend decision, we find that dividend is a function of cash profit which the company is able to generate. Again, as we have already

discussed, earning profit is a function of short term management of finance. This could be achieved in two ways :

- Through minimization of cost and
- Maximization of sales volume and values.

Cost minimization is again a function of short term financial management. Rationalizing liabilities in the short term period is one of the most important items. Short term liability can be considered as the book source of short term finance, till it crystallizes. The moment it is paid, the accrual dissolves and the book-finance turns into costs for the period under consideration. This is how management of short term liability can be instrumental in maximizing profit.

The other option is the most positive, namely, through increase of sales in real terms. This means having earned an amount of sales is not enough; the amount has to be realized in essential term also. In both respects, it turns into the questions and what about of the short term management of fund.

2.2 The Finance Function

Thus, the objective of the finance function of a manager may be set out in different ways. He may aim at optimising the value of his assets or minimizing the worth of his liabilities. Put in differently, he may maximise his gross (or net) profits, or aim at optimising the market value of his company's shares. Looked at from any angle, the management basically aims at economy, efficiency and productivity leading to high profits. For this purpose he concentrates on the efficient management of cash and credit so far as the financial aspect is concerned. In raising funds and in using funds the costs of alternative sources and uses of funds have to be considered. Given a particular use of funds, the cost-minimizing mix of sources of funds has to be found out.

2.3 The Finance Discipline

The study of finance is the study of the sources and uses of finance. Finance as a discipline has been honored as one of the most important areas in the body of learning and practice throughout the ages. It is not because of the rapid marketisation as a result of globalization, that the importance of finance over others has galloped, but it has enjoyed the same importance during Roman, Byzantine, Early Christian as

well as the ancient Indian civilizations. In the Kautilyan framework the importance of finance was highlighted. The Delphi of Greece, the Oracle known for its prophecy and certification, has not only conferred the highest honor to Socrates, calling him the 'Wisest man', but also honored a few other people including a treasury manager as 'wise'. In the modern world, management, as a full grown discipline of learning, has been recognized only by those involved in the process of its inculcation, in the profession of those aspiring for the associations. 'Management' education was gaining importance throughout this century more or less as a sure shot for entry into a bread earning profession without being able to approbation from person in other full grown disciplines like science, philosophy, literature. This lacuna has been offset by two giant finance theorists, Professors Harry Markowitz and William F. Sharpe through their winning Noble Prize for the theory of the Capital Asset Pricing Model (CAPM) structure and market. Finance has been given the berth on a par with physics, philosophy, literature, economic etc., and has been recognized for perpetual utility in the matters of mankind.

Profession of finance requires quantitative skill of science as well as initiative skill of humanities. A good mix of these two can help fetch results in finance. Academic excellence is not always considered as a prelude to achieving success in business. Augmented excellence at the superficial, behavioral level is given more weightage in most of the cases. Communication and presentation skills, sometimes, overshadow the core excellence even at the centers of learning. This has been a post second world war development. Forced by the first (73-74) and second (78-79) oil shocks, the global business community identified the process of globalization as more profitable to them compared to the regime of bilateral or multilateral pacts. In their efforts to globalize business, the initial bias was in favor of augmented qualities. This mindset has changed a lot in the systems and patterns. But substantial knowledge of the core discipline and not the facial makeup by communication and presentation skill is being increasingly felt now as the necessity of the modern times. The trouble of learning concept through it own natural war has to be undertaken in order to learn the subject properly. Otherwise the same breed of hollow mask holders of knowledge would abound the organizations and face recoil through rejection after a period of tests in the actual field of work.

If one wants to learn physics with a view to contributing something or do something worthy, one has to take the pains to learn the existing theories in their natural format. The process of arriving at those theories as well as the dynamics of possible events or related outcomes has to be studied. W. Heisenberg, the great

physicist had written in his famous work, *Physics and Philosophy* about using mathematical formula as, “the description in plain language will be a criterion of the degree of understanding that has been reached”. It is true of analyze of cases, events and future outcomes in subjective terms. Look at the Heisenberg’s uncertainty principle and guess whether it would have been possible for him to even think in terms of reaching at the principle without making enormous amount of mathematical exercises which he did. This is simply not possible. The learning process should be as rigorous as possible involving the available mathematical and other critical tools (if any). But when one equipped with all this tools makes an analysis for general class of people, he should not complicate knowledge but be able to explain it in simple terms.

Among the major management disciplines, finance is one that involves intricate and rigorous mathematical models and steps. A tendency to avoid those aspects of the subject world turn the learner into a hollow person may be with masks to win in the shorter period, but only to invite damage and disaster in the long term.

2.5 Questions

1. Discuss the issues involved in modern financial management.
2. Examine the status of Finance as a discipline.
3. What are the qualities which the profession of finance requires?

Objective Type

1. A good manager (a) must know finance, (b) need not know finance, (c) need know only finance.
Tik the correct answer.

Short answer type

1. How would a manager raise funds for business expansion in a regime of low interest rates?
2. How should a manager raise funds in a regime of high profit expectations?

2.4 Reference

Kuchhal S. C., *Corporation Finance* (2002), Chaitanya Publishing House, Allahabad.

Unit 3 □ Mutual Funds : Types, Performance and their Measurements

Structure

- 3.1 Introduction**
- 3.2 What is a Mutual Fund (MF) ?**
- 3.3 Common Rules for Mutual Funds**
- 3.4 Regulation of Mutual Funds**
- 3.5 Latest Trends**
- 3.6 Annexure I**
- 3.7 Questions**
- 3.8 Reference**

3.1 Introduction

In India mutual funds (MFs) appeared in the 1960s to make portfolio investment safer and easier for the individual investor. The appearance of these funds has acted as a booster for the secondary market in securities. As MFs are organised as trusts, they are also called investment trusts. The industry has grown in size by about 200% between 1993–2003, as reported by the Financial Express on 25.07.2004. It is regulated by the Securities and Exchange Board of India.

3.2 What is a Mutual Fund (MF) ?

An MF is a type of investment agency which issue scrips, known as units to the investors, known as unit holders and invests their money in different kinds of equity and debt securities, and asks the unit holders to share the profits or losses there from in accordance with the quantum of money invested by unit holders. Thus, a unit represents a mixture of different securities.

History of the Indian Mutual Fund Industry :

The mutual fund industry in India started in early 1960s with the formation of Unit Trust of India, at the initiative of the Government of India and Reserve Bank. The history of mutual funds in India can be broadly divided into four distinct phases.

Phase-1 : 1964-87

Unit Trust of India (UTI) was established on 1963 by an Act of Parliament. It was set up by the Reserve Bank of India and functioned under the Regulatory and administrative control of the Reserve Bank of India. It was a state-owned institution. In 1978 UTI was de-linked from the RBI and the Industrial Development Bank of India (IDBI) took over the regulatory and administrative control in place of RBI. The first scheme launched by UTI was Unit Scheme 1964. At the end of 1988 UTI had Rs. 6,700 crores of assets under management.

Phase-2 : 1987-1993 (Entry of Public Sector Funds)

1987 marked the entry of other, public sector mutual funds set up by public sector banks and Life Insurance Corporation of India (LIC) and General Insurance Corporation of India (GIC). SBI Mutual Fund was the first non-UTI Mutual Fund established in June 1987 followed by Canbank Mutual Fund (Dec., 87), Punjab National Bank Mutual Fund (Aug., 89), Indian Bank Mutual Fund (Nov., 89), Bank of India (June, 90), Bank of Baroda Mutual Fund (Oct., 92). LIC established its mutual fund in June 1989 while GIC had set up its mutual fund in December 1990.

At the end of 1993, the mutual fund industry had assets under management of Rs. 47,004 crores.

Phase-3 : 1993-2003 (Entry of Private Sector Funds)

With the entry of private sector funds in 1993, a new era started in the Indian mutual fund industry, giving the Indian investors a wider choice of fund families. Also, 1993 was the year in which the first Mutual Fund Regulations came into being, under which all mutual funds, except UTI, were to be registered and governed. The erstwhile Kothari Pioneer (now merged with Franklin Templeton) was the first private sector mutual fund registered in July 1993. With the establishment of the SEBI, the industry came under its regulation.

The 1993 SEBI (Mutual Fund) Regulations were substituted by a more comprehensive and revised Mutual Fund Regulations in 1996. The industry now functions under the SEBI (Mutual Fund) Regulations 1996.

The number of mutual fund houses went on increasing, with many foreign mutual funds setting up funds in India, and also the industry has witnessed several mergers and acquisitions. As at the end of January 2003, there were 33 mutual funds with total assets of Rs. 1,21,805 crores. The Unit Trust of India with Rs. 44,541 crores of assets under management was way ahead of other mutual funds.

Phase-4 : since February 2003

In February 2003, following the repeal of the Unit Trust of India Act 1963 UTI was bifurcated into two separate entities. One is the Specified Undertaking of the Unit Trust of India with assets under management of Rs. 29,835 crores as at the end of January 2003, representing broadly, the assets of US 64 scheme, assured return and certain other schemes. The Specified Undertaking of Unit Trust of India, functioning under an administrator and under the rules framed by Government of India and does not come under the purview of the Mutual Fund Regulations.

The second is the UTI Mutual Fund Ltd., sponsored by SBI, PNB, BOB and LIC. It is registered with SEBI and functions under the Mutual Fund Regulations. With the bifurcation of the erstwhile UTI which had in March 2000 more than Rs. 76,000 crores of assets under management and with the setting up of a UTI Mutual Fund, conforming to the SEBI Mutual Fund Regulations, and with recent mergers taking place among different private sector funds, the mutual fund industry has entered its current phase of consolidation and growth.

Erstwhile UTI was bifurcated into UTI Mutual Fund and the Specified Undertaking of the Unit Trust of India effective from February 2003. The Assets under management of the Specified Undertaking of the Unit Trust of India has therefore been excluded from the total assets of the industry as a whole from February 2003 onwards. At present about 7% of the household savings is kept in MF assets. By 2003, 1457 schemes had been offered by 31 MFs in India. Through merges and acquisitions the number of MFs came down to 29 by September, 2004.

What are the benefits of investing in a mutual fund ? Or, Why shall I invest in a mutual fund ?

I shall invest in a mutual fund because of the rationale behind it.

Rationale behind investing in Mutual Funds :

The advantages of investing in Mutual Funds are :

- Management by Experts
- Diversification and Risk Reduction
- Good Administration
- Earning Potential
- Cost Advantage
- Liquidity
- Transparency

- Flexibility
- Multiplicity of schemes
- Regulations
- Tax Benefits

Management by Experts :

Investors can avail of the services of experienced and skilled professionals who are backed by a dedicated investment research team which analyses the performance and prospects of companies and selects the suitable investments to achieve the objective of the Mutual Fund scheme.

Diversification :

Mutual Funds invest in a number of companies across a broad cross-section of industries and sectors. This diversification reduces the risk because seldom do all stocks decline in the same time and in same proportion. Investors can achieve this diversification through a Mutual Fund with far less money than they can do on their own portfolio investment.

Good Administration :

Investing in a Mutual Fund reduces paper work and helps to avoid many problems such as bad deliveries, delayed payments and unnecessary follow up with brokers and companies. Mutual Fund saves investor's time and makes investing easy and convenient.

Earning 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.

Cost Advantage :

Mutual Funds are a relatively less expensive way to invest compared to directly investing in the capital markets because their benefits of scale in brokerage, custodial and other fees translate into lower costs for investors.

Liquidity :

In open-ended schemes, investors can get your money back promptly at net asset value related prices from the Mutual Fund itself. With close-ended schemes, the investor can sell her/his units on a stock exchange at a prevailing market price or avail of the facility of direct repurchase which some close-ended and interval schemes offer periodically.

Transparency :

Investors get regular information on the value of investment in addition to disclosure on the specific investments made by the scheme, the proportion invested in each type of security and the fund manager's investment strategy and outlook.

Flexibility :

Through features such as regular investment plans, regular withdrawal plans and dividend reinvestment plans, investor can systematically invest or withdraw funds according to their needs and convenience.

Multiplicity of Schemes :

Mutual Funds offer a variety to enable investors to take advantage of opportunities not only in the equity, debt and money markets but also in specific industries and sectors.

Regulations :

All Mutual Funds are registered with SEBI, in India 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.

What are the types of Mutual Funds Schemes ?

Types fo Mutual Fund Schemes :

Broadly speaking MF schemes are either debt-oriented (low risk) or equity oriented. In India about 80% of the schemes are debt-oriented.

- By Structure : Open-ended; Close-ended and Interval schemes.
- By Investment Objective : Growth Scheme; Income Scheme; Balanced Scheme and Money Market Schemes.
- Other Schemes : Tax Savings; Index Schemes and Sector-Specific Schemes.

Open-ended schemes are open for subscription the whole year. They do not have a fixed maturity. One can buy and sell your units at the NAV related prices to the Mutual funds.

Close-ended schemes can be subscribed to, only during the initial public offer and thereafter one can buy and sell the units of the scheme on the stock exchange where they are listed. They have a stipulated Maturity period the duration of which is generally 2 to 15 years. They are usually traded at a discount to the NAV.

Growth Schemes : In such schemes, investment is made in equities and convertible debentures. The objective of these schemes is to provide capital appreciation over a period of time. The dividend may or may not be declared.

Debt/Income Funds : These are funds that invest predominantly in income bearing instruments like bonds, debentures, government securities, commercial paper etc. Income bearing instruments are much less volatile, although they do carry credit risk. The objective of these schemes is to provide a regular and steady income to the investors.

Balanced Funds : Such funds invest both in equity shares and income-bearing instruments in the proportion indicated in their offer document. The objective is to provide both growth and income by periodically distributing a part of the income and capital gains they earn.

Money Market Schemes : These schemes invest in Zero risk or safer, short term instruments like treasury bills, certificates of deposit, Commercial Paper and inter-bank call money. The objective of these schemes is to provide liquidity and moderate income and also preserve the capital.

Equity Linked Saving Schemes (ELSS) : These schemes are open-ended growth schemes with a mandatory 3-year lock-in. These schemes offer the benefit of section 88 of IT Act, up to a maximum of Rs. 10,000 (tax saving of 20% of 10,000 which is Rs. 2000). Main features of ELSS are—

- (a) *Repurchase* : Repurchases are permitted after a period of 3 years.
- (b) *Lock-in-period* : The units under ELSS are prohibited from trading, pledging and transfer during the lock in period of 3 years.

Lastly we have Specialty Schemes to cater to the investment objectives not covered by the other schemes :

Index Schemes

Sector Schemes

- Index schemes replicate the performance of the stock Index such as BSE SENSEX or NSE 500.
- Sectoral schemes are specialty mutual funds that invest in stocks that fall into a certain sector of the economy. Here the portfolio is dispersed or spread across the stocks of a particular sector.

What is the difference between open ended and close ended schemes ?

Open-ended funds do not have a fixed maturity whereas close-ended schemes have a stipulated maturity period. New investors can join the scheme by directly applying to the mutual fund at applicable Net Asset Value related prices in case of open-ended schemes whereas in case of close-ended schemes new investors can buy the units from secondary market only. This results in the unit capital of open ended schemes fluctuating daily unlike the close ended scheme where it remains constant.

What are sector funds ?

These are specialty mutual funds that invest in stocks of certain sectors of the economy. Here the portfolio is dispersed or spread across the stocks in a particular sector. This type of scheme is ideal for the investor who has already made up his mind to confine his risk and return to one particular sector. Thus, a fund may invest in companies that manufacture fast moving consumer goods or computers.

How is investment in a Mutual Fund different from a Bank Deposit ?

When you deposit money with the bank, the bank promises to pay you a certain rate of interest for the period you specify. On the date of maturity, the bank is supposed to return the principal amount and interest to you. Whereas, in a mutual fund, the money you invest, is in turn invested by the manager, on your behalf, as per the investment strategy specified for the scheme. The profit, if any, less expenses of the manager, is reflected in the NAV or distributed as income. Likewise, loss, if any, with the expenses, is to borne by you.

How are mutual funds different from Portfolio Management Schemes ?

In Mutual Funds, the investments of investors are pooled to form a common corpus and the gain/loss to all investors during a given period are same for all investors, whereas in the case of portfolio management scheme, the investment of a particular investor remains identifiable to him. Here the gain or loss of all the investors will be different from each other.

What is NAV and how is it calculated ?

Net Asset Value is the actual value of units of the scheme on a given business day. NAV reflects the market value of the fund's investments on that day after accounting for all the expenses.

Unit Trust of India

UTI was set up with a view to attract the savings of small man and deploy the funds for growth. Initially offers for attractive return and growth to the investors were given while minimizing the risk element for individual investors.

The Unit Trust of India Act, 1963, under which UTI was constituted, did not initially permit it to take up activities other than dealing in “units” defined under the Act. Later on the restrictions were removed. UTI has been permitted to take up other activities as direct lending of funds, all rediscounting, leasing, financing of housing projects, and hire-purchase financing and to set up subsidiaries for many financial services and banking, and underwriting corporate securities.

The growth in the business of UTI, especially during the eighties, has been spectacular. The gross sales of units (under all schemes) which has amounted to Rs. 10 crores in the first year, i.e. in 1964–65, recorded a rapid growth, especially since 1982–83 and rose to Rs. 3,701 crores in 1988–89, and further to Rs. 4,122 crores in 1990–91. UTI along with all its funds have a total investible funds of about Rs. 70,000 crores, at end March 2002, with more than 70 schemes.

UTI Schemes for Resident Indians

The UTI offers a variety of investment schemes (funds) to the investing public. As of day, it has, in all, six open ended investment schemes, viz., Unit Scheme 1964, Unit Scheme 1971 (Unit Linked Insurance Plan), Unit Scheme for Charitable and Religious Trusts and Registered Societies 1981, Capital Gains Unit Scheme 1983, Children’s Gift Growth Fund Unit Scheme 1986 and Parents’ Gift and Growth Fund Unit Scheme 1987, catering to the various sections of society. A special mention needs to be made here of the more popular amongst the open-ended schemes, viz., those of 1964, 1971 and 1983. The US64 of UTI was involved in a scam in 2000–01 due to gross mismanagement. UTI has lost the confidence of investors and was in for liquidity problems.

Of the close-ended schemes, a majority are Monthly Income Scheme, specifically aimed at the retired and aged investors, giving the latter and assured level of income with total safety of capital. Among the close-ended ones, the Monthly Income Schemes with Extra Bouns and Growth benefits seem to be more popular with the investors.

For domestic investors, the UTI introduced a growth-oriented mutual fund know as “Mastersheres” in September 1986. The scheme was very popular, attracting funds of Rs. 1.58 billion against the original target of Rs. 500 million.

3.3 Common Rules for Mutual Funds

While the RBI guidelines for mutual funds set up by banks are welcome, banks which have floated mutual funds want that the regularoty framework for operating such funds should be common for all agencies wishing to float such funds and that there should be no discrimination between the different government agencies SEBI has also started regulating mutual funds registered with RBI. The guidelines issued by SEBI in 1992 are set out in Annexure II, while those of RBI are in Annexure I.

The banks are given permission for their mutual funds, set up by them to underwrite public issues just as the Unit Trust or insurance companies. The also are permitted to participate in the inter-bank call money market since 1990.

Since bank mutual funds are to be constituted as trusts, it was felt that these funds should be treated as trustees' securities and entitled to all the tax benefits available to such securities. In such case, the income on such funds is totally tax-free as in the case of UTI.

All incomes of Mutual Funds have now been exempt from taxation as in the case of UTI. Recently, mutual funds have been permitted to operate in the money market and the RBI has announced its willingness to permit banks to set up money market mutual funds, in 1995.

A mutual fund is exempted from tax payment under Section 10(23D), provided it distributes 90% of its profits.

3.4 Regulation of Mutual Funds

Leaving aside UTI, which has existed since 1964, two Financial Institutions namely, LIC and GIC have set up their Mutual Funds in 1989 and 1990 respectively. Since 1987, starting with SBI, a number of Public Sector banks has set up Mutual Funds, which have been regulated by the RBI. The Mutual Funds of LIC and GIC were regulated by the Investment Division of Ministry of Finance.

After SEBI got legal status in 1992, all Mutual Funds have been brought under its supervision, except the Money Market Mutual Funds and offshore Mutual Funds, which are also found by the guidelines of RBI, the Ministry of Finance. Nearly Rs. 60,000 crores were collected by UTI and an estimated Rs. 30,000 crores by various Mutual Funds set up since 1987, as contributions of savings from investors.

The Mutual Fund movement has got a startling momentum by 1990–91 but there was a setback to this in 1992, following the securities scam in which a number of banks and the Mutual Funds were involved in financial irregularities. Since then, the SEBI has tightened its regulations.

The new guidelines were laid down in respect of Mutual Funds for authorization and licensing of all Mutual Funds and each of their individual schemes. As visualized by the Government Policy, not only public sector, but private sector and joint sector mutual funds are now permitted and licensed by the SEBI. All mutual funds including bank sponsored MMMFs and many schemes of UTI are brought under the regulation of SEBI and Securities Appellate Authority.

Legal structure and organization of Mutual Funds :

Authorization of Existing Mutual Funds

Licensing and authorization of existing mutual funds was initiated by the SEBI, along with the licensing of Merchant bankers, even before the SEBI has got legal status in April 1992. As mutual funds were set up by public sector banks, they were authorized by RBI and each of their schemes was to be *approved by the latter*. But gradually SEBI took over the responsibility of authorizing and supervising them except in the case of pure Money Market Mutual Funds or the off-shore Mutual Funds which are governed by the regulations of RBI and Ministry of Finance.

| | |
|--------------------------|---|
| Board of Trustees | Sponsor of Mutual Fund (Company, Bank etc.) |
| Asset Management Company | Policy making body for fund raising and operations on the fund |
| Custodian | Actual implementation of the policy and investment operations |
| Investors | Acting as registrars, transfer agents and related services for the mutual fund |

Money Market Mutual Funds (MMMFs)

The MMMFs can be set up by scheduled Commercial Banks and FIs or companies as defined under Section 4A of Companies Act. The limit for these Funds set up by banks is at 2% of the sponsoring bank's fortnightly average aggregate deposits. They are intended to operate only in money market instruments like

commercial paper and as they should encourage individual participation in these funds, only individuals and NRI can subscribe to the Schemes of MMMFs. It was extended to companies also later. The minimum locking period was 30 days but was reduced to 15 days in 1998 and no minimum return should be guaranteed. The bank's reserve requirements will not apply to these funds, as per the Guidelines. During 2000, these funds were brought under the role supervision of SEBI. They are to be separate entities as Trusts. They are given some further concessions like cheque writing facility under the Monetary Policy Statement for 1999–2000 for gilt Funds and Liquid Income Schemes. Later on, the RBI has also allowed the Private Sector to set up MMMFs. RBI guidelines for MMMFs are set out in Annexure-III.

Authorization of New Mutual Funds

All Mutual Funds which are not exclusively dealing in Money Market instrument require authorization from the SEBI. This authorization is granted by the SEBI as per government guidelines since in March 1992.

Sponsor of Mutual Fund should be eligible for which it should be Register Company, scheduled Bank or all India or State level Financial Institutions to got track record, positive net worth, good management, fair dealings etc., sponsoring registered company should have a 40% stake in the paid-up equity of the Asset Management Company to beset by the sponsor.

The AMC should be a private or public limited company either limited or not. The AMC may be a new or a existing company, carrying on the business on march banking, venture capital, leasing or any other financial services. If the sponsor company is having a stake a 40% of its net worth as required, the rest can be brought in by public issue, NRIs or foreign equity participation as permitted by the RBI. The AMC should not invest funds in any company under any of its schemes managed it for which it has provided any financial service. The SEBI should approved Memorandum and Articles of Association of the AMC. The AMC itself will approve by the SEBI based on the MAA (Memorandum and Articles of Association) its business lines and subject to the restrictions on its business imposed under the guidelines.

3.5 Latest Trends

The performance of mutual funds and the investor confidence in them received a setback since 1996, particularly due to poor performance of UTI and many scams

involving UTI and banks. The nexus between banks and brokers has struck allow to the stock and capital markets and led to a negative resource mobilization during 1995–97 by all mutual funds, mainly due to the UTI. Since then, the performance of all public sector mutual funds showed market deterioration, while the performance of private sector mutual funds revealed a relatively better performance. The main depressing factor was the poor stock market conditions, following scams and poor asset management in UTI and public sector mutual funds, particularly during 1997–2001. But the recovery of the stock market after 2001 has enabled the MF industry to shine again in recent years.

SEBI has also banned Mutual Funds from making schemes with assured returns or make and claims on the basic of their part performance.

The norms relating to code of conduct of MFs, criteria for classification of NPAs and their disclosures, treatment of income accrued or NPAs and provisions to be made disclosure of NPAs in half-yearly portfolio reports were streamlined. The period of initial offer of a scheme and dispatch of certificates, standardization of format, treatment unclaimed deposits and the standards of trading by the employees were tightened Disclosure and transparency standards relating to the Asset Management Companies (AMCs) were also made stricter. The SEBI was given draconian powers of search at seizure and imposition of high penalties on listed companies and the broker firms.

Readers have perhaps noticed that there are two regulators for the MF industry—the SEBI and the RBI. MFs operating with money market schemes (that is, money market financial instruments) are regulated by the RBI, while MFs operating with capital market schemes (that is, capital market financial instruments) are under the control of the SEBI.

3.6 Annexure I

RBI Guideines on Mutual Funds

Some of the commercial banks in the public sector have set up mutual funds and a few others are in the process of setting them up. On a examination of the operations of the mutual funds already functioning, it was considered necessary to issue guidelines on certain important aspects, as indicated below, with a view to their orderly functioning and in the interest of ensuring investor confidence.

Constitution and Management

- (i) Every “mutual fund” shall be constituted as a Trust under the Indian Trust Act and the sponsoring bank should appoint a Board of Trustees to manage it. The Board of Trustees should have at least two outside trustees, i.e. those who are not connected with the sponsoring bank and who are persons of ability and integrity and have the proven capacity in dealing with problems relating to investment and investor protection. The overall superintendence, direction, control and management of the affairs and business, of the funds should vest in the Board of Trustees.
- (ii) The day-to-day management of the schemes under the fund, as may be delegated by the Board of Trustees, should be looked after by a full time Executive Trustee who should not be concurrently discharging any other responsibility in the convened bank. If the management of the mutual fund has been assigned to the bank’s subsidiary, the full time executive trustee should not be holding any other position.
- (iii) An “arm’s length” relationship should be maintained between the sponsor bank and the Board of Trustees who manage the mutual fund and care should be taken that in putting through the transactions, there is no clash of interest between the sponsor bank and the beneficiaries under the schemes of its mutual fund. In case the management of mutual fund has been entrusted to a subsidiary of the bank, similar care should be exercised by the latter to avoid any clash of interest between itself and the beneficiaries under the scheme of the mutual fund.
- (iv)
 - (a) The sponsor bank’s contribution to the corpus of the fund should be a minimum of Rs. 25 lakh or such higher amount as may be specified by the Reserve Bank. The corpus may be converted at a later date into subscription to any of the schemes of the fund with the approval of the Board of Trustees of the Fund. No additional contribution should be made by the Board of Trustees of the fund. No additional contribution should be made by the sponsor bank to the corpus without the prior approval of the Reserve Bank.
 - (b) In addition to the contribution to the corpus, the sponsor bank should contribute and maintain in each of the fund’s schemes by way of its stake an amount equivalent to 1 per cent of the total amount outstanding. This stipulation will not however, apply to special schemes wherein the sponsor bank cannot participate.

- (v) Banks should obtain the Reserve Bank's prior approval before announcing any scheme of a mutual fund, irrespective of whether it is identical or not to any of the earlier schemes approved by the Reserve Bank.

Investment Objectives and Policies

- (vi) The investment objectives and policies of the mutual fund should be laid down in the trust deed and every scheme to be launched by the fund must be in accord with such broad objectives and policies and the rules and regulations framed in conditions therewith.
- (vii) While inviting subscription from the public, the mutual fund should make statement of the investment objectives of the fund and its investment policies, besides the terms and conditions of the scheme.
- (viii) The subscription amounts collected by mutual funds are primarily intended to be channelised into the capital market instruments like government and other trustee securities, share/debentures of public limited companies, bonds and public sector undertakings, etc. and except for the extent indicated in (ix) below, the mutual funds should not undertake direct or indirect lending, portfolio/funds management, underwriting, bills discounting, money market operations, etc., which are essentially banking/merchant banking functions.
- (ix) There is, however, no objection to the mutual funds investing the amounts initially collected for a scheme in the money market instruments, rediscounting of bills, or bank deposits for periods not exceeding six months. The mutual funds may also invest their temporary surplus fund in similar instruments up to not more than 25 per cent of their total investible funds. Such short-term/temporary investments can, however, be made only if they are permissible under the Charter of the Fund.
- (x) The mutual funds should invariably ensure delivery of scrips purchase and in the case of scrips sold, give delivery thereof to the purchaser. The scrips purchased should be transferred in the funds name.
- (xi) In no event should a mutual fund make short sale/purchase of securities or carry over the transactions from one settlement period to the next settlement period.
- (xii) The mutual funds should not make investments in any other unit trust, mutual fund or similar collective investment schemes. The funds should not also invest in the shares etc. of investment companies/corporations.

Prudential Exposure Ceiling Limits

- (xiii) From the point of view of spreading the risk it is necessary that the portfolio of a funds diversified. A mutual fund should follow the following prudential guidelines in this regard :
- (a) It should not hold, under any one scheme, more than 5 per cent of issued share capital or debenture stock of any company. In case more than one scheme is operated by a fund, such holdings in respect of all its schemes put together should not exceed 15 per cent of the paid-up capital or debenture stock of a company.
 - (b) The total amounts invested by a fund from any of its schemes in the shares, debentures etc. of any specific industry (such as cotton textiles, tea, tyres etc.) should nor exceed 15 per cent of a scheme's fund. This provision will not, however, apply to a scheme which has been floated for investment in one or more specified industries, and a declaration has been made to that effect.

Pricing Policy

- (xiv) The maximum spread between the purchase and selling prices of nits/ shares of any scheme should not be more than 5%.

Income Distribution

- (xv) The total cost of managing any scheme under a fund, including management fees and other administrative costs, should be kept within 5 per cent of the total income of the scheme.
- (xvi) Income distribution by way of divided or capitalisation of gains should not be made on the basis of revaluation of the stock holdings or unrealised capital appreciation.
- (xvii) Depreciation on investments held and provision for bad or doubtful debts, if any, have to be provided for to the satisfaction of auditors before declaring any dividend. Further, a fund should also create a divided equalisation fund for each scheme by appropriating a part of its surplus income. Have to be provided for to the satisfaction of auditors before declaring an dividend. Further, a fund should also create a dividend equalisation fund for each scheme by appropriating a part of its surplus income.

Statement of Accounts and Disclosure

- (xviii) A mutual fund should maintain separate accounts of each scheme launched by it, segregating the assets under each scheme. No switching of assets between the schemes should take place, except with the prior approval of the Board of Trustees and at the prevailing market rates.
- (xix) The Board of Trustees of mutual funds should prepare an annual statements of accounts in respect of each of the schemes which should contain, *inter alia*, statements of assets and liabilities and income and expenditure accounts duly audited by qualified auditors. Further, an abridged version of the annual account together with the reports of auditors and the Board of Trustees should be published for the information of subscribers to the concerned scheme.
- (xx) The Board of Trustees of mutual funds should disclose the net asset value of each of the schemes and the method of valuation for the benefit of the concerned subscribers.
- (xxi) Sponsor banks should furnish to the Reserve Bank duplicate, the following reports on a regular basis :
 - (a) A half-yearly reports indicating the performance of the mutual fund as a whole as well as each scheme.
 - (b) Audited annual statements of accounts, together with the reports of auditors and the report of the board of trustees.
 - (c) Scheme-wise details of investment portfolio of the funds, value of such investments, changes in the portfolio since the previous annual report and industry-wise exposure.

3.7 Questions

1. Discuss the legal structure and organization of Mutual Funds.
2. What are the Common Rules for Mutual Funds?
3. Discuss the implications of RBI guidelines for Mutual Funds.
4. How is investment in a Mutual Fund Different from a Bank Deposit?
5. What are sector funds?
6. What is the difference between open ended and close ended schemes?
7. Discuss the types of Mutual Fund Schemes available in India.

8. What are the benefits of investing in a mutual fund? Or, Why shall I invest in a mutual fund?
9. Narrate History of the Indian Mutual Fund Industry.
10. What is NAV and how is it calculated?
11. How are mutual funds different from Portfolio Management Schemes?

Short-answer type questions

12. Distinguish between a Mutual Fund and a Venture Capital Fund.
13. How would a unit holder behave if interest rates fall?

Objective type questions

14. **Tik the correct statement :** (a) All MFs are regulated by the SEBI; (b) All MFs are regulated by the RBI; (c) Some MFs are regulated by the SEBI and others are regulated by the RBI.

3.8 References

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Unit 4 □ International Financial Institutions

Structure

- 4.1 International Financial System**
- 4.2 Network of Global Organizations**
- 4.3 World Bank History**
- 4.4 Five Agencies, One Group**
- 4.5 The International Monetary Fund**
- 4.6 The Bank for International Settlements (BIS)**
- 4.7 The BIS's Establishment**
- 4.8 Questions**
- 4.9 Reference**

4.1 International Financial System

International financial system refers to management of and Trading in international money and monetary assets. These monetary assets are claims on foreign currency, foreign deposits and investments and/or foreign assets. The claims may be denominated in various foreign currencies bought and sold and involve exchange between various currencies. The difference between the domestic financial system and international financial system lies in the exchange of one currency for another or exchange of one asset in one currency for another denominated in a different currency. Conversion of one currency into another has its impact on the balance of payments. If more foreign currency is needed for meeting foreign claims than is earned when foreigners meet claims of nationals, a deficit will arise, which may be met by borrowing foreign currency from international financial institutions. Hence the need for studying international financial institutions.

- Synergistic value (SyV) : the drive to create synergy in the business
- Protective value (PV) : the optimum value that has to be protected to maintain sustainability
- Sweat Value (SwV) : to make good the erosion of value through business engineering
- Opportunity Value (OV) : identifying the relevant opportunities for value maximization.

4.2 Network of Global Organizations

International financial system comprises certain institutions. These are as follows :

- *The World Bank* (Also known as the International Bank for Reconstruction and Development) Project Lending; Long-term adjustment and growth oriented stabilization with long-term loans (a part of international capital market).
- *The International Monetary Fund* : Creation of Liquidity through SDR allocations; Jurisdiction over exchange rates, lending for short-term (a part of global money market)
- *Bank for International Settlement* : Supervision of national banking; provision of emergency facilities; co-ordination of monetary policy of member countries
- *G-8 Finance Ministers* : Surveillance of financial policy and announcement of global economic trends.

Basic responsibilities of these organizations are given against the names of these organizations below.

4.3 World Bank History

Conceived during World War II at Bretton Woods, New Hampshire, the World Bank initially helped rebuild Europe after the war. Its first loan of \$250 million was to France in 1947 for post-war reconstruction. Reconstruction has remained an important focus of the Bank's work, given the natural disasters, humanitarian emergencies, and post conflict rehabilitation needs that affect developing and transition economics. It has given attention to environmental considerations to project loans to member countries in recent times.

Today's Bank, however, has sharpened its focus on poverty reduction as the overarching goal of all its work. It once had a homogeneous staff of engineers and financial analysts, based solely in Washington, D.C. Today, it has a multidisciplinary and diverse staff including economists, public policy experts, sectoral experts, and social scientists. 40 percent of staff are now based in country offices.

The Bank itself is bigger, broader, and far more complex. It has become a Group, encompassing five closely associated development institutions : the International Development Association (IDA), the International Finance Corporation (IFC), the

Multilateral Investment Guarantee Agency (MIGA), and the International Centre for Settlement of Investment Disputes (ICSID).

Transition

During the 1980s, the Bank forayed in many directions : early in the decade, the Bank was brought face to face with macroeconomic and debt rescheduling issues; later in the decade, social and environmental issues assumed center stage, and an increasingly vocal civil society accused the Bank of not observing its own policies in some high profile projects.

To address concerns about the quality of Bank operations, the Wapenhans Report was released and soon after, steps toward reform were taken, including the creation of an inspection Panel to investigate claims against the Bank. However, criticism increased, reaching a peak in 1994 at the Annual Meetings in Madrid.

Reform and Renewal

Since then, the Bank Group has made much progress. Its affiliated institutions have been working separately and in collaboration – to improve internal efficiency and external effectiveness. Clients are reported to be broadly pleased with the changes they see in Bank Group service levels, commitment, deliveries, and quality.

More than ever before, the Bank is playing an important role in the global policy arena. It has effectively engaged with partners and clients in complex emergencies from post-conflict work in Bosnia to post-crisis assistance in East Asia to post-hurricane clean-up in central America to post-earthquake support in Turkey and in Kosovo and East Timor and Tsunami-affected south-east Asia.

Member Countries

The organizations that make up the World Bank Group are owned by the governments of member nations, which have the ultimate decision-making power within the organization on all matters, be they policy, financial, or membership issues.

There is a Corporate Secretariat within the World Bank which coordinates the work of the Bank's shareholders and within that a Membership and Capital Subscriptions Unit concerned with new membership.

Member countries govern the World Bank Group through the Board of Governors and the Executive Directors. These bodies make all major decisions for the organizations.

General Procedures

1. Before a country may join the International Bank for Reconstruction and Development (World Bank), it must become a member of the International Monetary Fund (Fund). Also, membership in the International Finance Corporation (IFC), the International Development Association (IDA) and the Multilateral Investment Guarantee Agency (MIGA) are conditioned on membership in the Bank. Please note, however, that the procedures for membership in the Fund, the Bank, IFC, IDA and MIGA can be arranged to be completed more or less simultaneously. Also included is information on joining the International Centre for Settlement of Investment Disputes (ICSID).

2. The procedures are generally as follows. The first formal step in the membership process is for a prospective member to submit an application for membership. Upon receipt of the applications, and once the Fund quota has been determined, the authorities of the applicant country will be consulted on whether the proposed corresponding subscriptions in the Bank, IFC, IDA and MIGA are acceptable. Upon confirmation that the proposed subscriptions are acceptable, the applications will be considered by the Executive Directors of the Bank and IDA, and by the Boards of Directors of IFC and MIGA. Upon a favourable outcome, the Executive Directors of the Bank and IDA and the Boards of Directors of IFC and MIGA will recommend to the Boards of Governors (the Council of Governors in the case of MIGA) that the applicant country be admitted to membership under terms and conditions specified in resolutions to be adopted by the Boards of Governors. The voting procedure usually takes about six weeks. During that time, the authorities of the applicant country would be expected to take such steps as are required under its constitutional procedures (including the adoption of legislation) to authorize it to make the subscription payments and undertake the obligations of a member of the organizations. The exact nature of these steps and the contents of proposed legislation would be discussed with the Bank's legal staff, and would be generally similar to those relating to membership in the Fund. Once the following steps have been taken, namely, the membership resolutions are adopted, the subscription payments have been made, certain documents have been furnished to the organizations, and the applicant country has signed the Articles of Agreement of the Fund, then the applicant country will be in a position to sign the original of the Articles of Agreement of the Bank, IFC and IDA, and the MIGA Convention in Washington, D.C., and to deposit the instrument of ratification of the MIGA Convention, thus completing the membership process.

3. The subscriptions required of a new member vary with each organization, and can only be determined once the member's quota in the Fund has been determined. Moreover, the policies governing the initial subscriptions are modified from time to time to deal with changing circumstances. For these reasons, the subscriptions and the corresponding payments can only be described in general terms as they currently are established.

4. All the shares of the Bank's capital stock are valued at \$120,635 per share. Under the Bank's current practice, the capital subscription of a new member consists of two components. The first is an obligatory subscription which the new member must subscribe at the time it joins the Bank. This obligatory subscription has two parts. The first part is derived from the member's quota in the Fund, and is currently equal to 88.29% of the member's Fund quota. The second part is based on a fixed number of 195 shares, which represents the portion of the membership shares corresponding to the increase in the subscriptions of members authorized in conjunction with the Bank's 1988 general capital increase. With respect to each share of this subscription, the member must pay 0.60% of the price in U.S. dollars in cash and 5.40% in the member's currency or in U.S. dollars. The 5.40% may be paid in cash or by means of non-negotiable, non-interest-bearing notes. The balance of the price of the shares consists of callable capital.

5. The second component, subscription of which is optional, consists of 250 shares with respect to which no payment is due at the time of subscription. The total price of these shares is made up of callable capital. All members of the Bank were offered to subscribe 250 "membership" shares on these terms in 1979 to avoid dilution of the voting power of the smaller members of the Bank as a result of the 1979 general capital increase. New members are also authorized to subscribe 250 shares on the same terms and conditions.

6. The members of IDA are classified as "Part I" members (mostly developed countries which contribute to the resources of IDA), and "Part II" members (mostly developing countries, some of which also contribute to the resources of IDA).

7. The initial obligatory subscription of a new member in IDA bears a fixed arithmetical ratio to that member's obligatory subscription in the Bank. The current ratio is 1.07% of the subscription in the Bank.

8. The member's initial subscription to IDA is payable differently for Part I and Part II countries. Part I countries must pay the total amount of their initial subscription in U.S. dollars or any other freely convertible currency, whereas Part II

countries are required to pay only 10% of the initial subscription in U.S. dollars (or any other freely convertible currency), and may pay the remaining 90% in the member's currency. Non-negotiable, non-interest-bearing demand notes can be substituted for the 90% amount.

9. In addition to the obligatory subscription, new Part II members are entitled to make additional subscriptions in IDA corresponding to the third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth IDA replenishments and meant to maintain the voting power of Part II countries. These additional subscriptions are payable in the member's currency, in cash or in non-negotiable, non-interest-bearing demand notes.

10. New Part I members of the Association are treated, for purposes of determining their voting rights, in the same way as members that have been in the Part I group since IDA's inception. This means that the "effective" cost of subscription votes for a new Part I member is the same as for current members. Additionally, every new IDA member is entitled to membership votes, currently 27,100, through IDA12.

11. In IFC, a new member's subscription is based on its subscription in the Bank, such that the percentage of its share allocation in IFC's capital is equal to the percentage of its share allocation in the Bank's capital.

12. IFC shares are valued at US\$1,000 each and are payable in full in U.S. dollars or other fully convertible currencies.

13. In MIGA, the subscription of a new member is calculated on the basis of the member's relative allocated capital subscription in the Bank as of March 31, 1985, assuming for the purposes of calculation that the member's subscription in the Bank had been equivalent to the first component of that member's obligatory subscription, and of the 250 "membership" shares that are explained above.

14. Shares of MIGA's capital stock are valued at \$10,820 per share. Ten per cent of the price of shares is payable in cash and another 10% is payable in the form of non-interest-bearing notes or similar obligations. The amount payable in cash would be payable as follows : Category One (mostly developed countries) members would pay the entire amount in a freely usable currency, and Category Two members (mostly developing countries) could pay up to 25% in their currency, the remaining 75% being payable in a currency designated by MIGA as being freely usable. The amount payable in notes would be payable in full in one of the designated freely usable currencies. At the present time, the currencies designated as freely usable are

the Euro, the Japanese Yen, the Pound Sterling and the United States Dollar. The remaining 80% of the subscribed shares are subject to call by the Agency.

15. In addition to completing the required subscription payments, a new member is required to furnish to the Bank, IFC, IDA and MIGA with certain documents, including the enabling legislation authorizing the member to accede to membership in the organizations, an instrument of acceptance of the Articles of Agreement of the Bank, IFC and IDA, a memorandum of law with respect to membership in the Bank, full powers authorizing the prospective member's representative to sign the Articles of Agreement of the Bank, IFC, IDA and the MIGA Convention, and an instrument of ratification for membership in MIGA.

16. ICSID provides a voluntary framework for conciliation and arbitration of investment disputes between foreign investors and host countries. There is no need to apply formally to join ICSID. The procedure for joining ICSID consists of signature and ratification of the ICSID Convention. These formalities can take place as soon as the country has become a member of the Bank.

Voting Powers

Like all corporate organizations, each of the agencies of the World Bank Group has shareholders; these are the member countries. Every shareholder is allocated a certain number of votes linked to the size of its shareholding. The votes include a specified number of membership votes (which is the same for all members) and additional votes based on the number of shares of the stock held. The number of votes of a member expressed as a percentage of the total number of votes held by all shareholders is the member's voting power.

4.4 Five Agencies, One Group

The World Bank Group consists of five closely associated institutions, all owned by member countries that carry ultimate decision-making power. As explained below, each institution plays a distinct role in the mission to fight poverty and improve living standards for people in the developing world. The term "World Bank Group" encompasses all five institutions.

The International Bank for Reconstruction and Development (World Bank)

Established 1945, 184 Members

Cumulative lending : \$394 billion

Fiscal 2004 lending : \$11 billion for 87 new operations in 33 countries

IBRD aims to reduce poverty in middle-income and creditworthy poorer countries by promoting sustainable development through loans, guarantees, and (nonlending) analytical and advisory services. The income that IBRD has generated over the years has allowed it to fund several developmental activities and to ensure its financial strength, which enables it to borrow in capital markets at low cost and offer clients good borrowing terms. IBRD's 24-member Board is made up of 5 appointed and 19 elected Executive Directors, who represent its 184 member countries.

The International Development Association

Established 1960, 165 Members

Cumulative commitments : \$151 billion

Fiscal 2004 commitments : \$9 billion for 158 new operations in 62 countries

Contributions to IDA enable the World Bank to provide approximately \$6 billion to \$9 billion a year in highly concessional financing to the world's 81 poorest countries (home to 2.5 billion people). IDA's interest-free credits and grants are vital because these countries have little or no capacity to borrow on market terms. In most of these countries, the great majority of people live on less than \$2 a day. IDA's resources help support country-led poverty reduction strategies in key policy areas, including raising productivity, providing accountable governance, improving the private investment climate, and improving access to education and health care for poor people.

The International Finance Corporation

Established 1956, 176 Members

Committed portfolio : \$23.5 billion (includes \$5.5 billion in syndicated loans)

Fiscal 2004 commitments : \$4.8 billion for 217 projects in 65 countries

IFC promotes economic development through the private sector. Working with business partners, it invests in sustainable private enterprises in developing countries without accepting government guarantees. It provides equity, long-term loans, structured finance and risk management products, and advisory services to its clients. IFC seeks to reach businesses in regions and countries that have limited access to capital. It provides finance in markets deemed to risky by commercial investors in the absence of IFC participation and adds value to the projects it finances through its corporate governance, environmental, and social expertise.

The Multilateral Investment Guarantee Agency

Established 1988, 165 Members

Cumulative guarantees issued : \$13.5 billion (Amounts include funds leveraged through the Cooperative Underwriting Program)

Fiscal 2004 guarantees issued : \$1.1 billion

MIGA helps promote foreign direct investment in developing countries by providing guarantees to investors against noncommercial risks, such as expropriation, currency inconvertibility and transfer restrictions, war and civil disturbance, and breach of contract. MIGA's capacity to serve as an objective intermediary and to influence the resolution of potential disputes enhances investors' confidence that they will be protected against these risks. In addition, MIGA provides technical assistance and advisory services to help countries attract and retain foreign investment and to disseminate information on investment opportunities to the international business community.

ICSID : The International Centre for Settlement of Investment Disputes

Established 1966, 140 Members

Total cases registered : 159

Fiscal 2004 cases registered : 30

ICSID helps encourage foreign investment by providing international facilities for conciliation and arbitration of investment disputes, thereby helping foster an atmosphere of mutual confidence between states and foreign investors. Many international agreements concerning investment refer to ICSID's arbitration facilities, ICSID also issues publications on dispute settlement and foreign investment law.

4.5 The International Monetary Fund

About the IMF

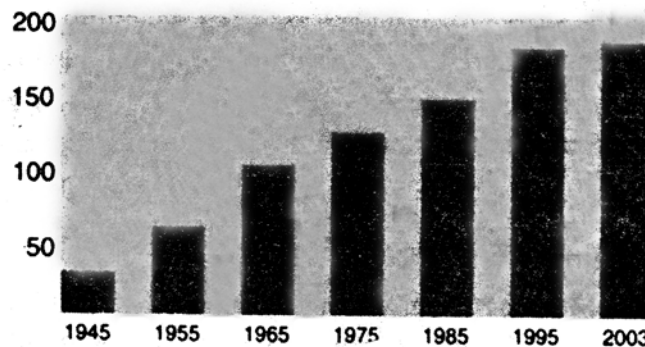
The IMF is an international organization of 184 member countries. It was established to promote international monetary cooperation, exchange stability, and orderly exchange arrangements; to foster economic growth and high levels of employment; and to provide temporary financial assistance to countries to help ease balance of payments adjustment.

Since the IMF was established its purposes have remained unchanged but its operations—which involve surveillance, financial assistance, and technical assistance—

have developed to meet the changing needs of its member countries in an evolving world economy.

Growth in IMF Membership, 1945–2003

(number of countries)



Articles of Agreement of the International Monetary Fund

Article I – Purposes

The purposes of the International Monetary Fund are :

- To promote international monetary cooperation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems.
- To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy.
- To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.
- To assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade ?
- To give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity.

In accordance with the above, to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.

The Fund shall be guided in all its policies and decisions by the purposes set forth in this Article.

The IMF at a Glance

The International Monetary Fund was created in 1945 to help promote the health of the world economy. Headquartered in Washington D.C., it is governed by and accountable to the governments of the 184 countries that make up its near-global membership.

What is the International Monetary Fund?

The International Monetary Fund—also known as the “IMF” or the “Fund”—was conceived at a United Nations conference convened in Bretton Woods, New Hampshire, U.S. in July 1944. The 45 governments represented at that conference sought to build a framework for economic cooperation that would avoid a repetition of the disastrous economic policies that had contributed to the Great Depression of the 1930s.

Facts about the IMF (as in 2005)

Membership by August 2005 : 184 countries

Staff : approximately 2,700 from 141 countries

Total Quotas : \$327 billion

Loans outstanding : \$90 billion to 82 countries, of which \$10 billion to 59 on concessional terms
Technical Assistance provided : 367 person years during FY2004
Surveillance consultations concluded : 115 countries during FY2004, of which 92 voluntarily published their staff reports. Article I of the Articles of agreements sets out the IMF's main responsibilities : promoting international monetary cooperation; facilitating the expansion and balanced growth of international trade; promoting exchange stability; assisting in the establishment of a multilateral system of payments; and making its resources available (under adequate safeguards) to members experiencing balance of payments difficulties.

IMF Activities

More generally, the IMF is responsible for ensuring the stability of the international monetary and financial system—the system of international payments and exchange

rates among national currencies that enables trade to take place between countries. The Fund seeks to promote economic stability and prevent crises; to help resolve crises when they do occur, and to promote growth and alleviate poverty. It employs three main functions—surveillance, technical assistance, and lending—to meet these objectives.

The IMF works to promote global growth and economic stability—and thereby prevent economic crisis—by encouraging countries to adopt sound economic policies.

Surveillance is the regular dialogue and policy advice that the IMF offers to each of its members. Generally once a year, the Fund conducts in-depth appraisals of each member country's economic situation. It discusses with the country's authorities the policies that are most conducive to stable exchange rates and a growing and prosperous economy. The IMF also combines information from individual consultations to form assessments of global and regional developments and prospects.

Technical assistance and training are offered—mostly free of charge—to help member countries strengthen their capacity to design and implement effective policies. Technical assistance is offered in several areas, including fiscal policy, monetary and exchange rate policies, banking and financial system supervision and regulation, and statistics.

In the event that member countries do experience difficulties financing their balance of payments, the IMF is also a fund that can be tapped to help in recovery.

Financial assistance is available to give member countries the breathing room they need to correct balance of payments problems. A policy program supported by IMF financing is designed by the national authorities in close cooperation with the IMF, and continued financial support is conditional on effective implementation of this program. Incidentally, the Economic Reforms in India, started from 1991, are an offshoot of the IMF policy advice rendered to India when in the late 1980s the latter had to approach the IMF for helping her tackle the serious balance of payments problem which was threatening to upset economic growth in the country.

The IMF is also actively working to reduce poverty in countries around the globe, independently and in collaboration with the World Bank and other organizations.

IMF Governance and Organization

The IMF is accountable to the governments of its member countries. At the apex of its organizational structure is its board of governors, which consists of one

Governor from each of the IMF's 184 member countries. All Governors meet once each year at the IMF-World Bank Annual Meetings; 24 of the Governors sit on the International Monetary and Finance Committee (IMFC) and meet twice each year. The day-to-day work of the IMF is conducted at its Washington D.C. headquarters by its 24-member executive board; this work is guided by the IMFC and supported by the IMF's professional staff.

The IMF's resources are provided by its member countries, primarily through payment of quotas, which broadly reflect each country's economic size. The total amount of quotas is the most important factor determining the IMF's lending capacity. The annual expenses of running the Fund are met mainly by the difference between interest receipts (on outstanding loans) and interest payments (on quota "deposits").

Board of Governors of IMF

The *Board of Governors*, the highest decision-making body of the IMF, consists of one governor and one alternate governor for each member country. The governor is appointed by the member country and is usually the minister of finance or the governor of the central bank. All powers of the IMF are vested in the Board of Governors. The Board of Governors may delegate to the Executive Board all except certain reserved powers. The Board of Governors normally meets once a year.

4.6 The Bank for International Settlements (BIS)

About BIS

The Bank for International Settlements (BIS) is an international organisation which fosters international monetary and financial cooperation and serves as a bank for central banks. The BIS fulfils this mandate by acting as :

- a forum to promote discussion and facilitate decision-making processes among central banks and within the international financial community
- a centre for economic and monetary research
- a prime counterparty for central banks in their financial transactions
- agent or trustee in connection with international financial operations.

The head office is in Basel, Switzerland and there are two representative offices : in the Hong Kong Special Administrative Region of the People's Republic of China and in Mexico City.

Established on 17 May 1930, the BIS is the world's oldest international financial organization.

As its customers are central banks and international organisations, the BIS does not accept deposits from, or provide financial services to, private individuals or corporate entities. The BIS strongly advises caution against fraudulent schemes.

4.7 The BIS's Establishment

The Bank for International Settlements was established in 1930. It is the world's oldest international financial institution and remains the principal centre for international central bank cooperation.

The BIS was established in the context of the Young Plan (1930), which dealt with the issue of the reparation payments imposed on Germany by the Treaty of Versailles following the First World War. The new bank was to take over the functions previously performed by the Agent General for Reparations in Berlin : collection, administration and distribution of the annuities payable as reparations. The Bank's name is derived from this original role. The BIS was also created to act as a trustee for the Dawes and Young Loans (international loans issued to finance reparations) and to promote central bank cooperation in general.

The reparations issue quickly faded, focusing the Bank's activities entirely on cooperation among central banks and, increasingly, other agencies in pursuit of monetary and financial stability.

The Changing Role of the BIS

Meetings in Basel of central bank Governors and experts from central banks and other agencies attempted to smoothen the global banking system through cooperation. In support of this cooperation, the Bank has developed its own research in financial and monetary economics and makes an important contribution to the collection, compilation and dissemination of economic and financial statistics.

In the monetary policy field, cooperation at the BIS in the immediate aftermath of the Second World War and until the early 1970s focused on implementing and defending the Bretton Woods system. In the 1970s and 1980s, the focus was on managing cross-border capital flows following the oil crises and the international debt crisis. The 1970s crisis also brought the issue of regulatory supervision of internationally active banks to the fore, resulting in the 1988 Basel Capital Accord

and its “Basel II” revision of 2001–06. More recently, the issue of financial stability in the wake of economic integration and globalisation, as highlighted by the 1997 Asian crisis, has received a lot of attention.

Apart from fostering monetary policy cooperation, the BIS has always performed “traditional” banking functions for the central bank community (eg gold and foreign exchange transactions), as well as trustee and agency functions. The BIS was the agent for the European Payments Union (EPU, 1950–58), helping the European currencies restore convertibility after the Second World War. Similarly, the BIS has acted as the agent for various European exchange rate arrangements, including the European Monetary System (EMS, 1979–94) which preceded the move to a single currency.

Finally, the BIS has also provided or organised emergency financing to support the international monetary system when needed. During the 1931–33 financial crisis, the BIS organised support credits for both the Austrian and German central banks. In the 1960s, the BIS arranged special support credits for the Italian lira (1964) and the French franc (1968), and two so-called Group Arrangements (1966 and 1968) to support sterling. More recently, the BIS has provided finance in the context of IMF-led stabilisation programmes (eg for Mexico in 1982 and Brazil in 1998).

Since 1930, central bank cooperation at the BIS has taken place through the regular.

Governance Structures

The BIS archives are open to the public. Under the BIS open archive rules, all records relating to the Bank’s business and operational activities which are over 30 years old are available for consultation, with the exception of a limited number of records.

Organisation and Governance

The BIS currently employs 560 staff from 49 countries.

All members of staff are required to behave in accordance with general principles laid down in the staff code of conduct. The BIS Compliance Charter.

Decisions taken at each of these levels concern the running of the Bank and as such are mainly of an administrative and financial nature, related to its banking operations, the policies governing internal management of the BIS and the allocation of budgetary resources to the different business areas.

The Bank's administrative and budgetary rules apply to the committees hosted by the BIS. Other aspects of the committees' governance are the responsibility of the body to which each reports.

General Meetings

The BIS currently has 55 member central banks, all of which are entitled to be represented and vote in the General Meetings. Voting power is proportionate to the number of BIS shares issued in the country of each member represented at the meeting.

At the Annual General Meeting, key decisions by member central banks focus on distribution of the dividend and profit, approval of the annual report and the accounts of the Bank, adjustments in the allowances paid to Board members, and selection of the Bank's external auditors. The Annual General Meeting is held in late June/early July.

Extraordinary General Meetings must be called in order to amend the Statutes of the Bank, change its equity capital or liquidate the Bank.

4.8 Questions

Essay-type questions

1. Discuss the role played by the World Bank.
2. Discuss the role played by the IMF.

Short answer questions

3. What do you mean by the term 'International Financial System' ?
4. Who are the members of the World Bank Group ?

Objective-type questions (tik the correct answer) :

5. The world Bank has helped (a) only India, (b) only Pakistan, (c) both India and Pakistan.
6. The IMF lends (a) only for short term, (b) only for long term, (c) for both short term and long term.

4.9 Reference

V. A. Abadhani, International Finance (1993), Himalaya Publishing House, Mumbai.

Unit 5 □ Overview of Indian Stock Market : Primary and Secondary

Structure

- 5.1 Introduction**
- 5.2 Securities and Exchange Board of India**
- 5.3 Organizational Structure**
 - 5.3.1 Financial Markets**
 - 5.3.2 Money Market**
 - 5.3.3 Capital Market**
 - 5.3.4 Major Financial Institutions/Intermediaries**
- 5.4 Non-banking Financial Companies (NBFCs)**
- 5.5 Development/Public Financial Institutions (DFIs/PFIs)**
- 5.6 Model Questions**

5.1 Introduction

Stock Market (Securities Market)

A part of the capital market, stock (securities) markets have occupied a centre stage in the economic transformation (development) of market economics in our times. Before 1947 (independence), the securities market was a marginal institution in India. But today it is a big segment participated by many players, both private and public, domestic and foreign. This market has two parts : the primary market and the secondary market.

The Primary Market

Also called the new issue market, where savings of households and firms are exchanged for new issues of securities. These new issues include issues of newly incorporated firms (initial issues), new securities issued by established companies (further issues) and by the government (which issues only debt securities).

The Secondary Market

Also called the second hand market, the secondary market deals in securities already bought and sold. The chief operator in this market is the network of stock

exchanges where the newly issued securities of public limited (but not private limited) companies can be bought and resold many times. This facility confers liquidity upon the scripts of the primary market. Thus, the secondary market helps the growth of the primary market. If the scrips acquired in the primary market could not be resold, most individuals and institution would not have acquired them at all, and so it would be difficult for the primary market to develop and serve the economy by collecting a part of the savings of the community and transfer them to the different productive sectors for use. Merchant bankers and brokers help the fund-raising function of corporate firms and the government. The SEBI in our country has prepared rules and regulations which have to be observed by the players in the market so that interests of savers and investors are duly protected.

Both the primary and the secondary segments of the Indian securities market have increased in size and variety over the years. Technology upgradation has reduced cost and improved efficiency of operations. The latest addition in this market is the derivative, a detailed analysis of which has been made in chapters 10, 11 and 12 in Module-2.

5.2 Securities and Exchange Board of India

The securities market which emerged from the periphery to enter the mainstream of the financial market in India has been one of the most significant institutional developments since the mid-eighties, especially since the beginning of the nineties. It has witnessed a spectacular growth, both terms of its ability to mobilize resources and to allocate it with some efficiency. The corporate sector has come to rely on the securities market increasingly to finance its long-term requirements of funds, in contrast to a decade earlier when the DFIs were the sole purveyors of long-term funds. As logical corollary, there has also been a growth in the awareness and interesting investment opportunities available in the securities market among investors. To help sustain this growth and crystallize the awareness and interest into a committed, discerning and growing pool of investors the investor's right must be fully protected, trading malpractices are being prevented and structural inadequacies of the market recovered.

Although a fairly comprehensive legislative code was built up in the earlier phase, the focus was on control. The framework was fragmented, both in terms of the laws/acts under which the regulator functions fell and the agencies and Government departments that administered them. For example, the Capital Issues (Control) Act

was administered by the Controller of Capital Issues (CCI) in the Ministry of Finance. The scheme of control under the Act required all the companies to obtain prior consent for issues of capital to the public. Under this arrangement, the pricing as well as the features of the capital structure such as debt-equity ratios were controlled by the Government. Likewise, the Securities Contracts (Regulation) Act was administered by the Directorate of Stock Exchange, also in the Ministry of Finance. Its aim was to prevent undesirable transactions in the securities. It empowered the Government to recognize/de-recognize stock exchange, stipulate rules for their functioning, compel listing of securities by public companies, and so on. Such a system of regulation/control was inadequate in the context of the liberalized economic scenario. In such a milieu, regulation of a different kind was called for.

The need of the growing securities market in India was a focused/integrated regulatory framework and its development by an independent/autonomous body. This was sought to be achieved by the establishment of the Securities and Exchange Board of India (SEBI) in April 1988 by an administrative order and later by an ordinance which was replaced by the SEBI Act in April 1992, making it a statutory autonomous body.

The SEBI has been set up to both regulate and promote the securities market. The SEBI registers, regulates and monitors various intermediaries in the capital market. It is empowered to exclusively regulate the primary market after the repeal of Capital Issues (Control) Act and the consequent abolition of the office of the CCU. However, presently there is dual control of the Government and the SEBI on the secondary markets. Certain powers under the Securities Contracts (Regulation) Act have been delegated to the SEBI to regulate the dealings on the stock exchanges. It has been vested with powers to inspect and enquire into the affairs of the stock exchanges and its members. It can also issue directions for regulating the dealings in securities, ensuring transparency in transactions on the stock exchanges and also between the stock brokers and their constituents. The SEBI's aim is to attain a pragmatic balance between the two approaches to regulation, namely, self-regulation and statutory regulation.

The following portion of this chapter should be read along with chapter I.

5.3 Organizational Structure

The evolution, reform and management of financial system/sector is a process rather than an event. It cannot be separated from reform in the real sector. They are

mutually reinforcing, sustaining and sustained by each other. A board-based organizational structure of the Indian financial system has emerged in response to the requirements of the emerging industrial organization as depicted in the preceding discussion relating to its evolution. The present organizational structure of the Indian financial system comprises of three interdependent components : (i) Finance market, (ii) Financial institutions/intermediaries and (iii) Financial assets/instruments/securities. A bird's eye view of their main elements is portrayed in this section.

5.3.1. Financial Markets

One significant components of the organization of the financial system in India comprises of financial markets which perform a crucial function in the savings-investment process as facilitating organizations. They are not sources of finance but they are a link between the savers and investors both individual as well as institutional. Based on the nature of funds which are the stock-in-trade, the financial markets are classified into (i) Money market and (ii) Capital/securities market.

5.3.2. Money Market

Money market is a market for dealing in liquid near money assets of short-term nature, generally less than one year. It refers to that segment of the financial market which enables the raising up of short-term for meeting shortages of cases and obligations and the temporary deployment of excess funds for earning returns. The major participants in the money market are the RBI and commercial banks. The broad objectives of the money market are to provide.

- An equilibrating mechanism for evening out short-term surpluses and deficiencies, as a matter of monetary policy.
- A focal point of RBI intervention for influencing liquidity in the economy.
- A reasonable access to the users of short-term funds to meet their requirements at realistic/reasonable price/cost.

The Indian money market was under developed till the eighties. The post-1990 period has witnessed significant developments. Its present structure comprises a number of interrelated sub-markets, that is, call market, treasury bills market, commercial bills market, commercial papers (CPs) market, certificate of deposits (CDs) market, and money market mutual funds (MMMFs). The institutional structure of the market has been fortified by the setting up of Primary Dealers and Satellite Dealers. An articulate money market has emerged in the country in the context of the

deregulated economic environment and there are indications of its close integration with the forex market.

5.3.3. Capital Market

It is a market for long term funds. Its focus is on financing of fixed investments in contrast to money market which is the institutional source of working capital finance. The main participants in the capital market are mutual funds, insurance organizations, development/public financial institutions, foreign institutional investors, corporates and individuals. It is regulated by the SEBI. The capital/securities market has two segments : (i) Primary/New issue market and (ii) Secondary market/stock exchanges/markets.

5.3.4. Major Financial Institutions/Intermediaries

The second constituent of the financial system comprises the financial institutions/intermediaries (FIs). In contrast to the financial markets, the FIs are institutional sources of finance to industry. They act as a link between the savers and the investors which result in *institutionalization* of personal savings. Their main function is to convert direct assets/instruments/securities issued by corporates into indirect securities. Then direct securities offer to the individual investor's better investments alternatives than the direct/primary security by pooling which it is created, for example, units of mutual funds, bank deposits, insurance policies and so on.

With the growth of a mutual and sophisticated financial system in the counter over the last five decades, a diversified structure of FIs has emerged. For details see chapter 1.

5.4 Non-banking Financial Companies (NBFCs)

They provide a variety of fund/asset based and non-fund based/advisory services. Most of their funds are raised in the form of public deposits ranging from one year to three years of maturity. Depending on the nature and type of service provided, they are categorized into :

- Leasing companies
- Hire purchase and consumer finance companies
- Housing finance companies
- Merchant banking
- Factoring services.

5.5 Development/Public Financial Institutions (DFIs/PFIs)

As an integral part of the broad strategy of planned economic development, a battery of DFIs has come into being as a result of state sponsoring. The present structure consists of (i) some national/all-India institutions, namely, IFCI Ltd., ICICI Ltd., IDBI, SIDBI and Industrial Investment Bank of India (IIBI) Ltd. and (ii) regional/state level institutions, namely, SFCs, SIDCs, State Industrial Investment Corporation (SIIs) and institutions, namely, SFCs, SIDCs, State Industrial Investment Corporation (SIIs) and TCOs. The all-India DFIs like ICICI and IDBI have left the field recently as a result of the financial reforms introduced since 1991.

Mutual Funds

A mutual fund (MF) is a special type of investment institution which acts as an investment conduit. It pools the savings of relatively small investors and invests them in a well diversified portfolio of sound investment, thus enabling them to participate indirectly in the benefits of investment in industrial securities. As an investment intermediary, it offers a variety of services/advantages to small investors such as diversification of portfolio and consequent reduction in risk, expert professional management, and liquidity of investment, tax shelter and reduced cost.

The Indian capital market has witnessed in the post 1990 period the emergence of a diversified structure of MFs. The preset structure consists of the Unit Trust of India which was set up as a public sector institution in 1964 and other MFs sponsored by bank subsidiaries, LIC and GIC, private corporates/financial institutions and foreign institutional investors. Currently, MFs represent a notable intermediary in the Indian capital market.

5.6 Questions

1. Distinguish between primary and secondary stock market.
2. Define organized sector of the financial system.
3. List down two components of organized sector of the financial system.
4. What do you understand by unorganized sector of the financial system ?
5. List down two components of unorganized sector of the financial system.

Unit 6 □ Stock Market Analysis : Fundamental and Technical Analysis

Structure

- 6.1 Introduction**
- 6.2 Growth Rate of Dividend**
- 6.3 Pricing of Shares**
- 6.4 Conclusive Remarks**
- 6.5 Technical Analysis**
- 6.6 Types of Charts**
- 6.7 Basis of Technical Analysis**
- 6.8 The Dow Theory**
- 6.9 Market Indicators**
- 6.10 Support and Resistance Levels**
- 6.11 Moving Averages**
- 6.12 Model Questions**
- 6.13 References**

6.1 Introduction

Fundamental Analysis

Even when everybody in company sleeps, the machines do not roll down, no amount of laughing or smiling, no amount of sweating or sneezing take place, the share of a company continues to be influenced by the invisible parameters and actually change silently. This factor needs a thorough analysis of the stocks and understanding of the factors that affect the process of value creation and value drop for a company. A company is considered fundamentally strong if it can continue in growth even when the market goes the other way or when the possibilities of losing the elan vital in the face of direct impact of the external factors occur whether it can fight that out or not. Fundamental is the very basic thing of the company. It is like the health of a person. If the fundamental is strong then the person can avert the impact of adverse things in life. It is also obvious that the fundamental of a company spells around the capacity of it to produce results and face the challenges of the market and other factors. That means fundamentals of a company talks about the amount of return and risk a

company stands for. While maintaining the health of a company, as also in its efforts to grow, the long term and short term agenda a company undertakes makes it susceptible to the forces of change and the value drivers across.

Fundamental analysis is based on the belief that the price of a share is based on the benefits the holders of the share expect to receive in the future. Investors do expect two types of gains from the company in the market. These are :

Dividend yield and Capital gain

Dividend yield is calculated as the amount of dividend paid with respect to the price of a share and the capital gain is the measure of the gain a share can make in the event of the rise of the share price in the market through the trading process. If a person invests in a share now he expects some amount of dividend at the end of the financial reporting period. On the other hand a share invested in creates an expectation to foster the returns from the market. It is normally through a process of the trading activities and the process of value creation that a person gets her expectations honored. Whereas the capital gains occur in the current period, the dividend yield can be estimated on a stream of expected future income from dividends to be paid by the company in the future. This is done by estimating the amount of dividend expected from a company in future period of time. Considering the future dividends as the expected stream of cash flows, the calculation is done using the concept of the time value of money. The future stream of expected cash flows is discounted using a proper discounting factor and then the average per period of the same is computed to get the absolute amount of dividend expected out of the investment. The amount of dividend that works out thus is compared against the average price of a share to get the most expected value of the dividend yield.

The present value of future dividends, computed at an appropriate discount rate reflects the risk of the share. Amount of return that works out as against the amount of risk it contains is the measure of the relative gain on a share. Investors are interested to see the return as a factor of the risk contained. This value that is available by and large from the activities of a company is considered intrinsic or fundamental value of the share. Therefore the fundamental value of a share is directly dependent upon the results and risks of the company. If the company does well its fundamental is supposed to be strong. On the other hand, if it does not do well on profit and other parameters it is supposed to be performing badly in the stock market as well. According to the view of fundamental analysis, a company is supposed to get good prices in the market if its bottom lines are favorable. Value of a share which is reflected from the fundamentals of a company is the fundamental value.

A share that is quoting below the fundamental value should be bought, while a share that is priced above the fundamental value should be sold. The fundamental analysis therefore attempts to find such under or over-priced shares for their investment decisions. They believe that though in the short run, market price may deviate from the fundamental or intrinsic value, in the long run, the price would reflect the fundamental value, justifying thereby the decision made earlier. Since dividends distributed by a firm depend very much on the earnings of the firm, forecasting future dividends necessarily requires analysis of the economic and other relevant factors that influence the financial performance of the firm.

Market Efficiency

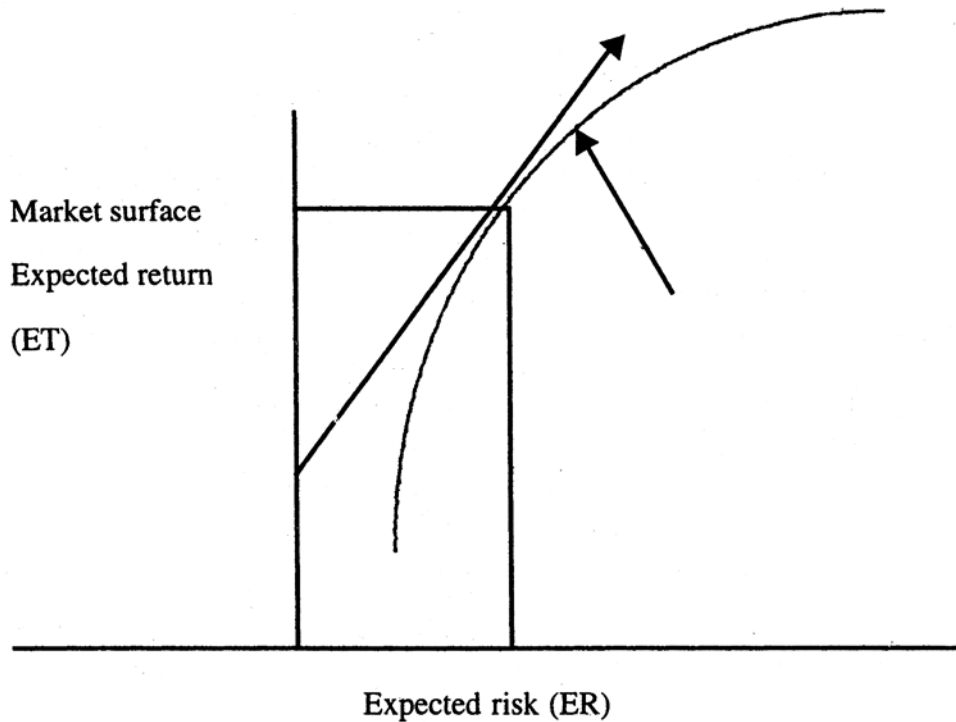
In an efficient market it is believed that the market takes into account all the fundamental facts relating to the financial performance of a firm in pricing a security.

In an efficient market all information is spread to all investors forthwith. It is also believed that all investors process the available information rationally, so that no single investor has an edge over the others. This does not mean that in reality all information is disseminated instantaneously or that the analytical abilities of all investors are equal. Market efficiency merely implies that there are enough experts in the market with reasonably well-developed communication channels, so that if there were any special information or scientific formula for making excess returns, it would soon be discovered by many, so that the advantage or superior knowledge or analysis if any, will soon be dissipated. Therefore individual differences on the power of information processing and utility will be either minimum or nil.

If the prevailing price of a security is higher than the estimated fundamental value (i.e. if the security appears to be overpriced), they recommend a selling strategy with respect to that security, since once the information becomes common knowledge, the price of the security may be expected to fall. On the other hand, if the security is underpriced in the market, the prevailing price (or the P/E multiple) of the security being lower than the estimated fundamental value, the experts recommend buying the security, expecting a price rise. In an efficient market the companies are expected to gather strength out of the market mechanism and the market process. Free movement of information and the matching ability to make use of that make the operators all equally competent to handle the issues related to the prices and the values of the market. That is, there is perfect competition.

From the above diagram we can calculate the market price of risk as follows :

$$\text{Market Price of Risk (MPR)} = [ET - RfR] / ER$$



Where RfR stands for the risk of the investment, measured through the process of forecasting and estimation of future outcomes. ER is the expected risk corresponding to the span of return as measured through the process of investment on a particular position of the curve in the market. The return in excess of the risk free return is important here. Investors are interested to know how much more they can earn through investment in the market instrument chosen. In this particular example, time period for the measure of the risk as also the returns are the same. One has to understand the implications of making an investment in the market instrument concerned and make investments thereafter. Market price of risk gives an important idea about the relative importance of the return from a stock in the face of the risks that it might generate for the said investment. Market price of risk varies from one market to the other. This is dependent upon the risk free rate of return on one hand and the capacity of a market to help a stock generate adequate return to satisfy the investors. A market with high market price of risk helps the investors gain better income than the other one with low MPR.

6.2 Growth Rate of Dividend

In order to get a proper idea about the expected return from the stock one has to develop realistic idea about the dividend income from the company. Dividend income is important for those shares which sell in the market sufficiently close to the average price level of the share. However if the market price of a share is far beyond the book price dividend becomes insignificant to the investors in all probability. To take an example, if the market price of a share with rupees ten as book value is eight hundred rupees, the announcement of a ten percent, twenty percent or thirty percent makes hardly any difference to the perception of the investor. Whereas the same having a market price around fifteen or twenty rupees makes strong sense of attractions to the investor. This analysis shows that shares are dividend-sensitive if the average market prices are sufficiently close to the book price of the share. For the last category, calculating the growth rate becomes essential.

In order to assess the growth rate of dividend (g) for a company one generally resorts to the historical data of the company, and in the absence of any special information, assumes that the past growth rate in dividends will continue in future too. If there are reasons to believe that this is unlikely to be so, a different assumption would be called for.

If we have historical data on dividends from period t through T , one way to estimate g may be as follows :

$$g (\%) = [D(T)/D(t)] * 100$$

Where $D(T)$ and $D(t)$ are the DPS in period T and t respectively.

If may be observed that the value of g computed as above depends solely on two amounts of dividends; that of the base year, t and that of the final year, T . If the growth rate over the years is more or less uniform, this method yields a fairly acceptable estimate of g . If, however, either of those years is abnormal for various reasons, the growth rate thus obtained can hardly be taken as being representative of all the intervening years.

While the above approach takes into account the dividends of all the years, the procedure suffers from the handicap of being swayed by extreme values. For example a single year with too high or too low a dividend can bias the average growth rate in either direction.

To get over this problem, one may use regression techniques, for estimating g , which also takes into account the dividends information of all the periods under observation.

It is essential to note that in estimating g over a period of time, the stream of dividends per share should be adjusted for the bonus issues and rights issues, if any, made during the period.

6.3 Pricing of Shares

It has been said earlier that the price of a share may be said to depend upon the future earnings stream and the expected rate of return of the shareholders. If so, any information or news reaching the market will be interpreted by it in terms of their perceived impact on the future financial performance of a firm. If the market expects the news to result in an increased future expected benefits for the firm's shareholders or leave them unchanged or reduce them, the price the market is prepared to pay for the firm's share goes up, or remains unchanged or goes down respectively.

Not all information may be of equal relevance to all securities. Some of the information may be relevant only for a particular company, while other information may be relevant for the entire industry or even the market as a whole.

Information affecting the industry or economy as a whole may be concerned with changes or expected changes in the government, overall monetary or fiscal policies, balance of payment situation, death of a major leader, a major war, monsoons, and such other macro economic and political factors. Changes in such factors would thus buoy up or depress the capital market as a whole, rather than affect any particular industry or company security. This is because such factors bring about a rather wholesale change in the expectations of future benefits from the entire industrial sector in general.

In the final analysis, all market information is essentially reduced to the market's assessment of merely two fundamental parameters, viz. the expected future growth rate of dividends and the expected returns of the shareholders. And this is what the fundamental about a company; we estimate the fundamental value of the share of a company assuming that the past pattern of dividend growth rate will continue to prevail in future. But if we do have other information to the contrary, the future earnings of the company or its dividend growth rate may have to be forecast taking all such information into account. Basically, it is expectation about future course of dividends and future course of capital appreciation or depreciation that determines present share prices.

6.4 Conclusive Remarks

The finance theory does not believe that in an efficient capital market, the fundamental approach, or for that matter any other approach, can help anybody out-perform the market consistently. In fact, there is no conclusive evidence, in India and elsewhere, that fundamental analysts out-perform any randomly selected well diversified portfolio over a long investment horizon. This is because notwithstanding the short-term random changes in the share prices, in the long run, prices of all securities ought to hover around their fundamental values. The share price level itself is linked with the basic performance of the real sector of the economy.

In practice, however, it is observed that the market prices often deviate significantly from the fundamentals. This is because many of the assumptions made in assessing the fundamental value of a share may not obtain in reality. Further, for reasons of temporary imbalance in the demand and supply of securities money, market moods, economic conditions, new investment opportunities, monsoon conditions, corporate performance, speculation, labour conditions, and insider trading and a host of other reasons, the actual prices of securities may take long excursions from their fundamentals.

The fundamental analysis, however, believes that by identifying and processing relevant information 'correctly' and quickly (as compared to the market as a whole), they can predict the share price movements faster than the market, and gain that short-lived edge over others.

6.5 Technical Analysis

Whereas the fundamental analysis helps the investor to understand the basic factors, true implications of current results and potentials for the future, the technical analysis talks about the performance indicators with respect to the market parameters or corresponding to the relevant parameters. Technical analysis is basically based on the statistical and mathematical tools that help to track with the historical data and finding the way towards identifying corresponding data for the future. It also aims at identifying the parameters that are relevant to the same set of outcomes. In the long run, the psychological factors of investment play a superior role than the economic or market specific factors. If we study the past behaviour of investors with respect to a particular stock, we get a fairly good picture about the mood and its derivatives as may be applicable in the future.

Fundamental analysis helps us in computing the intrinsic value of a firm's share. As the uncertainty associated with these factors is high, in the short run, the prices may deviate considerably from the intrinsic value. Investors are not prepared to wait to realize the predicted long-term benefits holding the share. The argument used by technical analysis to justify is that the share prices more often than not are governed by psychological factors, than by economic considerations. If this is indeed true, then an analysis of the past prices and the market index would help in understanding the psychology of investors so as to predict the emerging market mood in the short run, and stay the proverbial step ahead of the crowd.

Technical analyst attempts precisely that. The two basic questions that he seeks to answer are : (i) is there a predictable trend in the prices ? (ii) If at all, then are there indications that the trend would continue or reverse ? The methods used to answer these questions are visual and statistical. The visual methods are based on examination of a variety of charts to make out patterns, while the statistical procedures analyze price and return data to make trading decisions. It cannot be said however that technical analysis can always predict better than fundamental analysis.

6.6 Types of Charts

Technical analysis, by and large, uses three types of charts :

- Line chart
- Bar chart
- Point and figure chart.

In a line chart, the closing price for each period is plotted as a point. These points are joined by a line to form the chart. The period may be a day, a week or month. In a bar chart, a vertical line (bar) represents the lowest to the highest price, with a short horizontal line drawn from the bar representing the closing price for the period. Since volume and price data are often interpreted together, it is a common practice to plot the volume traded, immediately below the line and the bar charts.

The charts may be plotted using either arithmetic or a logarithmic scale. On an arithmetic scale, the same distance is used for each unit of change in price. That is, price change from 20 to 30 and from 30 to 40 would be shown by identical distances. On a logarithmic scale, prices are plotted in such a way that same percentage changes are shown by identical distances. Debates among technical analysts exist regarding superiority of scale for decision making.

The major drawback of the chart is that it provides no clue about the time when the changes takes place. Charts are useful only when used in conjunction with the bar and the line charts.

6.7 Basis of Technical Analysis

Based on the collective experience of the rational investors the techniques of technical analysis have been drafted and collated into some kinds of general principles and methods of analysis that are useful for trading in the stock market. Some of these tools are discussed hereunder.

6.8 The Dow Theory

One of the oldest and perhaps the most important technical theory is known as the Dow Theory. It is based in the principles developed in late nineteenth century by Charles Dow, the founder of the Dow Jones and Co. Dow observed that most shares move in along the market, going up when the market goes up and coming down when the market comes down. Therefore, it is required to first understand the behaviour of the market as a whole. In order to accomplish that, he constructed two indices, calling them the Industrial Average named after him as Dow Jones Industrial Average (DJIA) and the Rail Average, later on named after him as Dow Jones Transportation Average (DJTA). These averages were considered to reflect the aggregate impact of all kinds of information and influences on the market.

Dow postulated that the averages would show three kinds of trends as follows :

- the primary trend.
- the secondary reactions
- the minor trends

Dow had compared them with the tides, the waves and the ripples in the ocean.

Dow proposed that the primary upward trend would have three moves up, the first one caused by accumulation of shares by the long term and knowledgeable investors, the second move would be fostered by the arrival of the first reports of good earnings by corporations, and the third move up would be caused by wide spread report of financial well-being of corporations. In the third stage wide speculation shall set in the market. Towards the end of the third stage, the long term investors, realizing that the high earnings levels may not be sustained, would start selling, starting the first move

down of a downtrend, and as the non-sustainability of high earnings is confirmed, the second move down would be initiated and then the third move down would result from distress selling in the market. A trend remains effective until a reversal is indicated and confirmed by the behaviour of both the averages. The start of a bullish trend is signaled when both the averages cross the high achieved in the previous secondary reactions to the basic downtrend, while a bearish trend begins when both averages drop below the previous low reached during the secondary reaction to a basic uptrend.

The 30-share BSE Sensex in India could be considered a close comparison of DJIA though the contents of the index vary widely.

6.9 Market Indicators

Volume of transactions is a major indicator of the performance of a market. If it is analyzed in association with the index or prices, it can provide effective ideas on how the market would behave in the near future. When the index/price rises along with increasing volume it signals a **buy** because the situation reflects an unsatisfied demand in the market. When the market runs in the opposite manner it is a case of **sale**. Similarly, when the market falls with increasing volume, it signals a **bear** market and the prices would be expected to fall in future. A rising market with decreasing volume indicates a **bull** market that is running out of steam, while a falling market with dwindling volume indicates a bear market that is becoming weaker. Thus, by combining the index/price and the volume data, a suitable **trading strategy** can be formed. Stock exchanges provide the data about the volume of transactions and the prices registered thereupon. With these data made available, it is possible to analyze the index and prices and finally take up sale/purchase decisions.

Difference between the number of securities advancing and declining in price is another breadth indicator. This is used quite often by the analysts. The value for each period, as also the cumulative value over time, is a good indicator of how wide-spread has been the rally or the decline in the market. The cumulative value may be plotted to get the **growth-decline curve**. This curve can be interpreted in conjunction with the index to get a good idea about the **market trends** with respect to the share. A rising index with a falling growth-decline line would be a bearish signal, while a falling index with rising growth-decline line would be a bullish signal. Stock markets provide daily price data on a large number of shares online making it easy to build software to compute and plot these indicators.

The Indian capital market has a system for **carrying forward transactions** from one settlement period to another by payment of what is known as the **badla** charge. This charge may be considered as the interest paid by buyers or sellers for not taking delivery of shares bought. When the *badla* rates become very high (upward of 30% per annum), stock prices decline. This is because at such high rates it would be uneconomical to sustain a buyer position in the market.

Persistent backwardation, which is opposite *badla* is charge paid by sellers to buyers, indicates a shortage of stocks in the market. This signals a rise in prices in the near future and seller would buy back stock to square out their position. Thus, the *badla* rates for the specified security prove a useful indicator of the market behaviour in the near future. But the badla transactions have recently been banned.

6.10 Support and Resistance Levels

The concepts of support level and resistance level are very common among the investors. When the index/price goes down from a peak very consistently, the peak becomes the **resistance level**. When the index/price rebounds after reaching a trough subsequently the lowest value reached becomes the **support level**. Generally stock prices move between these two levels. Selling trend is high when the prices reach resistance level and buying trend is high when this reaches the support level. Whenever the price approaches the resistance level, there is a selling pressure because investors who failed to sell at the high would be keen to liquidate, while whenever the price approaches the support level, there is a buying pressure as all those investors who failed to buy at the lowest prices would like to purchase the share.

Price Trends

Price trends can be understood through charting methods. Various types of charts can be developed. The usual and important ones are :

- CHANNEL
- WEDGE
- TRIANGLE
- FLAG
- HEAD AND SHOULDERS
- GAP

Channel

Channel is said to be formed when a series of uniformly changing tops and bottoms give rise to a formation. In this pattern the support and resistance change in identical directions and are constant over time. The direction of the slope of the channel indicates which way the market is going to move in the future. A downward sloping channel would indicate declining prices and an upward sloping channel would imply rising prices. If the price breaks through the channel boundaries, then a definite change in the market sentiment is indicated. Prices may start rising or falling depending on whether the upper boundary or the lowest boundary is violated.

Wedge

A wedge is formed when the resistance levels and support levels change in opposite direction or when they are changing in the same direction at different rates over time. Therefore, a wedge is nothing but a channel whose top and bottom boundaries instead of being parallel are converging. The slope of the wedge again indicates the general direction of movement of prices. Changes in the boundaries are indicative of a definite direction in the market sentiment and price trends.

Triangle

This is kind of wedge where the top and the bottom boundaries intersect to form a triangle. A breakout from a triangle is supposed to be a very strong indication of the prices. A triangle may be formed based on some information about the scrip in the market. The convergence of the top and the bottom boundaries indicates a continuous reduction in the uncertainty which was there in the beginning. The intersection indicates a reduction in uncertainty.

Flag

Flag is a formation of steep rise in the price, followed by wide, uniform fluctuations around an average price. Continuity sets the trend of price movements. A plausible explanation for formation of a flag is as follows : some news about the scrip triggers the initial rise in price. Subsequently, the market goes through a process of verification and assimilation of the news. The fluctuating prices indicate a great disagreement about the magnitude of the impact on the share prices. A series of flags in a rising market are a sign that the market may not decline very sharply. Similarly, a series of flags in a falling market would indicate that the prices may not rise quickly, because the market has time to absorb the drop in price.

Head and Shoulders

This is a distorted drawing of human form, with a large hump that looks like a head in the middle of two smaller humps which looks like shoulders. This is perhaps the single most important pattern to indicate a reversal of price trend. The neckline of the pattern is formed by joining points where the head and the shoulders meet. The price movement after the formation of the second shoulder is crucial. If the price goes below the neckline, then a drop in price is indicated, with the drop expected to be equal to the distance between the top of the head and the neckline. As far as possible, the neckline should be horizontal; a slight incline in the neckline is acceptable.

The humps could be generated by buying pressures. However, at the peak of each hump a selling pressure leads to decline in prices. If the price goes down after the process is repeated three times, then a clear lack of demand for the scrip is expected. An inverted head and shoulders formation in a falling is to be interpreted on the same lines. If the price line intersects the neckline after the second inverted shoulder is formed, it is an indication that the price would rise.

Gap

Gap is the difference between the opening price on a trading day and the closing price of the previous trading day. Wider the gap, stronger is the signal for a continuation of the observed trend. On a rising market, if the opening price is considerably higher than the previous closing price, it indicates that investors are willing to pay a much higher price to acquire the scrip.

Analysis of data

Stock analysis is mostly done based on simple statistical analysis of price data. These rules along with the price patterns form the set of tools used for trading in the market. Some of the methods of data analysis for decision making are as follows:

6.11 Moving Averages

Two types of moving averages are normally used in the context of the stock markets. These are:

- Arithmetic Moving Average (AMA)
- Exponential Moving Average (EMA)

These are done following the usual rules of mathematics. Sometimes, multiple moving average are used to make trading decisions. A buy signal is indicated when the

shorter-term moving average crosses the longer-term moving average from below, and a sell signal is indicated when the opposite happens. The shorter-term moving average is much more sensitive to price changes.

An investor with a long holding period may use a 100-day moving average for her decisions, while an investor with very short holding period may use a 7-day moving average. This is consistent with the fact that in case of violent price fluctuations, shorter-term moving average would induce larger number of transactions. It is also a common practice to use multiple moving averages and put through a transaction only if identical signals are given by several moving averages.

Filter rules

Filter rules, many a time, define the mechanical trading rules which comprise computerized trading schemes. A 1% filter implies that a downtrend is indicated as soon as a stock moves down by 1% from the most recent peak, and uptrend is indicated whenever a stock moves up by 1% from the most recent low point.

It is clear that smaller filters are likely to result in larger number of transactions and therefore larger transaction costs. In general, these rules can be effectively used in the market only if the transaction costs are very low.

6.12 Questions

1. Discuss the scope of the fundamental analysis for selecting a share.
2. What do you understand by the market price of risk? How can this be used to select a share for buying/selling?
3. Explain how the growth rate of dividends affects the price of a share.
4. Discuss the Charting techniques for technical analysis.
5. What is the Dow Theory? How does it help in finding out the trends of price movements of a share?
6. Explain the situations that lead to a upward Channel formation.
7. What does the Head and Shoulder pattern indicate with respect to the price of a share?

Short-answer Questions

9. A company has paid no dividends for two successive years and its share price is rising. Can you say why?
10. Can falling interest rates boost share prices?
11. What would be the impact of falling corporate profits on share prices?

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Unit 7 □ Efficient Market Theory

Structure

- 7.1 Introduction**
- 7.2 Degrees of Efficiency**
- 7.3 Types of Efficiency**
- 7.4 Weak Efficiency**
- 7.5 Filter Rule**
- 7.6 Semi Strong form**
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7.1 Introduction

The efficient market hypothesis (EMH) holds that a stock market is efficient if the market price of a company's shares or other financial securities rapidly and correctly reflects all relevant information as it becomes available. Therefore in an efficient stock market, share prices can always be relied upon to correctly reflect the true economic worth of the shares. In such a market, over or under-valued shares would not exist.

The concept of an efficient market and the degree to which the market actually is efficient is of prime importance due to various reasons, such as:

- correct valuation of the company's shares
- correct choice of shares by the investors to achieve highest economic gains
- proper assessment of the market capitalization
- Proper pricing of the risk of a share.

Efficient Market Hypothesis is an idea partly developed in the 1960s by Eugene Fama. It states that it is impossible to beat the market because prices already incorporate and reflect all relevant information. This is a highly controversial and often

disputed opinion. Supporters of this model believe it is pointless to search for undervalued stocks or try to predict trends in the market through any technique (fundamental or technical analysis).

Under the efficient market hypothesis, any time you buy and sell securities, you're engaging in a game of chance, not skill. If markets are efficient and current, it means that prices always reflect all information, so there are no way you'll ever be able to buy a stock at a bargain price.

This theory has met with a lot of opposition, especially from the technical analysts. Their argument against the efficient market theory is that many investors base their expectations on past prices, past earnings, track records, and other indicators. Since stock prices are largely based on investor expectation, many believe it only makes sense to believe that past prices do influence future prices.

The term *efficiency* can refer to either type or degree.

7.2 Degrees of Efficiency

Efficiency can be divided into three different degrees or levels:

- Weak efficiency
- Semi-strong efficiency
- Strong efficiency

Strong efficiency implies that the share prices reflect all relevant information about their value, even though some of that information may not have been publicly disclosed.

7.3 Types of Efficiency

There are two types of efficiency

- operational efficiency
- Informational efficiency.

Operational efficiency is a measure of how well things move in terms of speedy execution and accuracy. Stock exchanges measure operational efficiency by factors such as the number of orders lost or filled incorrectly and the elapsed time between the receipt of an order and its execution. All market participants are concerned with these matters, but the EMH does not refer to this type of efficiency.

Information efficiency is a measure of how quickly and accurately the market reacts to new information or potentially new information. New data constantly enter the marketplace via economic reports, company announcements, political activities or public opinion surveys, etc. What does all these information mean? Security prices have a tendency to adjust rapidly and accurately to news. Sometimes the speed of adjustment is remarkably fast. In an informational efficient market, prices react fast. Because the market is efficient, it discerns the meaning of the news quickly, and prices adjust. The market process of an efficient market leads to the understanding of the investors and the trade in the following terms:

- Investors are rational, and they value securities in a rational manner
- To the extent that investors are not rational, they trade randomly, so irrationalities tend to cancel each other out
- To the extent that investors are not randomly irrational, they are met in the marketplace by rational arbitrageurs, who eliminate any remaining irrational pricing elements.

7.4 Weak Efficiency

Weak efficiency is the lowest level of efficiency. It implies no more than that share prices fully reflect any information that may be obtained from studying and analyzing past movements in the share price.

The least restrictive form of the EMH is weak efficiency, which states that you cannot accurately predict future stock prices by analyzing prices from the past. In other words, charts are of no use in predicting future prices.

According to the weak form of the EMH, how a stock arrived at its current level of prices is irrelevant. It could have followed any of the available routes to reach the current stage. The only thing that matters is the current price. Any information contained in the past price series is already included in the current price.

Autocorrelation tests are suggested in the finance literature for the justification of the test of efficiency. The classic study is an exhaustive one by Eugene Farma. Farma is the pioneer contributor to and innovator of the entire notion of market efficiency.

7.5 Filter rule

A filter rule is a trading rule that involves buying shares after they rise in value by x percent. When they fall x Percent from the subsequent high, sell them, go short,

and cover the short when they rise x percent from a subsequent low. Because anyone can calculate these realized percentages, filter rules should not work if the markets are weak from efficient

Fama and many others have examined the performance of filter rules. The results are similar to those of the autocorrelation tests. Occasionally one or two successful filters could be found, but they still prove uneconomic when the effect of transaction costs is included.

7.6 Semi strong form

Semi strong efficiency is the next level up of efficiency. This implies that share prices fully reflect all the relevant publicly disclosed information that is known about the company and its circumstances.

The weak form of the EMH states that security prices fully reflect any information contained in the past series of stock prices. Semi strong form efficiency takes the information set a step further and includes all publicly available information. The semi strong form of the EMH states that security prices fully reflect all relevant publicly available information.

Large mass of information holds potential interest to investors. In addition to past stock prices, economic reports, brokerage firm recommendations, investment advisory letters and so on all contain a myriad of details about what affects business performance and stock value. Although no one sees every one of these items, the market does, and prices move as people make decisions to buy and sell based on what they learn from the information set available to them.

7.7 Tests of semi strong Efficiency

Results of various researches support the semi strong version of the efficient market hypothesis. The literature devotes much more attention to tests of semi strong form efficiency than to weak form tests. Studies have investigated the extent to which people can profit by acting on various corporate announcements such as stock splits cash dividends, and stock dividends. While an occasional research paper shows that small profits could have been made in a particular case, the general result is consistent. The market reacts to public information efficiently, and investors will seldom outperform the market averages by analyzing public news, especially if they are taxpayers and pay commissions when they trade.

Study by Ball and Brown deals with the market's reaction to corporate earnings announcements. This research reported that stock prices react favourably to better-than-expected earnings, and vice versa. However, they also reported that security prices seemed to anticipate the news as much as a year prior to the announcement and that by the time the actual earnings were made public an investor had little opportunity to capitalize on the news.

7.7.1 The Risk-Return Trade-off

Trade-off implies a kind of compromise.

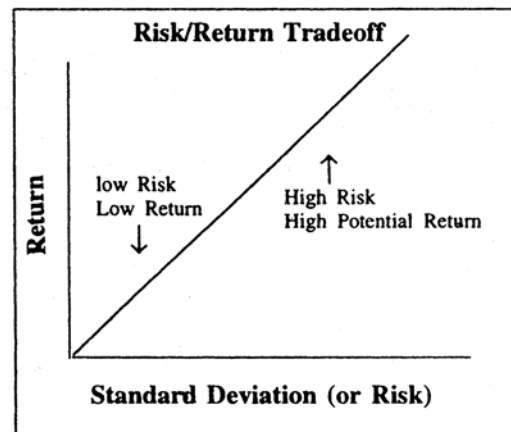
The risk-return trade-off could easily be called the "ability-to-sleep-at-night test." While some people can handle the equivalent of financial skydiving without batting an eye, others are terrified to climb the financial ladder without a secure harness. Deciding what amount of risk you can take while remaining comfortable with your investments is very important.

In the investment world, the dictionary definition of risk is the chance that an investment's actual return will be different from the expected. Technically, this is measured in statistics by standard deviation. Risk means you have the possibility of losing some or even all of our original investment.

Low levels of uncertainty (low risk) are generally associated with low potential returns. High levels of uncertainty (high risk) are associated with high potential returns. The risk/return tradeoff is the balance between the desire for the lowest possible risk and the highest possible return that is, between minimum risk and maximum return. This is demonstrated graphically in the chart below. A higher standard deviation means a higher risk and higher possible return.

A common misconception is that high risk equals high return. The risk return tradeoff tells us that the high risk gives us the possibility of higher returns. There are no guarantees. Just as risk means higher potential returns, it also means higher potential losses.

On the lower end of the scale, the risk-free rate of return is represented by the return on U. S. Government Securities because their chance of default is next to nothing. If the risk-free rate is currently 6%, this means, with virtually no risk, we can earn 6% per year on our money. Some is the case with Government of India securities in India.



The common question arises: who wants 6% when Index funds average 12% per year over the long run? The answer to this is that even the entire market (represented by the Index fund) carries risk. The return on Index funds is not 12% every year, but rather -5% one year, 25% the next year, and so on. An investor still faces substantial greater risk and volatility to get an overall return that is higher than a predictable government security. We call this additional return the risk premium, which in this case is 6% (12%-6%). Risk tolerance differs from person to person. It depends on goals, income, personal situation, etc.

7.7.2 Diversification

Many individual investors can't tolerate the short-term fluctuations in the stock market. Diversifying your portfolio is the best way to smooth out the ride.

Diversification is a risk-management technique that mixes a wide variety of investments within a portfolio in order to minimize the impact that any one security will have on the overall performance of the portfolio.

Diversification lowers the risk of your portfolio. Academics have complex formulas to demonstrate how this works, but we can explain it clearly with an example:

Say you live on an island where the entire economy consists of only two companies: one sells umbrellas while the other sells sunscreen. If you invest your entire portfolio in the company that sells umbrellas, you'll have strong performance during the rainy season, but poor performance when it's sunny outside. The reverse occurs with the sunscreen company, the alternative investment: your portfolio will be high performance when the sun is out, it will tank when the clouds roll in. Chances are you'd rather have constant, steady returns. The solution is to invest 50% in one company and 50% in the other. Since you have diversified your portfolio, you will get decent performance year round instead of, depending on the season, having either excellent or terrible performance.

There are three main practices that can help you ensure the best diversification :

1. Spread your portfolio among multiple investment vehicles such as cash (zero risk zero return) stocks, bonds, and perhaps even some real estate.
2. Vary the risk in your securities. You're not restricted to choosing only blue chip stocks. In fact, it would be wise to pick investments with varied risk levels; this will ensure that large losses are offset by profits in other areas.
3. Vary your securities by industry. This will minimize the impact of specific risks of certain industries.

Units of mutual fund ensure diversification indirectly.

Diversification is the most important component in helping you reach your longrange financial goals while minimizing your risk. At the same time, diversification is not an Ironclad guarantee against loss. No matter how much diversification you employ, investing involves taking on some sort of risk.

Another question frequently baffles investors: how many stocks should be bought in order to reach optimal diversification? According to portfolio theorists, after around 20 securities, you have reduced almost all of the individual security risk in a portfolio. This assumes you buy stocks of different sizes from various industries.

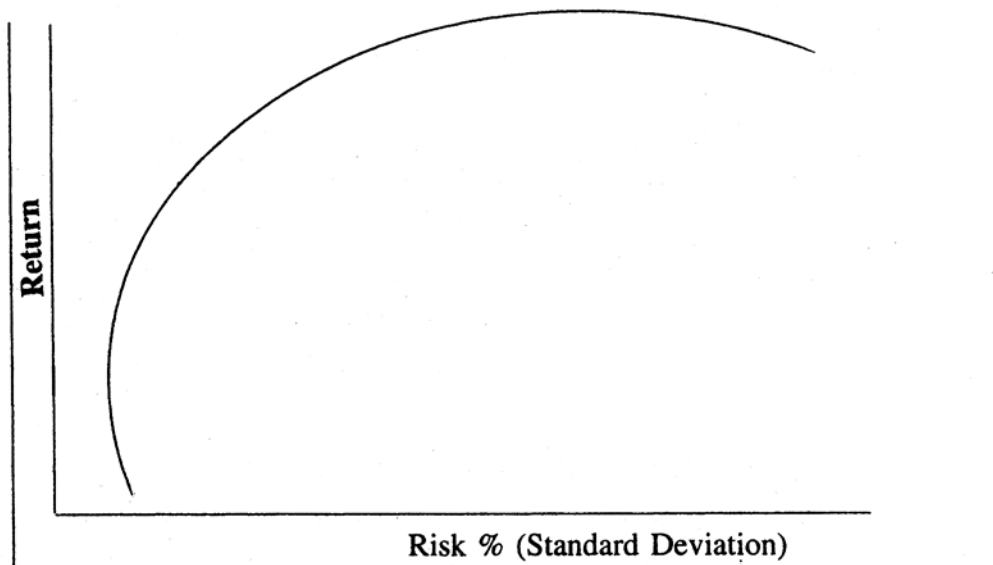
7.7.3 Efficiency through Random Walk :

Random Walk Theory gained popularity in 1973 when Burton Malkiel wrote A Random Walk Down Wall Street, a book that is now regarded as an investment classic. Random walk is a stock market theory that states that the past movement or direction of the price of a stock or overall market cannot be used to predict its future movement. Originally stated by Maurice Kendall in 1953, the theory states that stock price fluctuations are independent of each other and have the same probability distribution, but, over a period of time, prices maintain an upward trend.

In short, random walk says that stocks take a random and unpredictable path. The chance of a stock's future price going up is the same as it going down. A follower of random walk believes it is impossible to outperform the market without assuming additional risk. In his book, Malkiel preaches that both technical analysis and fundamental analysis are largely as waste of time and are still unproven in practice.

Malkiel constantly states that a long-term buy-and-hold strategy is the best and that individuals should not attempt to time the markets. Attempts based on technical, fundamental, or any other analysis, are futile. He backs this up with statistics showing that most mutual funds fail to beat benchmark averages like the S & P 500.

While many still follow the preaching of Malkiel, others believe that the investment landscape is very different than it was when Malkiel wrote his book, nearly 30 years ago. Today, everyone has easy and fast access to relevant news and stock quotes. Investing is no longer a game for the privileged. Random walk has never been a popular concept with those on Dalal Street or Wall Street, probably because it condemns analysis and stock picking, the foundation of Wall Street.



The Optimal Portfolio

The theory of Optimal Portfolio assumes (among other things) that investors fanatically try to minimize risk while striving for the highest return possible. The theory states that investors will act rationally, always making decisions aimed at maximizing their return for an acceptable level of risk.

The optimal portfolio was used in 1952 by Harry Markowitz, and it shows us that it is possible for different portfolios to have varying levels of risk and return. Each investor must decide how much risk they can handle and then allocate (or diversify) their portfolio according to this decision.

The chart is a graphical example of how the optimal portfolio works. The optimal-risk portfolio is usually determined to be somewhere in the middle of the curve because, as you go higher up the curve, you take on proportionately more risk for a lower incremental return. On the other end, low risk/low return portfolios are pointless because you can achieve a similar return by investing in risk-free assets, like government securities.

Investor can choose how much volatility you are willing to bear in your portfolio by picking any other point that falls on the "efficient frontier." This will give you the maximum return for the amount of risk you wish to accept. For a given risk level, there way be different levels of return. Optimizing your portfolio is not something you can calculate in your head. There are computer programs that are dedicated to

determining optimal portfolios by estimating hundreds (and sometimes thousands) of different expected returns for each given amount of risk.

Capital Asset Pricing Model (CAPM)

Pronounced as though it were spelled CAPM, this model was originally developed in 1952 by Harry Markowitz and fine-tuned over a decade later by others, including William Sharpe. CAPM describes the relationship between risk and expected return, and it serves as a model for the pricing of risky securities. CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet our required return, the investment should not be undertaken.

The commonly used formula to describe the CAPM relationship is as follows :

Required (or expected) Return = RF Rate + (Market Return – RF Rate) Beta
Where, Beta = [SD of the stock/SD of the market index] × Correlation Coefficient.

SD stands for the respective standard deviations and correlation coefficient has to be taken between the stock and the market.

For example, let's say that the current risk free-rate is 5%, and the S & P 500 ("the market") is expected to return 12% next year. You are interested in determining the return that ABC Ltd have next year. You have determined that its beta value is 1.9. The overall stock market has a beta of 1.0, so ABC's beta of 1.9 tells us that it is more risky than the overall market; this extra risk means that we should expect a higher potential return than the 12% of the S&P 500. We can calculate this as the following :

$$\text{Required (or expected) Return} = 5\% + (12\% - 5\%) \times 1.9$$

$$\text{Required (or expected) Return} = \mathbf{18.3\%}$$

What CAPM tells us is that ABC's has a required rate of return of 18.3%. So, if you invest in ABC, you should be getting at least 18.3% return on your investment. If You don't think that ABC will produce those kinds of returns for you, then you should consider investing in a different company.

It is important to remember that high-beta shares usually give very high returns. Over a long period of time, however, high beta shares are the worst performers during market declines (bear markets). While you might receive high returns from high beta shares, there is no guarantee that the CAPM return is realized.

7.8 Questions

1. What is the relevance of the study of the EMH to an investor?
2. What are different types of market efficiency?
3. Discuss the implications of a market being efficient.
4. Explain the concept of risk-return tradeoff from the point of view of an investor.
5. How does diversification help in reducing investor risk?
6. With the help of a suitable diagram show how does an efficient market help in deciding on the risk-taking position of an investor?
7. Discuss giving suitable examples the capital asset pricing model.
8. How does the concept of beta help in assigning risk and making decision in a securities market?

Unit 8 □ Overview of Fixed Income Securities-Bond Market Instruments : Government and Corporate Debt Market

Structure

- 8.1 Introduction**
- 8.2 Bond Basics : What are Bonds?**
- 8.3 Debt Versus Equity**
- 8.4 Why Bonds?**
 - 8.4.1 Characteristics of Bonds**
- 8.5 Face Value/Per Value**
- 8.6 Coupon (the interest rate)**
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8.1 Introduction

First thing that comes to most people's minds when they think of investing is the stock market. After all, stocks are rewarding and exciting. The swings in the market

are scrutinized in the newspapers and even covered by local evening newscasts. Stories of investors gaining great wealth in the stock market are common.

Bonds, on the other hand, don't have the same appeal. The lingo seems arcane and confusing to the average person. Plus, bonds are much more boring-especially during raging bull markets, when they seem to offer an insignificant return compared to stocks.

However, all it takes is a bear market to remind investors of the virtues of a bond's safety and stability. In fact, for many investors it makes sense to have at least part of their portfolio invested in bonds which are debt instruments.

8.2 Bond Basics : What are Bonds ?

Just as people need money, so do companies and governments?. A company needs funds to expand into new markets, while governments need money for everything from infrastructure to social programs. When public expenditure target exceeds public revenue accrual, the Government has to meet the gap by borrowing as a matter of fiscal policy. The problem of large organizations run into is that they typically need far more money than the average bank can provide. The solution is to raise money by issuing bonds (or other debt instruments) in a public market. Thousands of investors then each lend a portion of the capital needed. Really, a bond is nothing more than a loan for which you are the lender. The organization that sells a bond is known as the issuer. You can think of a bond as an IOU given by a borrower (the issuer) to a lender (the investor).

Of course, nobody would loan his or her hard-earned money for nothing. The issuer of a bond must pay the investor something extra for the privilege of using his or her money. This "extra" comes in the form of interest payments, which are made at a predetermined rate and schedule. The interest rate is often referred to as the coupon. The date on which the issuer has to repay the amount borrowed (known as face value) is called the maturity date. Bonds are known as fixed-income securities because you know the exact amount of cash you'll get back if you hold the security until maturity.

For example, say you buy a bond with a face value of \$1,000, a coupon of 8%, and a maturity of 10 years. This means you'll receive a total of \$80 ($\$1,000 \times 8\%$) of interest per year for the next 10 years. Actually, because most bonds pay interest semi-annually, you'll receive two payments of \$40 a year for 10 years. When the bond matures after a decade, you'll get your \$1,000 back.

8.3 Debt Versus Equity

Bonds are debt, whereas stocks or shares are equity. This is the important distinction between the two securities. By purchasing equity (stock) an investor becomes an owner in a corporation. Ownership comes with voting rights and the right to share in any future profits. By purchasing debt (bonds) an investor becomes a creditor to the corporation (or government). The primary advantage of being a creditor is that you have a higher claim on assets than shareholders do : that is, in the case of bankruptcy, a bondholder will get paid before a shareholder. However, the bondholder does not share in the profits if a company does well-he or she is entitled only to the principal plus interest.

8.4 Why Bonds ?

It's an investing axiom that stocks return more than bonds. In the past, this has generally been true for time periods of at least 10 years or more. However, this doesn't mean you shouldn't invest in bonds. Bonds are appropriate any time you cannot tolerate the short-term volatility of the stock market. Take two situations where this may be true :

- (1) Retirement—The easiest example to think of is an individual living off a fixed income. A retiree simply cannot afford to lose his/her principal as income for it is required to pay the bills.
- (2) Shorter time horizons—Say a young executive is planning to go back for an executive MBA in three years. It's true that the stock market provides the opportunity for higher growth, which is why his/her retirement fund is mostly in stocks, but the executive cannot afford to take the chance of losing the money going towards his/her education. Because money is needed for a specific purpose in the relatively near future, fixed-income securities are likely the best investment.

These two examples are clear cut, and they don't represent all investors. Most personal financial advisors advocate maintaining a diversified portfolio and changing the weights of asset classes throughout your life. For example, in 20s and 30s a majority of wealth should be in equities. In 40s and 50s the percentages shift out of stocks into bonds until retirement, when a majority of investments should be in the form of fixed income.

8.4.1 Characteristics of Bonds

Bonds have a number of characteristics of which you need to be aware. All of these factors play a role in determining the value of a bond and the extent to which it fits in the portfolio.

8.5 Face Value/Par Value

The face value (also known as the par value or principal) is the amount of money a holder will get back once a bond matures. A newly issued bond usually sells at the par value. Corporate bonds normally have a par value of \$1,000 in the USA but this amount can be much greater for government bonds.

What confuses many people is that the par value is not the price of the bond. A bond's price fluctuates throughout its life in response to a number of variables. When a bond trades at a price above the face value, it is said to be selling at a **premium**. When a bond sells below face value, it is said to be selling at a **discount**.

8.6 Coupon (The interest rate)

The coupon is the amount the bondholder will receive as interest payments. It's called a "coupon" because sometimes there are physical coupons on the bond that you tear off and redeem for interest. However, this was more common in the past. Nowadays, records are more likely to be kept electronically.

As previously mentioned, most bonds pay interest every six months, but it's possible for them to pay monthly, quarterly or annually. The coupon is expressed as a percentage of the par value. If a bond pays a coupon of 10% and its par value is \$1,000, then it'll pay \$100 of interest a year. A rate that stays as a fixed percentage of the par value like this is a fixed-rate bond. Another possibility is an adjustable interest payment, known as a floating-rate bond. In this case the interest rate is tied to market rates through an index, such as the rate on Treasury bills.

One might think that investors will pay more for a high coupon than for a low coupon. All things being equal, a lower coupon means that the price of the bond will fluctuate more.

8.7 Maturity

The maturity date is the date in the future on which the investor's principal will be repaid. Maturities can range from as little as one day to as long as 30 years (though terms of 100 years have been issued).

A bond that matures in one year is much more predictable and thus less risky than a bond that matures in 20 years. Therefore

1. The longer the time to maturity, the higher the interest rate.
2. Also, all things being equal, a longer term bond will fluctuate more than a shorter term bond.

To sum up, there is generally less risk in owning bonds than in owning stocks, but this comes at the cost of a lower return.

Bonds yield two types of returns. These are :

- The **rate of interest** the bond pays, called coupon rate and
- The **capital gain** or loss that accrues at the time of maturity or selling because of interest rate changes.

In cases of some bonds, interest rates are the most important aspect, whereas, in others (zero coupon) return is designed to be available at the time of maturity alone. On all these types of bonds, the yield to maturity (YTM) is the annual rate of return that one can expect from the investment. The YTM is calculated on the basis of the internal rate of return on the cash flow that the bond generates for an investor, if held up to the date of maturity. In the secondary markets bonds also find good attraction based on the intrinsic potential it carries. The price movements do take place through basis points of the price in the markets. Investors and traders have open opportunities to invest in bonds.

A basis point is one hundredth of 1%. The difference between 8.00% and 8.02% (2 basis points) is immaterial to most individual investors. To some institutional investors, however, a few basis points are noteworthy.

8.8 Risk of Fixed Income Security

DEFAULT RISK

Default risk, or credit risk, is the possibility that a borrower will be unable to repay principal and interest as agreed in the loan document. Standard & Poor's, Moody's, and other rating agencies estimate a firm's likelihood of default and assign

a credit rating. Investors control default risk by monitoring the ratings of the bonds they hold or consider for purchase. It is also called credit risk.

8.9 Reinvestment Rate Risk

Reinvestment rate risk refers to the possibility that cash coupons received will be reinvested at a rate different from a bond's started rate. The fact that cash receipts must be reinvested makes it impossible to "lock in" a certain yield to maturity with a coupon paying bond. The ultimate return a bond investor receives is dependent on the price paid for the bond, the coupon rate received, and the rate earned on reinvested coupon payments. This latter rate is unknown at the time of bond purchase, so it is a source of risk.

8.10 Interest Rate Risk

Interest rate risk refers to the chance of loss because of adverse movements in the general level of interest rates. Investors pay particular attention to this type of risk. Interest rate risk varies over countries. A prudent investor will find out the location considered most favourable from the point of view of the interest rate risk. A rise in interest rate will reduce a bond's value if one wants to dispose of it before maturity.

8.11 Malkiel's Theorems

Malkiel's theorem for the bonds and their prices of central importance in the bond market. There is a set of relationship among bond prices, time to maturity, and interest rates known as Malkiel's theorems. Understanding these price patterns is an essential thing for an investment professional. Malkiel's theorem runs as follows :

1. Bond Prices Move Inversely with Yields.
2. Theorem Two : Long Term Bonds Have More Risk.
3. Theorem Three : Higher Coupon Bonds Have Less Risk.
4. Theorem Four : The Importance of Theorem Two Diminishes with Time.
5. Theorem Five : Capital gains from an Interest Rate Decline Exceed the Capital Loss from an Equivalent Interest Rate Increase.

Theorem One : Bond Prices Move Inversely with Yields

If the general level of interest rises, the price of an existing bond will go down. Conversely, if the level of interest rates declines, the price of an existing bond

will increase. The reason this happens stems directly from the fixed income stream associated with a particular bond, and the effect of the time value of money.

Suppose that currently investors will pay par for a 10 year, 8%, AA-rated bond. The owner of \$1,000 par will receive \$40 every 6 months until the bond matures. Two months later the Federal Reserve Board lowers the discount rate one-half point. This change will generally result in a downward shift in the yield curve. Newly issued AA-rated bonds with a 7.5% coupon would provide \$75 per year in interest. Given a choice between two AA-rated bonds of equal maturity, one of which pays \$80 per year and the other paying \$75 per year, an investor would not pay the same price for these bonds.

Because the 8% bond is preferable, its price will rise until its yield falls to the current 7.5% level. This new price is \$1,034.75, or about 103 1/2% par. At this price its investment appeal is generally comparable to the new 7.5% coupon bonds.

Theorem Two : Long Term Bonds Have More Risk

If two bonds are similar in every respect except for the time remaining until they mature, the bond with the longest live will fluctuate most as interest rates change. Consider three bonds : (1) a 9% coupon bond that matures tomorrow, (2) a 9% consol (perpetual bond), and (3) a 9% bond maturing in one year. Regardless of what interest rates do, the first bond is worth \$1,000 tomorrow. It makes no difference if market rates go up or down. The holder of the consol, however, is very concerned about interest rate movements. If interest rates rise, be stuck with a security paying a below-market rate, conceivably forever. The consol has no maturity date to eventually pull the bond price up.

The holder of the one-year bond faces a situation that lies between these extremes. If interest rates rise tomorrow, the price of this bond will fall because it will pay a below-market rate for the next 12 months. In one year, though, it will be redeemed at par. In this sense investors experience no loss from the fall in the bond price because the "loss" is eventually recovered at maturity. If the bond is sold before maturity, however, there *would* be a loss in this instance.

Theorem Three : Higher Coupon Bonds Have Less Risk

The yield on a bond comes from two sources : the interest received and the return of the principal at maturity. Consider a 9.5% bond, maturing in 8 years, selling for \$900, with a yield to maturity of 11.44%.

Now consider another bond maturing in 8 years with a yield to maturity of 11.44% but with a zero coupon.

Suppose interest rates fall and 9-years bonds of similar risk now yield just 11.00%. The 9.5% coupon bond will rise by \$21.53 (2.4% of its market value) to \$921.53, while the zero coupon bond will rise by \$13.92 (3.4% of market value) to \$424.58. As required by the theorem, the higher coupon bond was least affected by the change in interest rates.

Theorem Four : The Importance of Theorem Two Diminishes with Time

Theorem Two tells us the longer the bond has until its maturity, the more its price will fluctuate. Theorem Four tells us when comparing two bonds; the relative importance of Theorem Two diminishes as the maturities of the two bonds increase. This theorem needs an example to illustrate it.

Suppose we have two bonds with identical coupons. Bond A matures in 3 years; Bond B matures in 5. If interest rates rise, we know from Theorem One that the price of both bonds will fall. Theorem Two tells us that Bond B, with its longer time until maturity, will fall in price the most.

Consider two other bonds, C and D. Bond C matures in 20 years, while Bond D matures in 22. Rising interest rates will cause the prices of these two bonds to fall also, and Bond D will fall more than Bond C. Theorem Four tells us that the price differential between the bonds will be larger with Bonds A and B than with C and D. In other words, the 2-year difference in maturity is more important with the short-term bonds than with the long-term bonds.

The table below indicates that if market interest rates rise from 11% to 12%, the prices of all four bonds fall. Note the longer the term of the bond, the greater the price decline.

| Yield to Maturity | Bond A : 3 Years | Bond C : 5 Years | Bond D : 20 Years | 22 Years |
|--------------------------|-----------------------------|-----------------------------|------------------------------|-----------------|
| 11% | \$975 | \$962 | \$920 | \$918 |
| 12% | \$951 | \$926 | \$850 | \$846 |
| Difference | \$24 | \$36 | \$70 | \$72 |
| | \$12 difference | | \$2 difference | |

Bonds A and B are 2 years apart in their maturities; the difference in their price changes is \$12. Bonds C and D are also 2 years apart, but the difference in their price changes are only \$2. As Theorem Four indicates, the extra 2 years make little difference for long-term bonds.

Theorem Five : Capital gains from an Interest Rate Decline Exceed the Capital Loss from an Equivalent Interest Rate Increase

This last theorem does not influence the portfolio manager's decisions. It is simply a mathematical fact of life. In table 10.1, we see that if interest rates rise by 1% (from 11% to 12%), the price of Bond A declines by \$24. If, instead, interest rates had fallen by 1% (to 10%), Bond A would sell for its par value of \$1,000, a price rises of \$25. The capital gain from a 1% drop in interest rates exceeds the capital loss from a 1% rise in interest rates.

Analysis of Malkiel's Theorems

We now turn to pair of bonds that appear in many of the examples to follow. Bond 8 matures in 8 years, has a 9.5% coupon, and sells for 90% of par. Bond 15 matures in 15 years, has an 11% coupon, and sells for 93% of par. What will happen to the prices of the two bonds if interest rates fall?

According to the first theorem, bond prices move inversely with interest rates, so both bond prices will rise. A more interesting question is determining which will raise the most. Because the first bond has the shortest maturity, Theorem Two indicates it should change in value less than the order bond. But the first bond also has a lower coupon than its counterpart. By theorem Three, it should change the most.

How do we reconcile this apparent contradiction? We do so by computing a statistic called duration, one of the handiest tools available to the fixed income portfolio manager. Duration deserves complete coverage, and the next section looks at this concept in detail.

8.12 Duration

For a noncallable security, duration is the weighted average time until a bond's cash flows are received. Duration is probably the central concept in modern fixed income security management. Once an advance topic, it is now fundamental. Michael Waldman states, "As perhaps their primary responsibility, fixed-income manager's

control the durations of their portfolios. In doing so, they govern the portfolio's exposure to interest rate movements, relative to the applicable liabilities or performance benchmarks." (-Journal of Fixed Income)

8.13 Macaulay Duration

The term duration is attributed to F.R. Macaulay who, in 1938, Suggested studying the time structure of a bond by measuring its average term to maturity. Duration can be determined for any cash flow stream; it is not limited to bond analysis. Various forms of duration are discussed today in the literature of Finance. The original measure is known as **Macaulay duration**.

When applied to a noncallable security, Macaulay duration is the time-value-of-money-weighted, average number of years necessary to recover the initial cost of the security. Duration's principal value to the financial manager or industrial engineer is that it is a direct measure of interest rate risk; the higher the duration, the higher is the interest rate risk.

With a noncallable bond, durations a weighted average of time until the cash flows occurs. However, in the increasingly complex world of fixed income securities, investors should avoid thinking of duration as a measure of time. Many debt instruments contain embedded options that may alter the security's cash flow stream. If the life or the payments of the bond are uncertain, thinking of duration as a measure of time can be misleading. The Vanguard mutual fund group calculates a duration to worst statistic based on duration to call (if the bond trades above par and is likely to be called) or duration to maturity (if the bond sells for a discount and is unlikely to be called).

8.14 The Bond Market

In The Merchant of Venice, Antonio secured his debt with Shylock with a "pound of flesh." And you thought your credit card interest rate was bad! Perhaps that is why Polonius advised Hamlet "neither a borrower nor a lender be." The terms of a loan can be onerous, but corporations and governments do borrow, often under burdensome terms, to finance investments in plants, equipment, or inventory or for the construction of roads and schools. Internally generated funds are often insufficient to finance such investments on a pay-as-you-go basis. Bonds, which mature at the end of a term longer than one year, permit firms and governments to acquire assets now and pay for them over a period of years. This long term debt is

then retired for corporations by the cash flow that is generated by plant and equipment and for governments by the fees or tax revenues that are collected.

8.14.1 General Features of Bonds

All bonds (i.e., long-term debt instruments) have similar characteristics. They represent the indebtedness (liability) of their issuers in return for a specified sum, which is called the principal. Virtually all debt has a maturity date, which is the particular date by which it must be paid off. When debt is issued, the length of time to maturity is set, and it may range from one day to 20 or 30 years or more. If the maturity date falls within a year of the date of issuance, the debt is referred to as short-term debt. Long-term debt matures more than a year after it has been issued. (Debt that matures in from 1 to 10 years is sometimes referred to as intermediate debt.) The owners of debt instruments receive a flow of payments, which is called interest, in return for the use of their money. Interest should not be confused with other forms of income, such as the cash dividends that are paid by common and preferred stock. Dividends are distributions from earnings, whereas interest is an expense of borrowing.

When a debt instrument such as a bond is issued, the rate of interest to be paid by borrower is established. This rate is frequently referred to as the bond's coupon rate. The amount of interest is usually fixed over the lifetime of the bond. (There are exceptions; for example, see the section on variable interest rate bonds later in this chapter.) The return earned by the investor, however, need not be equal to the specified rate of interest because bond prices change. They may be purchased at a discount (a price below the face amount or principal) or at a premium (a price above the face amount of the bond). The return actually earned, then, depends on the interest received, the purchase price, and what the investor receives upon selling or redeeming the bond.

The potential return offered by a bond is referred to as the yield. Yield is frequently expressed in two ways : the **current yield** and the **yield to maturity**. Current yield refers only to the annual flow of interest or income. The yield to maturity refers to the yield that the investor will earn if the debt instrument is held from the moment of purchase until it is redeemed at par (face value) by the issuer.

One would expect such a relationship because the longer the time to maturity, the longer the investor will tie up his or her funds. To induce investors to lend their money for lengthier periods, it is usually necessary to pay them more interest.

Also, there is more risk involved in purchasing a bond with a longer period to maturity, since the future financial condition of the issuer is more difficult to estimate for the longer term. This means that investors will ordinarily require additional compensation to bear the risk associated with long-term debt.

Although such a relationship between time and yield does usually exist, there have been periods when the opposite has occurred (i.e., when short-term interest rates exceeded long-term interest rates). This happened in USA from 1978 to 1979, and again in 1981, when short-term interest rates were higher than long-term rates.

8.14.2 The Indenture

Each debt agreement has terms that the debtor must meet. These are stated in a legal document called the **indenture**. These terms include the coupon rate, the date of maturity, and any other conditions required of the debtor. One of the more frequent of these requirements is the pledging of collateral, which is property that the borrower must offer to secure the loan. For example, the collateral for a mortgage loan is the building. Any other assets owned by the borrower, such as securities or inventory, may also be pledged to secure a loan. If the borrower defaults on the debt, the creditor may seize the collateral and sell it to recoup the principal. **Default** occurs when the borrower fails to meet not only the payment of interest but *any* of the terms of the indenture. The other conditions of the indenture are just as important as meeting the interest payments in time, and often they may be more difficult for the debtor to satisfy.

Examples of common loan restrictions include (1) limits on paying dividends, (2) limits on issuing additional debt, and (3) restrictions on merging or significantly changing the nature of the business without the prior consent of the creditors. In addition, loan agreements usually specify that if the firm defaults on any other outstanding debt issues, this debt issue is also in default, in which case the creditors may seek immediate repayment. Default on one issue, then, usually puts all outstanding debt in default.

8.14.3 The Role of The Trustee

Many debt instruments are purchased by individual investors who may be unaware of all the terms of the indenture. Even if individual investors are aware of the terms, they may be too geographically dispersed to take concerted action in case of default. To protect their interests, a **trustee** is appointed for each publicly held bond issue. It is the trustee's job to see that the terms of the indenture are upheld and

to take remedial action if the company defaults on the terms of the loan. For performing these services, the trustee receives payment from the issuer of debt.

Trustees are usually commercial banks that serve both the debtor and the bondholders. They act transfer agents for the bonds when ownership is changed through sales in the secondary markets. The signature of a trustee on the bond is a guarantee of the authenticity of the bond. These banks receive from the debtor the funds to pay the interest, and this money is then distributed to the individual bondholders. It is also the job of the trustee to inform the bondholders if the firm is no longer meeting the terms of the indenture. In case of default, the trustee may take the debtor to court to enforce the terms of the contract. If there is a subsequent reorganization or liquidation of the company, the trustee continues to act on behalf of the individual bondholders to protect their principal.

8.14.4 Forms of Debt

Debt instruments are issued in one of two forms : (1) **registered bonds or (2) bearer bonds** to which coupons are attached (therefore, they are also called coupon bonds). Registered bonds are similar to stock certificates; the bonds are registered in the owner's name. Delivery of the bonds is made to the registered owner, who also receives the interest payments from the trustee bank. When the bond is sold, it is registered in the name of the new owner by the transfer agent.

While many bonds may be registered in the name of the owner, most registered bonds are issued in **book form**. No actual bonds are printed; instead, a computer record of owners is maintained by the issuer or the issuer's agent, such as a bank. If a bond is sold only in book form, the investor cannot take delivery, and the bond must be registered in the street name of the investor's brokerage firm or whoever is holding the bond for the investor. Such a system is obviously more efficient than physically issuing the bond.

8.14.5 Bond Risk

A important characteristic of all debt is risk : risk that the interest will not be paid (i.e., risk of default); risk that the principal will not be repaid; risk that the price of the debt instrument may decline; risk that inflation will continue, thereby reducing the purchasing power of the interest payments and of the principal when it is repaid; risk that the bond will be retired (i.e. called) prior to maturity, thereby denying the investor the interest payments for the term of the bond; and risk that interest rates will fall, resulting in lower interest income when the proceeds are reinvested.

BOND RATINGS : MOODY'S BOND RATINGS (USA)

| | |
|-----|---|
| Aaa | Bonds of highest quality |
| Aa | Bonds High quality |
| A | Bonds whose security of principle and interest is considered adequate but may be impaired in the future |
| Baa | Bonds of speculative quality whose future cannot be considered well assured |
| B | Bonds that lack characteristics of a desirable investment |
| Caa | Bonds in poor standing that may be defaulted |
| Ca | Speculative bonds that are often in default |
| C | Bonds with poor prospects of any investment value (lowest rating) |

STANDARD & POOR'S BOND RATING (USA)

| | |
|--------|--|
| AAA | Bonds of highest quality |
| AA | High-quality debt obligations |
| A | Bond that have a strong capacity of pay interest and principle but may be susceptible to adverse effects |
| BBB | Bonds that have an adequate capacity to pay interest and principle but are more vulnerable to adverse economic condition or changing circumstances |
| B(+/-) | Bonds Of lower medium grade, few desirable investment characteristics |
| CCC | Primarily speculative bonds with great uncertainties and major risk if exposed to adverse conditions |
| C | Income bonds on which no interest is being paid |
| D | Bonds on default |

Plus (+) and minus (-) are used to show relative strength and weakness within a rating category.

These risks vary with different types of debt. For example, there is no risk of default on the interest payments and principal repayments of the debt of the federal government. The reason for this absolute safety is that the federal government has the power to tax and to create money. The government can always issue the money that is necessary to pay the interest and repay the principal.

The procedure is more subtle than just printing new money. The federal government in the USA issues new debt and sells it to the Federal Reserve Board. With the proceeds of these sales, the federal government retires the old debt. The money supply increases because newly created money is used to pay for the debt.

The effect of selling debt to the Federal Reserve Board and then using the proceeds to retire existing debt (or to finance a current deficit) is no different from printing and spending new money. The money supply explained in either case. Thus, the federal government can always pay its interest expense and retire its debt when it becomes due.

Even though the US federal government can refund its debt and hence is free of the risk of default, the prices of the federal government's bonds can and do fluctuate. In addition, the purchasing power of the dollar may decline as a result of inflation and, therefore, the purchasing power of funds invested in debt also may decline. Thus, investing in federal government securities is not free of risk, since the investor may suffer losses from price fluctuations of the debt or from inflation.

The debt of firms, individuals, and state and local governments involves even greater risk, for all these debtors may default on their obligations. To aid buyers of debt instruments, several companies have developed **credit rating systems**. The most important of these services are Moody, Dun and Bradstreet, and Standard & Poor's. Although these firms do not rate all debt instruments, they do rate the degree of risk of a significant number in the USA. In India we have four rating agencies while rating they consider (i) industry/sector risk, (ii) business risk, (iii) financial risk, (iv) management capability risk, and (v) project risk, if the borrowing company has big projects on hand. For details see M.Y. Khan, 'Indian Financial System' (2004).

8.15 Model Questions

1. Explain the features of bonds.
2. Briefly describe different types of bonds
3. What is duration? Discuss how duration can help in bond investment decisions.

4. Explain the unique features of Macaulay's duration
5. Explain Malkiel's theorems of Bonds.
6. How does bond risk affect the bond investment?
7. Compare the bond rating systems of Moody and S &P.
8. What are the general strengths of bonds with respect to stocks?
9. Give a brief account of the corporate debt instruments in India.

8.16 Appendix

Corporate Debt Instruments in India (medium-to-long term)

In India, apart from bonds issued by development financial institutions, debentures (convertible/nonconvertible/partly convertible) are issued by public limited companies in the new issue market. A company offering these debt instruments through an offer document should comply with the following rules.

Such an issue can be made only if credit rating of a minimum investment grade is obtained from at least 2 registered credit rating agencies. The offer document should specifically state the assets on which the security would be created. The security/asset cover to be maintained, the basis of its computation and valuation should be disclosed. A company has to create debenture redemption reserves as per requirements of the companies Act for redemption of debentures. A company must appoint one or more debenture trustee (s), under the companies Act, before issuing a prospectus/letter of offer to the public for subscription to its debentures. In case of companies which have defaulted in payment of interest on debentures or their redemption or in creation of security as per the terms of the issue, it cannot distribute dividends without prior approval of debenture trustees.

If a company wants to rollover the debentures issued by it, it should file with the SEBI a copy of the notice of the resolution to be sent to the debenture-holders through a merchant bank prior to despatch of the same to the concerned debenture-holders. No company should issue fully convertible debentures having a conversion period of more than 36 months unless conversion was made optional with 'put' and 'call' option, so that unwilling holders may withdraw from the scheme.

8.17 Reference

M. Y. Khan, Indian Financial System (2004), Tata Mcgrow Hill, New Delhi.

Unit 9 □ Yield Curve Analysis – Term Structure of Interest Rate

Structure

9.1 Introduction

9.2 The Term Structure

9.3 Yield Curve

9.4 Yield Curve and The Term Structure of Interest Rates

9.5 The Credit Spread

9.6 Macaulay Duration

9.6.1 Modified Duration

9.6.2 Effective Duration

9.6.3 Key-Rate Duration

9.7 Questions

9.1 Introduction

The effect of selling debt to the government or Federal Reserve Board and then using the proceeds to retire existing debt (or to finance a current deficit) is no different from printing and spending new money. Thus, the federal government can always pay its interest expense and retire its debt when it becomes due.

Even though the government can refund its debt and hence is free of the risk of default, the prices of the government's bonds can and do fluctuate. In addition, the purchasing power of money may decline as a result of inflation and, therefore, the purchasing power of funds invested in debt also may decline. Thus, investing in government securities is not free of risk, since the investor may suffer losses from price fluctuations of the debt or from inflation over the long run.

The debt of firms, individuals, and state and local governments involves even greater risk, for all these debtors may default on their obligations. To aid buyers of debt instruments, many countries have developed **credit rating systems**. The most important of these firms do not rate all debt instruments, they do rate the degree of risk of a significant number. CRISIL, ICRA, FITCH and some others are important in India.

9.2 The Term Structure

The relationship between the rate of interest and the length of time maturity is often referred to as the term structure of interest rates. During most period of history, it has been observed that the longer the term to maturity, the higher the rate of interest. One possible explanation for the relationship is that inventors have a preference for liquidity. To induce individuals to commit their funds for a longer term, the interest rate has to be higher to compensate them for the loss of liquidity.

This explanation is very plausible, but there have been periods when short term interest rates have been higher than long-term rates. This had led to the development of an alternative explanation of the structure of yields based on investor expectation concerning future interest rates. This expectation theory suggests that the long-term rate is an average of the current short-term rates and the expected future short-term rate.

Consider an investor faced with the two following investment alternatives :

One-year bond 4%

Two-year bond 6%

If the investor purchases the two-year bond, the yield is locked in for two years. However, if the one-year bond is purchased, the inventor can reinvest the proceeds when the bond matures. She will seek to earn the same return on either alternative, besides many others : (1) the one-year bond in combination with a second one year bond or (2) the two-year bond. Thus, the choice between the two alternatives depends on what the expected future rate on the one-year bond will be.

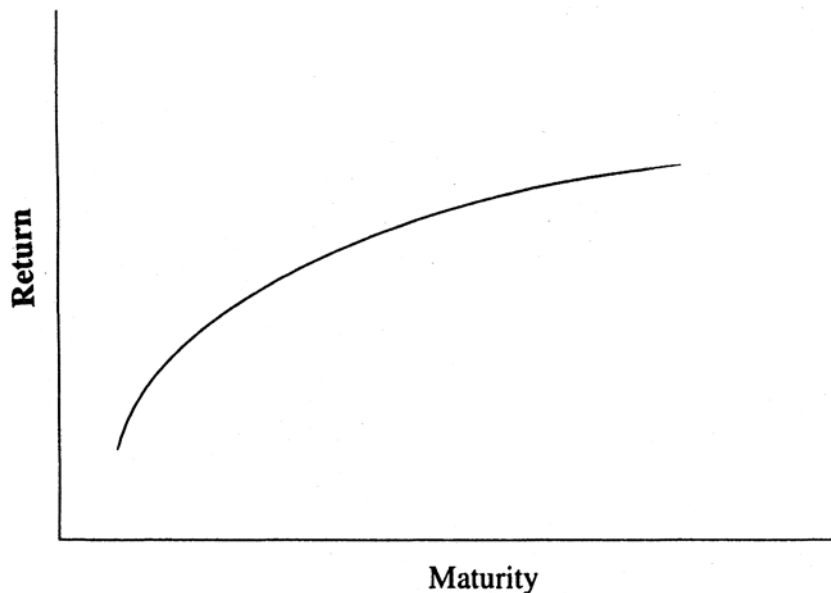
For the yield on the two alternatives to produce the same return over two years, the funds reinvested when the one-year bond matures must earn 10 percent during the second year. The average yield is 5 percent in both cases. The yield on the two-year bond equals the yield on the combination of the 4 percent and 10 percent one-year bonds.

However, suppose the investor anticipates that the one-year rate in the future will be 10 percent. If the current one-year bond is purchased, the individual can reinvest the funds when it matures and earn 10 percent for one year. The average return over the two years is 7 percent and equals the 7 percent annual yield on the two-year bond. Obviously, the two one-year or a two year security will be considered the same. However if the investor anticipates that the future one-year rate will be 9

percent, the average yield over the two years is 6.5 percent annually, which is inferior to the 7 percent earned annually on the two-year bond.

Although an individual may move between the one and two two-year bonds, this is not true in the aggregate. Investors as a whole cannot alter their portfolios selling one security and purchasing another. Such attempts to alter portfolios changes the securities prices and yields. If all investors expected the future one-year rate to be 12 percent, they would seek to sell the two-year bond.

In addition to the **liquidity preference and the expectations theory** of the term structure of interest, a third alternative explanation has been suggested. It is referred to as the **segmentation theory**, and it suggests that yield depends on the demand for and supply of credit in various segments of the financial markets. For example, suppose funds were to flow from saving and loan associations and other savings institutions to money market mutual funds. Since the money market mutual funds make only short-term loans and no mortgage loans, there has been a change in the supply of credit in the supply in the two : short term and long term markets. Simultaneously, the supply of short-term credit has increased, which should tend to reduce short-term interest rates. The structure of yield thus depends on the supply and demand for credit from the various segment of the economy. A flow from one segment to another alters the supply of this credit, causing yield (i.e., the term structure of interest rates) to change. A flow of funds from financial institutions that grant short-term loans to those marking long-term loans will then result in a negatively sloped yield curve.



9.3 Yield Curve

A graphic line chart that shows interest rates at a specific point for all securities having equal risk, but different maturity dates. For bonds, it typically compares the two- or five-year bond with the 30-year gilt-edged. In India the maximum tenure of a gilt is 30 years and of a Treasury Bill is 364 days. Securities with longer maturities usually have a higher yield. If short-term securities offer a higher yield, then the curve is said to be inverted.

9.4 Yield curve and The Term Structure of interest Rates

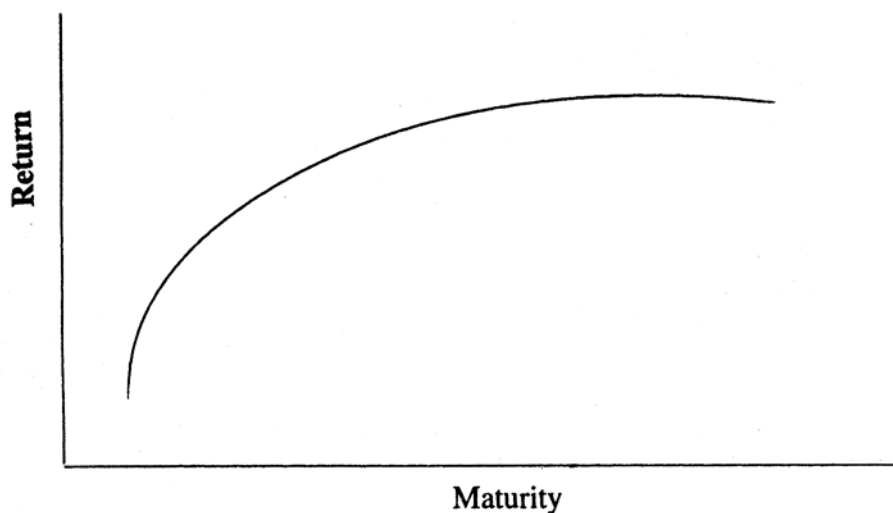
The term structure of interest rates, also known as the yield curve, is a very common bond valuation method. Constructed by graphing the yield to maturities and the respective maturity dates of benchmark fixed-income securities, the yield curve is a measure of the market's expectations of future interest rates given the current market conditions. Treasuries, issued by the US federal government, are considered risk-free, and as such, their yields are often used as the benchmarks for fixed-income securities with the same maturities. The term structure of interest rates is graphed as though each coupon payment of a non-callable fixed-income security were a zero-coupon bond that "matures" on the coupon payment date. The exact shape of the curve can be different at any point in time. So if the normal yield curve changes shape, it tells investors that they may need to change their outlook on the economy and the scrip market.

There are three main patterns created by the term structure of interest rates :

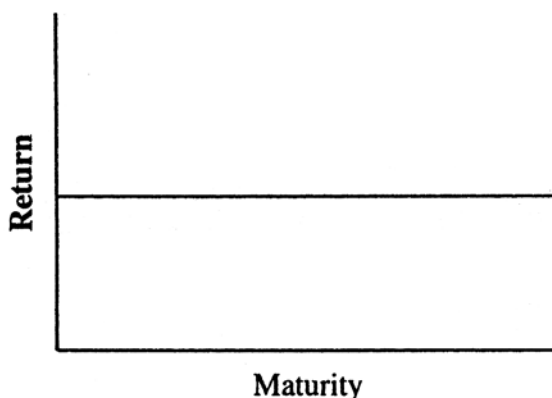
(1) Normal Yield Curve : As its name indicates, this is the yield curve shape that forms during normal market conditions, wherein investors generally believe that there will be no significant changes in the economy, such as in inflation rates, and that the economy will continue to grow at a normal rate. During such conditions, investors expect higher yields for fixed income instruments with long-term maturities that occur further into the future. In other words, the market expects long-term fixed income securities to offer higher yields than short-term fixed income securities. This is a normal expectation of the market because short-term instruments generally hold less risk than long-term instruments : the further into the future the bond's maturity, the more time and therefore uncertainty the bondholder faces before being paid back the principal. To invest in one instrument for a longer period of time, an investor needs to be compensated for undertaking the additional risk.

We should remember that as general current interest rates increase, the price of a bond will decrease, and its yield will increase—

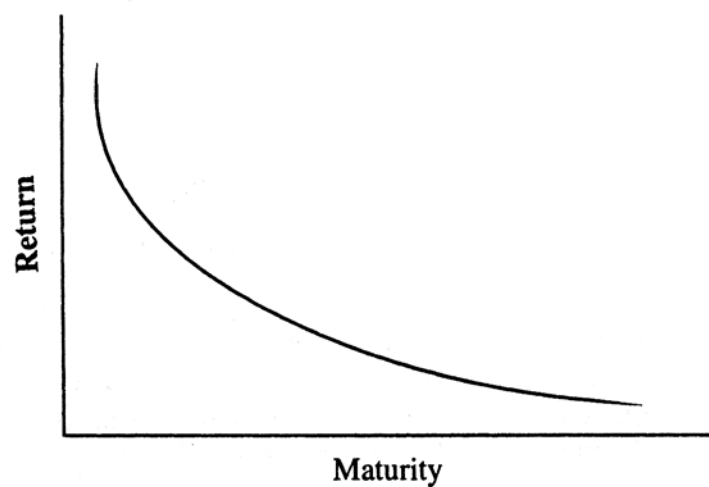
(2) Flat Yield Curve : These curves indicate that the market environment is sending mixed signals to investors, who are interpreting interest rate movements in



various ways. During such an environment, it is difficult for the market to determine whether interest rates will move significantly in either direction further into the future. A flat yield curve usually occurs when the market is making a transition that emits different but simultaneous indications of what interest rates will do : there may be some signals that short-term interest rates will rise and other signals that long-term interest rates will fall. This condition will create a curve that is flatter than its normal positive slope. When the yield curve is flat, investors can maximize their risk/return tradeoff by choosing fixed-income securities with the least risk, or highest credit quality. In the rate instances wherein long-term interest rates decline, a flat curve can sometimes lead to an inverted curve.



(3) Inverted Yield Curve : These yield curves are rare, and they form during extraordinary market conditions wherein the expectations of investors are completely the inverse of those demonstrated by the normal yield curve. In such abnormal market environments, bonds with maturity dates further into the future are expected to offer lower yields than bonds with shorter maturities. The inverted yield curve indicates that the market currently expects interest rates to decline as time moves further into the future, which in turn means the market expects yields of long-term bonds to decline. (We need to remember that as interest rates decrease, bond prices increase and yields decline.)

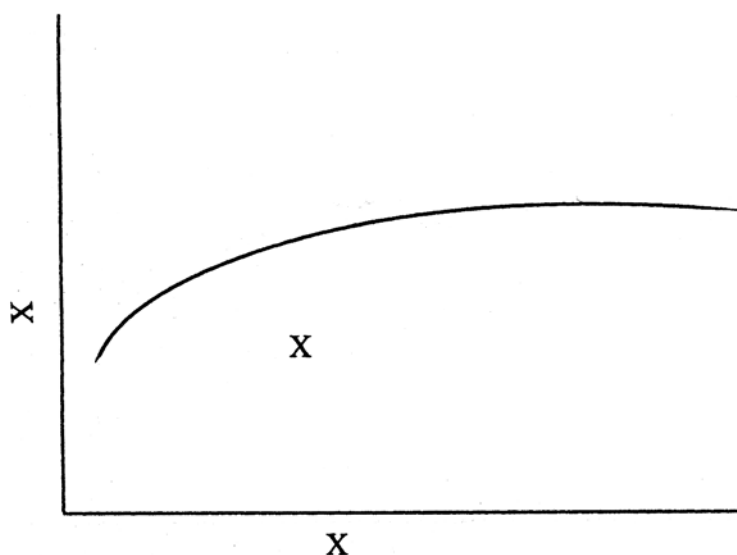


You may be wondering why investors would choose to purchase long-term fixed-income investments when there is an inverted yield curve, which indicates that investors expect to receive less compensation for taking on more risk. Some investors, however, interpret an inverted curve as an indication that the economy will soon experience a slowdown, which causes future interest rates to give even lower yields. Before a slowdown, it is better to lock money into long-term investments at present prevailing yields (because future yields will be even lower).

The Theoretical Spot Rate Curve

Unfortunately, the basic yield curve does not account for securities that have varying coupon rates. When the yield to maturity was calculated, we assumed that the coupons were reinvested at an interest rate equal to the coupon rate—therefore, the bond was priced at par as though prevailing interest rates were equal to the bond's coupon rate.

The spot-rate curve addresses this assumption and accounts for the fact that many Treasuries offer varying coupons and would therefore not accurately represent similar non-callable fixed-income securities. If for instance you compared a 10-year bond paying a 7% coupon with a 10-year Treasury bond that currently has a coupon of 4%, your comparison wouldn't mean much. Both of the bonds have the same term to maturity, but the 4% coupon of the Treasury bond would not be an appropriate benchmark for the bond paying 7%. The spot-rate curve, however, offers a more accurate measure as it adjusts the yield curve so it reflects any variations in the interest rate of the plotted benchmark. The interest rate taken from the plot is known as the spot rate.

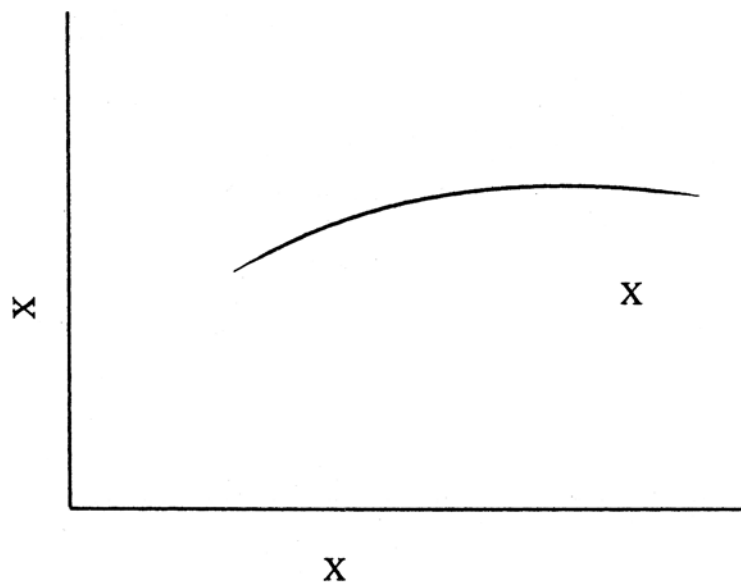


The spot-rate curve is created by plotting the yields of zero-coupon Treasury bills and their corresponding maturities. The spot rate given by each zero-coupon security and the spot-rate curve are used together for determining the value of each zero-coupon component of a non-callable fixed-income security. (The term structure of interest rates is graphed as though each coupon payment of a non-callable fixed-income security were a zero-coupon bond.)

Since T-bills issued by the government do not have maturities greater than one year, the bootstrapping method is used to fill in interest rates for zero-coupon securities greater than one year. Bootstrapping equates to a T-bill's value to the value of all zero-coupon components that from the security.

9.5 The Credit Spread

The credit or quality spread is the additional yield an investor receives for acquiring a corporate bond instead of a similar federal instrument. As illustrated in the graph below, the spread is demonstrated as the yield curve of the corporate bond is plotted with the term structure of interest rates. Remember that the term structure of interest rates is a gauge of the direction of interest rates and the general state of the economy. Since corporate fixed-income securities have more risk of default than federal securities, the prices of corporate securities are usually lower, and as such corporate bonds have a higher yield.



When inflation rates are increasing (or the economy is contracting) the credit spread between corporate and Treasury securities widens. This is because investors must be offered additional compensation (in the form of a higher coupon rate) for acquiring the higher risk associated with corporate bonds.

When interest rates are declining (or the economy is expanding), the credit spread between Federal and corporate fixed-income securities generally narrows. The lower interest rates give companies an opportunity to borrow money at lower rates, which allows them to expand their operations and also their cash flows. When interest rates are declining, the economy is expanding in the long run, so the risk associated with investing in a long-term corporate bond is also generally lower.

Now you have a general understanding of the concepts and uses of the yield curve. The yield curve is graphed using government securities, which are used as benchmarks for fixed income investments. The yield curve in conjunction with the credit spread is used for pricing corporate bonds. Now that you have a better understanding of the relationship between interest rates, bond prices, and yields, we are ready to examine the degree to which bond prices change with respect to a change in interest rates.

9.6 Macaulay Duration

The formula usually used to calculate a bond's basic duration is the Macaulay duration, which was created by Frederic Macaulay in 1938 but not commonly used until the 1970s.

Macaulay duration is calculated by adding the results of multiplying the present value of each cash flow by the time it is received, and dividing by the total price of the security. The formula for Macaulay duration is as follows :

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^n \frac{t \cdot C}{(1+i)^t} + \frac{n \cdot M}{(1+i)^n}}{P}$$

n=number of cash flows

t=time to maturity

c=cash flow

i=required yield

M=maturity (par) value

p=bond price

$$C * \frac{\left[1 - \left[\frac{1}{(1+i)^n} \right] \right]}{i} + \frac{M}{(1+i)^n}$$

Let us remember that bond price equals

So the following is an expanded version of Macaulay duration :

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^n \frac{t \cdot C}{(1+i)^t} + \frac{n \cdot M}{(1+i)^n}}{C * \left[\frac{1 - \left[\frac{1}{(1+i)^n} \right]}{i} \right] + \frac{M}{(1+i)^n}}$$

Let's go through an example :

Betty holds a five-year bond with a par value of \$1000 and coupon rate of 5%. For simplicity, let's assume that the coupon is paid annually and that interest rates are 5%. What is the macaulay duration of the bond ?

$$\begin{aligned}
 &= \frac{\sum_{t=1}^n \frac{t \cdot C}{(1+i)^t} + \frac{n \cdot M}{(1+i)^n}}{C \cdot \left[\frac{1 - \left[\frac{1}{(1+i)^n} \right]}{i} \right] + \frac{M}{(1+i)^n}} \\
 &= \frac{\frac{1 \cdot 50}{(1+0.05)} + \frac{2 \cdot 50}{(1+0.05)^2} + \frac{3 \cdot 50}{(1+0.05)^3} + \frac{4 \cdot 50}{(1+0.05)^4} + \frac{5 \cdot 50}{(1+0.05)^5} + \frac{5 \cdot 1000}{(1+0.05)^5}}{50 \cdot \left[\frac{1 - (1+0.05)^{-5}}{0.05} \right] + \frac{1000}{(1+0.05)^5}} \\
 &= \frac{47.619 + 90.7029 + 129.5756 + 164.5405 + 195.8815 + 3917.6308}{216.4738335 + 783.5261665} \\
 &= 4.55 \text{ years}
 \end{aligned}$$

Fortunately, if you are seeking the Macaulay duration of a zero-coupon bond, the duration would be equal to the bond's maturity, so there is no calculation required.

9.6.1 Modified Duration

Modified Duration is a modified version of the Macaulay model that accounts for changing interest rates. Because they affect yield, fluctuating interest rates will affect duration, so this modified formula shows how much the duration changes for each percentage change in yield. For bonds without any embedded features, bond price and interest rate move in opposite directions, so there is an inverse relationship between modified duration and an approximate one-percentage change in yield. Because the modified duration formula shows how a bond's duration changes in relation to interest rate movements, the formula is appropriate for investors wishing to measure the volatility of a particular bond. Modified duration is calculated as the following :

$$\text{Modified Duration} = \left[\frac{\text{Macaulay Duration}}{\left(1 + \frac{\text{yield to maturity}}{\text{number of coupon periods per year}} \right)} \right]$$

OR

$$\text{Modified Duration} = \left[\frac{\text{Macaulay Duration}}{\left(1 + \frac{\text{YTM}}{n} \right)} \right]$$

Let's continue analyzing Betty's bond and run through the calculation of her modified duration. Currently her bond is selling at \$1000, or par, which translates to a yield to maturity of 5%. Remember that we calculated Macaulay duration of 4.55.

$$\text{Modified Duration} = \left[\frac{4.55}{\left(1 + \frac{0.05}{1} \right)} \right]$$

$$= 4.33 \text{ years}$$

Our example shows that if the bond's yield changed from 5% to 6%, the duration of the bond will have declined to 4.33 years. Because it calculates how duration will change when interest increases by 100 basis points, the modified duration will always be lesser than Macaulay duration.

9.6.2 Effective Duration

As the modified duration formula discussed above assumes that the expected cash flows will remain constant, even if prevailing interest rates change, it is accurate for option-free fixed-income securities. On the other hand, cash flows from securities with embedded options or redemption features will change when interest rates change. For calculating the duration of these types of bonds, effective duration is the most appropriate.

Effective duration requires the use of binomial trees to calculate the option-adjusted spread (OAS). There are entire courses built around just those two topics, so the calculations involved for effective duration is beyond the scope of this tutorial. There are, however, many programs available to investors wishing to calculate effective duration.

9.6.3 Key-Rate Duration

The final duration calculation to learn is key-rate duration, which calculates the spot durations of each of the 11 “key” maturities along a spot rate curve. These 11 key maturities are at the 3-month and 1, 2, 3, 5, 7, 10, 15, 20, 25, and 30-year portions of the curve.

In essence, key-rate duration, while holding the yield for all other maturities constant, allows the duration of a portfolio to be calculated for a one-basis-point change in interest rates. The key-rate method is most often used for portfolios such as the bond-ladder, which consists of fixed-income securities with differing maturities. Here is the formula for key-rate duration :

$$\frac{\text{Price of security after a 1\% decrease in yield} - \text{Price of security after a 1\% increase in yield}}{2 * (\text{Initial price of security}) * 1\%}$$

The sum of the key-rate durations along the curve is equal to the effective duration.

Formula for bond analysis.

$$\text{30 / 360 day Count} = \frac{\text{Number of days in period assuming 30 days per month}}{\text{Number of days in year (360)}}$$

$$\text{Accrued Interest (AI)} = \text{Coupon} * \left(\frac{\text{Days between settlement and coupon dates}}{\text{Total days in period}} \right)$$

$$\text{Actual / Actual Day Count (Non - leap year)} = \frac{\text{Actual number of days in period}}{\text{Actual number of days in year (365)}}$$

$$\text{Actual / Actual Day Count (Leap year)} = \frac{\text{Actual number of days in period}}{\text{Actual number of day in year (366)}}$$

$$\text{Adjusted Current Yield} = \left[\frac{\text{Annual Coupon}}{\text{market Price}} \right] * 100 + \left[\frac{(100 - \text{Market Price})}{\text{Years to Maturity}} \right]$$

$$\text{Bond Price} = C * \frac{\left[1 - \left[\frac{1}{(1+i)^n} \right] \right]}{i} + \frac{M}{(1+i)^n}$$

$$\text{Current Yield} = \frac{\text{Annul Dollar Interest Paid}}{\text{Market Price}} * 100$$

Key Rate Duration =

$$\frac{\text{Price of security after a 1\% decrease in yield} - \text{Price of security after a 1\% increase in yield}}{2 * (\text{Initial price of security}) * 1\%}$$

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^n \frac{t * C}{(1+i)^t} + \frac{n * M}{(1+i)^n}}{C * \left[\frac{1 - \left[\frac{1}{(1+i)^n} \right]}{i} \right] + \frac{M}{(1+i)^n}}$$

$$\text{Modified Duration} = \left[\frac{\text{Macaulay Duration}}{\left(1 + \frac{\text{VTM}}{n} \right)} \right]$$

$$\text{Yield} = \left(\frac{\text{Future Value}}{\text{Purchase Price}} \right)^{\frac{1}{n}} - 1$$

$$\text{Yield to Call} = \text{Cashflow} * \frac{1 - \left(\frac{1}{(1+i)^{\text{of periods until Call}}} \right)}{i} + \left[\text{Call Value} * \frac{1}{(1+i)^{\text{of periods until call}}} \right]$$

$$\text{Yield to put} = \text{Cashflow} * \frac{1 - \left(\frac{1}{(1+i)^{\text{of periods until put}}} \right)}{i} + \left[\text{put value} * \frac{1}{(1+i)^{\text{of period until put}}} \right]$$

$$\text{Zero Coupon Bond Price} = \frac{M}{(1+i)^n}$$

9.7 Model Questions

1. Describe the features of a normal yield curve
2. Explain with graphical analysis different types of yield curves.
3. What is the basic relationship between yield curve and term structure?

4. Discuss how changes in the market speculation make the term structure?
5. What is Duration? How does it affect the yield to a bond?
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Unit 10 □ Introduction to Derivatives and Derivatives Markets

Structure

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10.1 Introduction

Derivatives are financial securities whose value is derived from another “underlying” asset. The underlying asset can be equity forex/ any other asset. The price of the derivative is driven by the spot price of the underlying asset. Financial asset prices are never stable. Through the use of derivatives it is possible to transfer price risks by locking in asset prices. This reduces impact of fluctuations in asset prices which is important for risk-averse investors. Options, futures, swaps, swaptions, structured notes are all examples of derivative securities. Derivatives can be used for

hedging (protecting against financial risk) or can be used to speculate on the movement of commodity or security prices, interest rates or the levels of financial indices. The valuation of derivatives makes use of the statistical mathematics of uncertainty, which is very complex.

A derivative financial product is a contrived instrument, the value of which depends indirectly on the price of a cash instrument. The price of the cash instrument is referred to as the “underlying” price, quite often. Examples of cash instruments include actual shares in a company, physical stocks of commodities, cash foreign exchange, etc. A derivative market has developed in India after 2000 when derivatives were first introduced. (i.e. take risk)

Three most commonly used derivative contracts are options, forwards and futures.

10.2 Why use Options?

There are two main reasons why an investor would use options : to speculate and to hedge (i.e. protect against risk).

Speculation

One can think of speculation as betting on the movement of the price of an asset. The advantage of options is that you aren't limited to making a profit only when the market goes up. Because of the versatility of options, one can also make money when the market goes down or even sideways.

Speculation is the territory in which the big money is made—and lost. The use of options in this manner is the reason options have the reputation of being risky. When one buys an option, she has to be correct in determining not only the direction of the stock's movement, but also the magnitude and the timing of this movement. To succeed, one must correctly predict whether a stock will go up or down, and she has to be right about how much the price will change as well as the time frame it will take for all this to happen. And don't forget commissions too!

So why do people speculate with options if the odds are so skewed? Aside from versatility, it's all about using leverage. When the option trader is controlling 100 shares with one contract, it doesn't take much of a price movement to generate substantial profits. Profits may grow infinite for options buyers in certain situations. In some other cases it may dip down the seas.

Hedging

Another function of options is hedging. One can think of this as an insurance policy. Just as one insures his house or car, options can be used to insure the investments against a downturn. Critics of options say that if you are so unsure of your stock pick that you need a hedge, you shouldn't make the investment. On the other hand, there is no doubt that hedging strategies can be useful, especially for large institutions. Even the individual investor can benefit. Imagine you wanted to take advantage of technology stocks and their upside, but say you also wanted to limit any losses. By using options, you would cost-effectively be able to restrict your downside while enjoying the full upside.

10.3 Stock Options

Although employee stock options aren't available to everyone, this type of option could, in a way, be classified as a third reason for using options. Many companies use stock options as a way to attract and to keep talented employees, especially management. They are similar to regular stock options in that the holder has the right but not the obligation to purchase company stock. The contract, however, is between the holder and the company, whereas a normal option is a contract between two parties that are completely unrelated to the company.

10.3.1 Types of Options

There are two main types of options :

- **AMERICAN OPTIONS** can be exercised any time between the date of purchase and the expiration date. The example about Cory's tequila Co. is an example of the use of an American option. Most exchange-traded options are of this type.
- **EUROPEAN OPTIONS** are different from American options in that they can only be exercised at the end of their life.

The distinction between American and European options has nothing to do with geographic location.

Long-Term Options

So far we've only discussed options in a short-term context. There are also options with holding times of one, two, or multiple years, which may be more appealing for long-term investors.

These options are called LEAPS (which stands for Long-Term Equity Anticipation Securities). By providing opportunities to control and manage risk or even speculate, they are virtually identical to regular options. LEAPS, however, provide these opportunities for much longer periods of time. Although they are not available on all stocks, LEAPS are available on most widely-held issues.

Long-Term Equity Anticipation Securities (Leaps)

This is an options contract that expires more than nine months in advance, and can last as long as two years. Normal options tend to last no longer than nine months. LEAPS are an excellent way, if not the only way, to make a long-term option investment. They trade like normal options but allow investors to benefit from the appreciation of equities while placing a lot less money at risk than is required to purchase stock.

Exotic Options

The simple calls and puts we've discussed are sometimes referred to a "plain vanilla" options. Even though the subject of options can be difficult to understand at first, these "plain vanilla" options are as easy as it gets!

Because of the versatility of options, there are many types and variations of options. Non-standard options are called exotic options, which either are variations on the payoff profiles of the plain vanilla options or are wholly different products with flexibilities embedded in them.

10.4 Trading a Stock Versus Stock Options

Many traders think of a position in stock options as a stock substitute that has a higher leverage and less required capital. After all, options can be used to bet on the direction of the stock price, just like the stock itself. But options have very different characteristics than stocks, and there is also a lot of terminology the new option trader must learn.

The two types of options are calls and puts. When you buy a call option, you have the right but not the obligation to purchase a stock at the strike price any time before the option expires. When you buy a put option, you have the right but not the obligation to sell a stock at the strike price any time before the expiry date.

10.5 Differences between Stocks and Options

One important difference between stocks and options is that stocks give you a small piece of ownership in the company, while options are just contracts that give you the right to buy or sell the stock at a specific price by a specific date. It is important to remember that there are always two sides for every option transaction : a buyer and a seller. So, for every call or put option purchased, there is always someone else selling it.

When individuals sell options, they effectively create a security that didn't exist before. This is known as writing an option and explains one of the main sources of options, since neither the associated company nor the options exchange issues options. When you write a call, you may be obligated to sell shares at the strike price any time before the expiration date. When you write a put, you may be obligated to buy shares at the strike price any time before expiration.

Trading stocks can be compared to gambling in a casino, where you are betting against the house, so if all the customers have an incredible string of luck, they could all win. But trading options is more like betting on horses at the racetrack. There they use pari-mutuel betting, whereby each person bets against all the other people there. The track simply takes a small cut for providing the facilities. So, trading options, like the horse track, is a zero-sum game. The option buyer's gain is the option seller's loss and vice versa : any payoff diagram for an option purchase must be the mirror image of the seller's payoff diagram.

10.6 Basics of Options

The price of an option is called its premium. The buyer of an option cannot lose more than the initial premium paid for the contract, no matter what happens to the underlying security. So, the risk to the buyer is never more than the amount paid for the option. The profit potential, on the other hand, is theoretically unlimited.

In return for the premium received from the buyer, the seller of an option assumes the risk of having to deliver (if a call option) or taking delivery (if a put option) of the shares of the stock. Unless that option is covered by another option or a position in the underlying stock, the seller's loss can be open-ended, meaning the seller can lose much more than the original premium received.

You should be aware that there are two basic styles of options : American and European When the strike price of a call option is above the current price of the stock, the call is out of the money and when the strike price is below the stock price it is in the money. Put options are the exact opposite, being out of the money when the strike price is below the stock price and in the money when the strike price is above the stock price.

Note that options are not available at just any price. Stock options are generally traded with strike prices in intervals of \$2.50 up to \$30 and in intervals of \$ above that. Also, only strike prices within a reasonable range around the current stock price are generally traded. Far in or out-of-the-money options might not be available.

All stock options expire on a certain date, called the expiration date. For normally listed options, this can be up to nine months from the date the options are first listed for trading. Longer-term option contracts, called LEAPS, are also available on many stocks, and these can have expiration dates up to three years from the listing date.

Options officially expire on the Saturday following the third Friday of the expiration month. But, in practice, that means the option expires on the third Friday, since your broker is unlikely to be available on Saturday and all the exchanges are closed. The broker-to-broker settlements are actually done on Saturday.

Unlike shares of stock, which have a three-day settlement period, options settle the next day? In order to settle on the expiration date (Saturday), you have to exercise or trade the option by the end of the day on Friday.

10.6.1 Trading Options

A more complex type of security than the stocks with which they are associated, options can be used in a wide variety of strategies, from conservative to high risk. They can also be tailored to meet expectations that go beyond a simple 'the stock will go up' or 'the stock will go down'. Once you move beyond learning options terminology, You need to develop a thorough understanding of risk to trade options successfully. That also means understanding the factors that affect an option's price.

10.6.2 Directional Trading

When most stock traders first begin using options, it is usually to purchase a call or a put for directional trading, which traders practice when they are confident that

a stock price will move in a particular direction and they open an option position to take advantage of the expected movement. These traders may decide to try investing in options rather than the stock itself because of the limited risk, high potential reward and smaller amount of capital required to control the same number of shares or stock.

If your outlook is positive (bullish), buying a call option creates the opportunity to share in the upside potential of a stock without having to risk more than a fraction of its market value. If you are bearish (anticipate a downward price movement), buying a put lets you take advantage of a fall in the stock price without the large margin needed to short a stock.

10.6.3 Market Direction

There are many different kinds of option strategies that can be constructed, but the success of any strategy depends on the trader's thorough understanding of the two types of options : the put and the call. Furthermore, taking full advantage of options requires changing how you think. Those option traders who still think solely in terms of market direction may appreciate the flexibility and leverage options offer, but these traders are missing some of the other opportunities that options provide.

Besides moving up or down, stocks can move sideways or trend only modestly higher or lower for long periods of time. They can also make substantial moves up or down in price, then reverse direction and end up back to where they started. These kinds of price movements cause headache for stock traders but give option traders the unique and exclusive opportunity to make money even if the stock goes nowhere. Calendar spreads, straddles, strangles and butterflies are some of the strategies designed to profit from those types of situations.

10.7 Option Pricing

Stock option traders have to learn to think differently because of the additional variables that affect an option's price and the resulting complexity of choosing the right strategy. With stocks you only have to worry about one thing : price. So, once a stock trader becomes good at predicting the future movement of a stock's price, he or she may figure it is an easy transition from stocks to options-not so. In the landscape of options you have three shifting parameters that affect an option's price : price of the stock, time and volatility. Changes in any one of these three variables will affect the value of your options.

There are a number of different mathematical formulas, or models, that are designed to compute the fair value of an option. You simply input all the variables (stock price, time, interest rates, dividends and future volatility), and you get an answer that tells you what an option should be worth. Here are the general effects the variables have on an option's price :

Price of the Underlying

The value of calls and puts are affected by changes in the underlying stock price in a relatively straightforward manner. When the stock price goes up, calls should gain in value and puts should decrease. Put options should increase in value and calls should drop as the stock price falls.

Time

The effect of time is also relatively easy to conceptualize, although it also takes some experience before you truly understand its impact. The option's future expiry, at which time it may become worthless, is an important and key factor of every option strategy. Ultimately, time can determine whether your option trading decisions are profitable. To make money in options over the long term, you need to understand the impact of time on stock and option positions.

With stocks, time is a trader's ally as the stocks of quality companies tend to rise over long periods of time. But time is the enemy of the options buyer. If days pass without any significant change in the stock price, there is a decline in the value of the option. Also, the value of an option declines more rapidly as the option approaches the expiration day. That is good news for the option seller, who tries to benefit from time decay, especially during that final month when it occurs most rapidly.

Volatility

The effect of volatility on an option's price is usually the hardest concept for beginners to understand. The beginning point of understanding volatility is a measure called statistical (sometimes called historical) volatility, or SV for short. SV is a statistical measure of the past price movements of the stock; it tells you how volatile the stock has actually been over a given period of time.

But to give you an accurate fair value for an option, option pricing models require you to put in what the future volatility of the stock will be during the life of the option. Naturally, option traders don't know what that will be, so they have to try to guess. To do this, they work the options pricing model "backwards" (to put it in simple terms). After all, you already know the price at which the option is trading

: you can also find the other variables (stock price, interest rates, dividends, and the time left in the option) with just a bit of research. So the only missing number is future volatility, which you can calculate from the equation.

Solving for volatility this way returns the so-called implied volatility, a key measure used by all option traders. It is called implied volatility (IV) because the implication of volatility given by an option's price allows traders to determine what they think future volatility is likely to be.

Traders use SV to gauge if options are cheap or expensive. You may hear option traders say that premium levels are high or that premium levels are low. What they really means is that current IV is high or low. Once you understand this, then you can also determine when it is a good time to buy options—when the premiums are cheap—and when it is a good time to sell option—when they are expensive.

10.8 An Introduction to the Hedging Greeks

In Derivatives explained, we gave you an overview of the ways in which we could make money by trading the cash instrument around an options position. This article will introduce one specific set of techniques for describing the behavioral characteristics of an options position or a portfolio of options, futures, forwards and cash. When we purchase an option, we can trade the cash instrument (called “trading spot” or “trading the cash”), hoping to realize more profit from trading the cash than we pay initially in premium for the option. When we sell an option, we hope that the premium that we are paid upfront dwarfs the losses we will sustain from trading the cash.

When we buy options, we are said to be buying volatility. We make money if the spot rate is volatile enough for us to pay for the option. When we sell options, we are selling volatility. We make money if spot is calm enough that we don't have to hedge the exposure frequently.

However, delta hedging is not the only way for us to make money with options. The genius of derivatives is that it allows us to take positions in (or to hedge against fluctuations in) other aspects of the cash instrument's price evolution. Derivatives are dangerous if we do not understand or address each potential dimension of their risk.

Here are several examples. With a simple plain vanilla option, we can make money if implied volatility moves in our favour. With currency futures, currency forwards and currency options, we can speculate on the spread between interest rates in two different countries for a maturity date. With some exotic options, we can

buy an option that appreciates in value with the passage of time (all other things being constant) and that also appreciates in value with movement lower in implied volatility.

Options dealers and savvy options traders use time-proven techniques to break down the risks in an options position or in a portfolio of options, futures, forwards and cash positions into information that is more readily comprehensible and therefore more easily positioned or hedged. This method of analysis employs tools called the "Greeks", as well as using simulation, scenario analysis and value-at risk analysis.

We shall discuss simulation, scenario analysis and value-at-risk analysis in subsequent articles.

The Greeks get their name from the fact that the sensitivities of an option to various market parameters are labeled with letters from the Greek alphabet.

Delta

The delta of an option is the sensitivity of the option's price to very small changes in the price of the underlying instrument.

When we talked about trading spot around the options position in order to realize profit that would pay for the option's premium, we were talking about trading the delta.

By taking an opposite equal in size to the option's delta, we immunize the option against profit and loss variability due to small changes in the spot rate.

For example, consider our equity call option with a strike price of \$50 when the underlying price is \$50. Because it is an at-the-money option, we know that the delta is 50. The delta is expressed in terms of a percentage of the notional amount. An option that is hopelessly out-of-the money very near to expiration has a delta of 0. Also, near expiration, an option that is completely in-the-money with no danger of being thrown out-of-the money has a delta of 100. Everything else is in between. At-the-money options have a delta of 50.

Our equity call has a positive delta because it is a long position in a call. If we exercise the call, we will end up being long the stock.

An equity put struck at-the-money would have a negative delta of 50. If we exercise the put, we will end up being short the stock.

Similarly, shorting a call implies a negative delta and shorting a put implies a positive delta.

To delta hedge our long at-the-money equity call struck at \$50, we need to know the notional amount. Let it be \$100 for the sake of argument. Therefore the delta position implied by our option is \$50 (i.e. $50/100 \times \$100$).

If we take a short position in the cash market (assuming that shorting the stock is feasible and liquid enough) at the spot price of \$50, we have immunized the option's sensitivity to small changes in the spot price.

If spot goes to \$48, the \$2 we make on the short stock position will offset the \$2 we will lose on the change in price of the option. Similarly, if spot goes to \$52, the \$2 we make on the option premium will be offset by the \$2 we will lose on the short stock position.

Assuming that we own the option, if we plot the curve of the option premium (on the y-axis) against the price of the underlying instrument (on the x-axis), everything else remaining constant, we obtain a convex curve. The slope of this convex curve is the option's delta.

Gamma

Things begin to get interesting for larger moves in the stock price.

If spot goes to \$70, we might expect to make \$1150 on the option price while only losing \$100 on the short stock position.

How does this work?

Because of the convexity of the option's curve, the delta will change if spot moves enough.

If spot goes to \$52, the delta might change to 52. If spot goes to \$55, the delta might change to 57. If spot goes to \$60, the delta might change to 64. If spot goes to \$70, the delta might be 80. The option position behaves as if it is a miraculous trade that seemingly gets longer as spot goes higher in a non-linear fashion.

Since we have only hedged out exposure to a position that is long \$50 at \$50, the hedged option position will continue to make money on the incremental position, i.e. the part that appeared to get longer from \$50 to \$70 at an average rate of say \$65.

The greater the convexity of the option curve, the more bang for our long option buck and the more pain we will endure if we are short the option, in a volatile environment.

Convexity is described by the Greek letter called "gamma".

Mathematically, gamma is the second derivative of the option's price with respect to the underlying cash price. Intuitively, it is the sensitivity of the delta (or rate of change of the delta) with respect to the cash price.

Vega

We know that options will be expensive when volatility is actually high or when volatility is thought to be heading higher. We also know that options are cheap when volatility is low or when volatility is believed to be heading lower.

There are two kinds of volatility between which we must distinguish : actual volatility and implied volatility.

Actual volatility is a measure of how much the spot price moves around, in fact, for a given time period.

Implied volatility is the volatility used in the calculation of the option's price. Without going into the mathematics of it at this point, suffice it to say that we can back out (or "imply") the volatility used to calculate an option's price, if we know with certainty the value of each of the other variables used in the option valuation formula. For the Black-Scholes-Merton model, the list of these remaining variables typically includes the underlying cash price, the maturity date, the delivery date, the strike price and the risk-free rate of interest.

Some of the more developed derivatives markets, such as the foreign exchange options market, actually trade in terms of implied volatility or "vol" instead of specifying a price at which may buy or sell the option in question.

The sensitivity of an option's price to changes in its implied volatility, all other things being constant, is called the "vega".

Let us consider the case where we have just bought and delta hedged the long \$50 equity call in the stock of company ABC Inc. Spot does not move for a couple of hours until a headline tells the market that DEF Inc. has made a hostile bid for ABC Inc.

Even though spot does not move immediately because traders are confused about the implications of the DEF bid, implied volatilities jump much higher because of the additional uncertainty for ABC's future prospects posed by the DEF initiative.

We will make money, not from delta hedging, but from the jump up in the value of the option. We now own something that has become more valuable in the blink of an eye because the market believes that the volatility of the ABC stock price will be greater than previously thought. Pity the poor short option holder.

Other Greeks

There are other Greeks that we will leave for future discussion. For example, “rho” describes the option’s sensitivity to changes in the domestic interest rate.

In the next article, we will describe some of the ways in which understanding the Greeks can get tricky. Apparently, simple positions can look very complex very quickly.

10.9 Technical Analysis and Derivatives Trading

In making decisions about where and when to take a position, investors, traders and analysts use two different approaches : fundamental analysis and technical analysis. Fundamental analysis is the appreciation of the economics underlying a particular trade. If you want to know where to invest and why, you use the techniques of fundamental analysis. Technical analysis is concerned with the when and the how of placing money. It determines the optimal timing for a position and its conclusions about how long to stay in a particular trade have significant importance for the kind of derivatives structure one may use to take a position. For a foreign exchange trader, fundamental analysis is focused on the macroeconomics of the particular currencies involved, including the implications of the current account, the GDP growth rate, domestic consumption, domestic production and other political factors that influence the currency’s relative value. As we move into more company-specific investments such as individual equities, fundamental analysis becomes more preoccupied with microeconomic questions related to the firm. Such an investigation might look at price/earnings ratios, debt/equity ratios, cash flow forecasts and similar data from financial statements, press releases and competitors.

Technical analysis is an art in which quasi-statistical techniques and formal statistics are used to determine the existence and strength of trends in financial time series and to identify turning points in these trends. If you can do this with a reasonable degree of accuracy, then you can improve your chances of making a profitable trade. Technical analysis is important in the structuring of derivative products because of the leverage involved and because of the inclusion of such features as barriers and compound strikes. Timing is everything.

10.10 Examples of Technical Analysis

There are two kinds to technical analysis.

First, there is the design and use of “indicators”, changes in which present implications about the existence, strength or change in the trend of the financial time series in question. An indicator is a function of the time series and some parameters that the analyst chooses.

Second, there is the use of more primitive hands-on techniques such as the drawing of “support” and “resistance” lines on a chart, the violation of which is deemed to be a significant technical event. In its more complex manifestations, “patterns” are interpolated from market behaviour with conclusions for future price evolution based upon the historical consequences of such patterns.

There is a growing voice in technical analysis that argues against this second school of thought. The argument against interpolating lines and patterns comes from a basic assumption about the psychology of money. In order for technical analysis to be successful in forecasting future price movements, the analysis must be objective. Otherwise, the analyst will see what he wants to see. I myself have seen traders, especially ones with large positions that have started to lose money, fool themselves into thinking that they can justify their current positions with some lines on a chart. Hope is the principal obstacle to profitable trading.

Presume then those derivatives traders who use technical analysis stick firmly to the first school, the use of indicators.

Advances in computer technology make it easy to automate this analysis by programming what are called expert rules. This obviates the problem of seeing what one wants to see quite clearly. And it allows the analyst to customize the indicator to time series in question in order to get the most optimal results.

For example, a momentum indicator is a simple formula involving the most recent price and some historical price that gauges the speed of the move in the financial time series.

A moving average is simply an average over the last few periods for the time series. Construct two moving averages with different periods and you have a trading signal when they cross. When the moving average with the longer indicator crosses the moving average with the shorter indicator, you have a good indicator of a trend in place.

10.11 Technical Analysis and Derivatives in Practice

In practice, there are quite a few indicators that we can look at and that we can automate to produce trading signals when the rules we specify are triggered.

For example, we could design an Expert System that produces a trading signal every time our Moving Average Crossover system indicates that the two moving averages intersect.

The more indicators we have the better our picture will be. Some indicators are more suited for trending markets while other indicators are oriented towards consolidating markets.

If we can have a set of indicators that produce a consistent trading signal, then we have reduced the probability of being wrong about the trade.

If we have five automated trending signals, all of which indicate that our stock is in an upward trend that is a pretty interesting result.

It is even more interesting if the technical analysis confirms the picture our fundamental analysis paints. If the fundamental analysis suggests that this company is seriously undervalued, we would feel even more comfortable buying it.

If the technical indicators about the speed of the trend suggest an explosive move, we could use a structure with a highly leveraged payout for an explosive move to the upside. For example, we could use a very low delta call (i.e. a highly out-of-the-money call) on the stock if we thought its price would explode to the upside out of a well-defined range. Not only would we make money on the direction of the spot and the convexity of the spot movement but we would also make money from the rise in implied volatilities.

Or, we could attach a barrier on the downside to our out-of-the-money call if we were confident that spot would not move below a certain level before going higher. This would make the option cheaper and increase the leverage in the structure.

Or, we could attach a binary to the option enabling us to get the out-of-the-money option for free as long as spot did not close below the binary level at maturity.

One can see very quickly how flexible derivative products enable our investing approach to be.

The corollary to this argument is that it is dangerous to put on such derivatives structures without some combination of technical and fundamental analysis. Derivatives have the potential for tremendous gains but they require much more homework because of the leverage of the structures, the possibly reduced liquidity and the larger bid/offer spreads involved in transacting them.

Technical analysis and fundamental analysis are tools that the analyst and the trader can use to reduce the uncertainty involved in taking a position. The skilled trader will use these techniques to wait for the right opportunity and to structure the most profitable derivative strategy to take advantage of it.

10.12 Options Markets

There several different trading plat forms and for trading options.

Exchanges

In the United states most options trade on one of the five exchanges : the Chicago Board Options Exchange (CBOE), the American Stock Exchange (AMEX). The International Securities (ISE) is the first entirely electornic options market in the United States. Open for trading since May 2000, the ISE initially listed options on three stocks. In March 2001 the figure was up to about 200, with plans to expand the list to 600 different companies. The ISE states that its mission is to “create and maintain an efficient cost effective and liquid market for stock options through the introduction of a new market structure and automated trading systems”. The Risk Waters group named the ISE the 2001 Derivative Exchange of the year in recognition of the innovations it had made in the derivative industry.

Well-regulated options exchange similar to the COBE exist in Australia, Sao Paulo, Canada, Amsterdam, Hong Kong, Osaka, Manila, Singapore, Sydney, the United Kindom, and many other countries.

Over-the-Counter Options

Besides trading options on the exchanges, it is also possible to enter into “private” option arrangements with brokerage firms or other dealers. Institutions some times do this when they need a product with characteristics that are not available in an exchange-traded product. The striking price, life of the option, and premium are negotiated between the parties involved. This is called an over-the-counter option. Because the OCC does not get involved with an OTC option they are subject to counterparty’s risk. This the possibility that the other side of the trade (perhaps a large commercial bank or investment house) will be unable to perform as agreed if the option is exercised. If for instance my firm busy 100 contracts of a particular OTC option, I assume that if I exercise the option the writer will deliver shares to me as agreed. There is the possible that the counterparty will be unable to perform in accordance with the option contract.

Review

An option is a contract giving the buyer the right but not the obligation to buy or sell an underlying asset at a specific price on or before a certain date.

- Options are derivatives because they derive their value from an underlying asset.
- A call gives the holder the right to buy an asset at a certain price within a specific period of time.
- A put gives the holder the right to sell an asset at a certain price within a specific period of time.
- There are four types of participants in options markets : buyers of calls, sellers of calls, buyers of puts, and sellers of puts.
- Buyers are often referred to as holders and sellers are also referred to as writers.
- The price at which an underlying stock can be purchased or sold is called the strike price.
- The total cost of an option is called the premium, which is determined by factors including the stock price, strike price, and time remaining until expiration.
- A stock option contract represents 100 shares of the underlying stock.
- Investors use options both to speculate and hedge risk.
- Employee stock options are different from listed options because they are a contract between the company and the holder. (Employee stock options do not involve any third parties.)
- The two main classifications of options are American and European.
- Long term options are known as LEAPS.

10.13 Questions

1. What is asset derivative? How is it related to the underlying asset?
2. Discuss the basic features of different types of options.
3. Explain the following : Delta; Gamma and Vega.
4. What is LEAPS? How does it help in hedging?
5. Describe some of the important options markets.
6. Examine the rights and obligations under different option types.
7. How does volatility and time effect influence the pricing of an option?

Short Question

8. Can you distinguish between speculation and hedging?

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Unit 11 □ Forward and Future Contracts-Valuation- Stock Index Futures

Structure

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11.1 Introduction

The most commonly used derivative contracts are forwards, futures and options. Options have been discussed in the earlier chapter.

11.2 Forward Contracts

A forward contract is an agreement to exchange an asset for cash, at a predetermined future date specified to-day.

An over-the-counter obligation to buy or sell a financial instrument or to make a payment at some point in the future, the details of which were settled privately between the two counterparties. Forward contracts generally are arranged to have zero mark-to-market value at inception, although they may be off-market. Examples include forward foreign exchange contracts in which one party is obligated buy foreign exchange from another party at a fixed rate for delivery on a pre-set date.

Off-market forward contracts are used often in structured combinations, with the value on the forward contract offsetting the value of the other instruments(s).

A forward contract is a bilateral contract in which the buyer and the seller agree upon the delivery of a specified quality and quantity of assets at a specified future date at a predetermined price. Forward contracts are typical OTC derivatives. As the name itself suggests forwards are transactions involving delivery of an asset or a financial instrument at a future date. One of the first modern 'to arrive' contracts—as forward contracts were known—was agreed at Chicago Board of Trade in March 1851 for maize corn to be delivered in June of the year. From then on, the market has developed tremendously, taking in to account the needs of the market players. Consequently, we have today, forward contracts on a variety of commodities and underlying assets including :

- Metal
 - Energy Products
 - Interest rates
 - Exchange Foreign
- (Foreign exchange, purchased in advance, is called forward exchange.)

11.2.1 Characteristics of Forward Contracts

The main characteristics of forward contracts are given below :

- They are OTC contracts.
- Both the buyer and seller are committed to the contracts. In other words, they have to take delivery and deliver respectively, the underlying asset on which the forward contract was entered into. As such, they do not have the discretion as regular completion of the contract.
- Forwards are price-fixing in nature. Both the buyer and seller of a forward contract are fixing to the price decided upfront. For instance, if we propose to sell one US dollar to a bank, one month forward at say Rs. 43.75, we have to sell at the same rate to the bank on the delivery date, irrespective of the fact where the market rate is. Thus, if on the delivery date the market price is Rs 43.50, we stand to gain Rs 0.25. On the other hand, if the market price is Rs 44.00, we stand to lose Rs 0.25. In both the instances, the customer and the bank are duty—bound to deliver and delivery of the US dollar respectively, independent and irrespective of whether they stand to gain or lose. In other words, the parties to a forward contract are committed to fulfill their respective obligation.

- Due to the above two reasons, the pay-off profiles of the borrower and seller, in a forward contract, are linear to the price of the underlying.
- The presence of credit risk in forward contracts makes parties wary of each other. Consequently, forward contracts are entered into between parties who have good credit standing. Hence, forward contracts are not available to the common man.

11.2.2 Forward Rate Agreements (Fras)

A forward rate agreement is a cash-settled obligation on interest rates for a pre-set period on a pre-set interest rate index with a forward start date. A 3x6 FRA on US dollar LIBOR (the London Inter Bank Offered Rate) is a contract between two parties obliging one to pay the other the difference between the FRA rate and the actual LIBOR rate observed for that period. An Interest Rate Swap is a strip of FRAs.

11.2.3 Determining forward Prices

In the principle, the forward price for an asset would be equal to the spot or the transaction and the 'cost-of-carry'. The cost-of-carry includes all the costs to be incurred for carrying the asset forward in time. Depending upon the type of asset or commodity, the cost-of-carry takes into account the payments and receipts for storage, transport costs, interest payments, dividend receipts, capital appreciation etc. Thus,

$$\text{Forward Price} = \text{Spot or the Cash Price} + \text{Cost-of-Carry.}$$

11.3 Futures/Future Contracts

An exchange-traded obligation to buy or sell a financial instrument or to make a payment at one of the exchange's fixed delivery dates, the details of which are transparent publicly on the trading floor and for which contract settlement takes place through the exchange's clearing house.

Futures have evolved out of forwards and are exchange-traded version of forward contracts. They are one of the most popular and widely used derivative instruments.

A futures contract can simplistically be define as an agreement to buy or sell an asset as a certain price. A more comprehensive definition would be as follows. Futures are firm financial agreement to deliver (sell) or take delivery (buy) of a

standardized quantity of an underlying commodity/instrument, at a pre-established price agree on a regulated exchange at a specified future date.

11.3.1 Types of Futures Contracts

Depending on the underlying upon which futures are constructed and traded, there are four major types :

- Commodity futures are those in which the underlying asset is a commodity like wheat corn, soybeans or a perishable commodity like port bellies; or even precious assets like gold, silver etc.
- Financial futures are those where the underlying assets are financial instrument like money market paper, T. bills. Notes, bonds etc.
- Currency futures are those in which the underlying assets are major convertible currencies like the U.S. dollar, the Pound sterling, the Euro and the Yet etc.
- Index futures are those underlying assets in an index. Most, but not all of these contracts are for stock indices. The more famous of the indices on which futures are traded are Standard and Poor's 500, the New York Stock Exchange index and Tokyo's Nikkei index and such others.

Financial and currency futures are widely used by financial institution like banks, hedge/pension funds worldwide to hedge their price risks. Markets in financial futures contracts are a relatively new phenomenon. The first contracts were currency futures in which trading began in 1972 on the International Monetary Market (IMM), which is a part of the Chicago Mercantile exchange (CME). Since 1972, the growth of these markets both geographically and in terms of instruments has been rapid. The main difference between commodity and financial futures contracts are that the latter involves cash settlement at delivery date instead of physical delivery. Even where physical delivery is allowed few financial futures are settled in that manner.

11.3.2 Characteristics of Future Contracts

Futures are essentially exchange-traded versions of forward contracts. Financial analysts' desire to replicate a cash market strategy without the concomitant credit risk resulted in the development of futures. The future exchanges are highly regulated worldwide and come under the supervisory purview of government in various countries.

The credit risk is sought to be eliminated through the system of margin requirements by the clearing houses established by all the future exchanges. The clearing house may be a subsidiary of the exchange itself or an independent corporation. The clearing house stands as a counter party for each and every

transaction undertaking on the futures market. In other words, the clearing house becomes a seller for every buyer for every seller.

Once a trade is confirmed, the clearing house guarantees fulfillment of each contract. To support this guarantee, the clearing house sets membership standards, operates a margining system, monitors daily positions, and maintains a guarantee fund that can be called upon in the event of default by one/more members. Under the margining system, the individual buyer and seller and required to post the daily margins, for the purpose of marking-to-market the futures contracts on a daily basis.

An exchange-traded contract is a price fixing contract in as much as the buyer/seller is obligated to take/give delivery or close-out position at the pre-agree price for the purpose of settlement. As such, the pay-off profiles of the buyer and seller are symmetric (like that of forward contracts).

11.4 Futures and Options Compared

| Futures | Options |
|-----------------------------------|---------------------------------|
| Exchange traded, with naration | Same as futures |
| Exange defines the product | Same as futures |
| Price is zero, strike price moves | Price moves, strike price fixed |
| Price is zero | Price always positive |
| Linear pay-off | Non-linear pay-off |
| Both long and short at risk | Only short at risk |

11.5 Fowards and Futures Compared

Fowards and Futures have much in common. Both are present contracts that commit one party to deliver certain goods, merchandise currency, etc. and the other to pay with the delivery and the payment to take place at a later date.

Forwards

Today you agree to sell your car to somebody when you return from vacation. Assuming this has all the elements of a contract, you have entered into a forward contract. You car is not, of course, the sort of thing we have in mind when we talk about derivatives so that transaction will not be explored further here.

Suppose your company anticipates needing 400 million English pounds six months from now. You, the CFO, are quite comfortable with the current exchange rate between dollars and pounds and you are even comfortable with the exchange rate which various experts in the currency markets think will prevail six months hence. What you are not comfortable with is the experts and their predictions. You know that there is some volatility in the foreign exchange markets and you feel that the potential change in these rates over the next six months adds an elements of risk to your business that you would like to avoid. Accordingly you enter into a contract today with a financial institution (possibly a large local bank or possibly an English bank) to buy 400 million pounds from the intuition six months hence at a price, specified now, a price specified in US dollars. You have entered into a forward contract involving the price of English pounds in terms of dollar (the “underlying”) for 400 million of those pounds (the “notional amount”). This contract is a derivative contract.

Futures

Your company, a large food processing company, will also be buying a large quantity of No. 2 Hard Red Winter wheat a few months after the harvest season and you and your purchasing agent are nervous about what the price of that wheat may be. If, for example, the intervening harvest is bad, the price of wheat may soar with detrimental effects on your company’s income. You enter into futures contracts involving several million bushels of No. 2 Hard Red Winter wheat to be completed shortly after the time you will need the wheat. So far the forward contract for English pounds and the futures contract for wheat sound identical and certainly they have much in common. Both contracts are derivatives that contemplate a future transfer of something (a foreign currency, a commodity, etc.) in exchange for a payment at that later date.

There are, however, some important differences.

| | |
|------------------------------|---|
| Organized exchanges | Futures contracts are always traded on an organized exchange such as the Chicago Board of Trade or the Chicago Mercantile Exchange in the USA. |
| Standardized Packages | Whereas a forward contract is for whatever quantity, date, etc. the parties negotiate, a futures contract is a standardized package. The wheat futures are for 5,000 bushels (not 5, 100 bushels) and the expiration months are July, September, December, March and May. The quality, delivery terms, minimum price fluctuations, daily price limits, trading hours, etc. are all established. |

The
Clearing
house

While the futures transaction does take place between a buyer of the commodity, metal, financial instrument (the “long”) and the seller (the “short”), a clearinghouse immediately steps in between the two parties. The buyer and seller both look to the clearinghouse to live up to the terms of the contract. If the seller wants delivery of the commodity, it is the exchange that will find a counterparty (necessarily and only rarely the original counterparty) to live up to the other side of the deal.

Regulation

While everything about modern life is regulated—the state is everywhere—futures markets are more tightly regulated than forward markets. For example, the types of futures contracts to be offered on the various exchanges must be approved by a regulatory authority such as, in the US, the Commodity Futures Trading Commission (CFTC).

Among the dozen or so other significant differences between forwards and futures, one that deserves particular comment is how the contracts are completed, settled or terminated. While forward contracts are usually settled by performance, it is rare for the parties to a futures contract to ever complete the contract by making delivery of the wheat, metal etc. A forward contract might involve a deal between a US manufacturer and the Bank of Montreal to buy a certain number of Canadian dollars at a later date in most cases, when that date arrives, this being a forward contract, the US company will pay so many US dollars to the Bank of Montreal and the Bank of Montreal will “deliver” or credit the agreed upon number of Canadian dollar to an account for the US manufacturer.

By contrast, in a futures contract, it is rare for the “long” to expect to accept delivery and it is unusual for the “short” to plan to deliver. Both parties will terminate their position by making a contrary trade. The buyer in the futures contract (the “long”) will, at some later date, when the futures contract has fulfilled its purpose, make an offsetting sale and the clearinghouse will offset his purchase and his sale and his position has been closed. (His sale will, by the way, typically bring another party into the market, the counterparty to his sale and that counterparty will now be long.) At a later date, the original seller (the “short”) may likewise decide that the arrangement has fulfilled her purpose and she may then make a purchase of the same futures contract; again, the exchange offsets her short and long positions and she too is out of the market. Depending on the type of futures contract, only one to five percent are settled by delivery of the notional amount of the underlying.

To illustrate, suppose a flour company will need 500,000 bushels of wheat several months hence and is nervous about the prospective price of wheat at that time. What will that price be? The miller can look at the current futures price for, say, September wheat and can get some idea of what informed traders think that price will be. Unfortunately, September being still many months off, a bad harvest, changes in government policy, an international crisis, and many other factors may affect that price. If the miller is satisfied with the current futures price and does not want to take his chances on the changes that may occur in that price in future months, the miller can buy 100 contracts of September wheat. (Recall that a wheat contract is for 5,000 bushels so that 100 contracts will be for 500,000 bushels.)

Suppose wheat prices rise between now and September and October when the miller needs the wheat. (And suppose that increase in price takes the September "spot" or "cash" price above the futures price at which the miller contracted.) Chances are the miller will buy his wheat through the normal channels that he buys wheat and will pay the higher prevailing price for wheat at that time. (That's BAD.) But sometime in September the miller will have sold his 100 contracts of September wheat. Since these contracts give the right to buy wheat at the lower price at which wheat was selling several months in the past, the contracts have a value and the miller will make a profit. (That's GOOD.) The miller probably paid nothing when he entered into the futures contract in the past. (There will, of course, be some commissions to be paid and margin will typically have to be posted). When the miller closes his contract by selling it in September, he will receive money and that money will largely offset the increase in price the miller will have to pay for the wheat, the increase, that is, over an above the futures price prevailing at the time of the wheat, the increase, that is, over an above the futures price prevailing at the time of the initial contract. The miller has thereby insulated himself from the higher price and the consequent loss.

He has, of course, also insulated himself from the gain that would have occurred if the price of September wheat had gone down below what the September future implied at the time of the original contract. Had he not entered into the futures contract, he would now be able to buy the wheat at the lower price. Yes, he will still buy the wheat at the lower price but, to settle his September futures contract, a contract to buy wheat at the higher September price contemplated several months ago, he will have to pay money. The reduced price he pays for the wheat in September will be offset by the amount he must pay to get out of his futures contract.

Note that whether the spot price in September exceeds or falls below the September futures price that prevailed months ago, the miller's net position will be that he neither gains nor loses from that price movement. Notice also that in neither case will he typically accept delivery on the futures contract. Yes, the exchanges do have mechanisms for delivery to take place by warehouse receipts being delivered but actual delivery is rare. The miller buys wheat through normal channels and simply uses the futures contract to "hedge" against an unfavourable movement in prices recognizing at the same time that he is forsaking the opportunity to profit from a favourable movement of prices.

A Speculation

Let's plug in some numbers and deal with a concrete example involving a speculation. Brian, on the basis of some through research (he has spoken to his astrologer, consulted the tea leaves and purchased a perfect crystal ball) knows that the price of a particular commodity will increase considerably by December.

| A SPECULATION | | |
|---------------|------------|-------------------|
| DATE | SPOT PRICE | DEC. FUTURE PRICE |
| March 31 | \$5 | \$5.50 |
| December | ? | ? |

Brian is not alone in believing that the price will rise. Note that the December futures price for a bushel of this commodity is \$5.50 or ten percent more than the current "spot" price (also called the "cash" price). But Brian knows that the market underestimates the prospective increase in price. By December when the futures contract expires-at which time the unknown spot and futures prices will be the same (they converge as they approach expiration)-Brian knows that the commodity will sell for at least \$6 a bushel.

Here is his March 31 transaction. He buys 100 contracts of December futures at the futures price of \$5.50 a bushel. Let's suppose the contract for this commodity is for 5,000 bushels so Brian is contracting to buy 500,000 bushels in December at \$5.50 a bushel. He won't have to pay the \$5.50 now; he is contracting to pay \$5.50 a bushel in December. Yes, some money will trade hands now. He will have to pay commissions and other transaction costs. Also his broker and the exchange will want assurance that when December comes Brian can perform his part of the bargain;

namely the brokerage firm will require Brian to post “margin” so they can be sure Brian can pay the \$2,750,000 his contract implies. (The margin will, however, only be a very small part of the \$2,750,000. The exchange will only be concerned with getting a part of the extent to which the price goes up or down. The position can always be liquidated so that the exchange doesn’t need to worry about the full \$2,750,000 but only about the extent to which that number will fluctuate.) The futures market has a complicated system of initial margin, maintenance margin and variation margin that you will have to check out before you enter into a futures transaction. For simplicity, let’s suppose that Brian has lots of securities and funds on deposit with his broker so that no further margin need be posted.

Comes December and as the contract approaches expiration-the futures price and the spot price converge to \$5.40. The tea leaves was mistaken. Brian decides to tear up his futures contract and tells his broker not to bother getting the 500,000 bushels. His broker, however, reluctantly explains to him that a futures contract is not quite the same as, say, a call option. If you buy a call on some stock at \$50 and the price of the stock drops to \$45 as the option is about to expire, you just let your option expire worthless. The option gives the buyer the right but not the obligation to buy the stock at \$50. By contrast, Brian must-unless he does something to settle that contract-pay \$2,750,000 for 500,000 bushels of the commodity. If he goes through with the contract, he may then turn around and sell the commodity on the spot market for the prevailing price of \$5.40 or a total of \$2,700,000. Notice that Brian pays \$2,750,000 for the 500,000 bushels and then sells it for \$2,700,000. He has lost \$50,000 on the transaction.

Will Brian actually accept delivery? Probably not. His broker informs him that he can get a warehouse receipt delivered to him within the next day or two and Brian takes a good look at his garage and basement and decides he doesn’t want to go through with the deal “What can I do?” he asks his broker. She explains to him that he can close his position by making an offsetting trade. He has bought December futures; he can now sell December futures for the same number of contracts of the same commodity and he is out of the market. Unfortunately, he is selling an obligation to buy the commodity at \$5.50 and the commodity is only worth \$5.40. To get out of the position he will have to pay the difference of \$0.10 per bushel or \$50,000. Anyway you look at it, Brian has lost \$50,000.

A Hedge

Who was on the other side of Brian’s deal? At the inception of a futures contract there is counterparty. True, after the deal is made, the clearinghouse steps in between

the two parties and is, in a sense, the counterparty for both the long (Brian) and the short. But even then there are as many contracts long as there are short and the clearinghouse is just a traffic cop between the longs and the shorts. There is still, in a sense, counterparty to Brian's contract and the only problem is that Brian doesn't know the identity of that counterparty. (For that matter, he won't know the counterparty when he made the original deal. It would have been handled for him by his broker and the exchange.)

Let's say the counterparty when Brian made his original deal was a merchant that had a large inventory of the commodity that it did not expect to sell until December. This counterparty, unacquainted with scientific decision theory, had not done the same market research as Brian and did not have any strong opinion about what the price would be in December. Furthermore, it didn't want to have to worry about what that price would be. It was satisfied with the \$5.50 that some market participants forecasted would prevail in December. It wanted to "lock in" a price of \$5.50 and it wanted to isolate itself from the risks involved in the fluctuations in that commodity's price. It didn't want its inventory to go down in value if the December price were lower than the March price and it was willing to forego any profit that would eventuate if the December price exceeded \$5.50. Accordingly it sold 100 futures contracts of 5,000 bushels each for December delivery at \$5.50.

When December arrives, the spot and futures prices for the commodity converge, as noted above, at \$5.40. Does the company actually deliver the commodity and collect the \$5.40 per bushel? Chances are it does not. In all likelihood, it sells its 500,000 bushels in the normal channels it usually employs and gets only \$700,000 for it. That's less, \$50,000 less, than the \$2,750,000 that market participants back in March were predicting would be realized in December. But offsetting this \$50,000 loss is a \$50,000 gain on the futures contracts. The company sells these contracts at \$0.50 a bushel since they provide for delivery at \$5.50 when the prevailing price is only \$5.40. The company ends up with the same net effect as if it had been able to sell the commodity in December at the predicted \$5.50.

What would have happened if the December spot price had been \$6 as Brian had anticipated? Presumably the company is able to sell its inventory at \$3,000,000 instead of the \$2,750,000 that market pundits would have predicted back in March. That \$250,000 "gain" is good. But there is an offsetting loss on the futures contract of \$250,000. Having sold a futures contract back in March and thereby committing itself to sell the commodity at \$5.50 a bushel, it wants to "undo" the

contract by buying a contract it will have to pay \$0.50 a bushel. Bear in mind that it is getting rid of a obligation to sell a commodity at \$5.50 when the going price is \$6 a bushel. The offsetting loss again means that the deal made back in March gives the company the opportunity to lock in the price of \$5.50 that informed participants in the market thought would prevail in December.

In a sense, if we ignore transaction costs, the futures market may be considered a “zero sum game.” The \$50,000 loss of Brian matches up with a \$50,000 gain to the merchant. And the potential gain of \$250,000 to Brian would correspond to a \$250,000 loss to the merchant. What one party loses the other gains?

Notice a very significant difference between the speculator and the merchant. The speculator is entering a very risky market. Brian’s loss was \$50,000 and the gain, had the spot price been \$6 in November, would have been \$250,000. Those are substantial losses and gains when you bear in mind that the initial contract, ignoring transaction costs and margin, involved no outlay by Brian. If we measure risk by how much the outcomes may differ from the expectation, futures markets (and derivatives in general) tend to be very risky for the speculator.

By contrast, the merchant, instead of increasing his exposure to risk by entering into a futures contract, is reducing it. He is “hedging” his bets or reducing his risk. He will not be hurt by the bad outcome but, on the other hand, he will not benefit from the good outcome.

11.6 Players and Purposes

Now let’s explore who are the “players” in these derivatives markets and let’s ask whether these markets fulfill any “purpose.” Who would get involved in these transactions and is there any excuse for the existence of these markets?

Players

There are a great number of players in derivatives markets, including regulatory agencies (such as the SEC and the Commodity Futures Trading Commission in the USA and SEBI in India, the exchanges, the clearing houses, brokers, futures commission merchants... and many others. Some of these have been mentioned in previous pages. Only three will be further discussed here : hedgers, speculators, and arbitrageurs. In India the total turnover in the derivative market reached Rs. 21,921 crore by January 28, 2004.

Hedgers

The primary motive of the hedger is to reduce risk, not to make profit.

Vicki has a large portfolio of stocks and her portfolio looks a lot like the Standard & Poor's 500. She suspects that the market bears a striking similarity to a bubble and, while not wanting to incur the substantial transaction costs and the big taxes that liquidating her portfolio might entail, she wants to protect herself somewhat from a precipitous plummet in prices. She is considering buying index puts on the S & P 500. She will find that the "premiums" on this kind of insurance are quite high and that, unless she keeps renewing the puts, the insurance is very definitely short term. Nevertheless, it is clear that Vicki is trying to "hedge," or "cover" her bets. Her motive is to reduce the risk implicit in a large portfolio of stocks in an inflated market.

Old McDonald has planted many acres of wheat and is very nervous that when it reaches the market in September the price may be quite different, possibly much lower, than the commodities markets now predict for September wheat. If he can sell the wheat at the futures price for September wheat, he will be well satisfied. He sells, goes short, on September wheat. He is trying to reduce the risk of a substantial loss from a bad spot price in September. In return he is willing to forego the profit from a high spot price in September. Old McDonald is trying to reduce the risk relating to his prospective harvest.

While the primary motive of the hedger is to reduce risk, note that return may also be involved. Let's say that Old McDonald considers wheat to be a crop on which the return is far better than the return on, say, watermelon but that the higher return on wheat is also fraught with a great deal more risk. If he couldn't do something to reduce that risk, perhaps he wouldn't pursue the higher return and would instead stick to watermelon. Thanks to the prospect of reducing that risk by futures transactions, possibly Old McDonald will plant wheat rather than watermelon. Risk reduction may be the obvious motive for many who hedge with derivatives but a trade-off between risk and return is also present.

Speculators

Joan, poor Joan, has a net worth of only \$1 million. Many people would be well satisfied with that net worth but Joan has the misfortune to travel in the company of basketball players, movie stars and political bigwigs to whom \$1 million is petty cash. Joan was gorgeous at 40 but now at 60 cracks are beginning to mar the makeup

and she is desperate to catch up financially with her “connections.” They loved her when she was beautiful, will they still love her when she is old and poor?

She can invest her \$1 million in the stock market or in carefully selected real estate but she doesn't believe the “irrational exuberance” of the 'nineties is likely to be duplicated again in her lifetime. Yes, as a devotee of the “common stock theory of investment,” she believes stocks will, in the long run continue to earn ten to twelve percent a year but even at 12 percent, it will take her six years to double her net worth. But even six years will stretch to ten because she has to pay taxes and living expenses out of the 12 percent. So she will be 70 before she has a net worth of \$2 million and most of her friends are already far above \$2 million. She will be 80 before she's worth \$4 million and at 80 it will take more than \$4 million to make a splash on Sunset Boulevard.

Joan has decided to get more bang for her buck by speculating with derivatives. She is going to buy calls on carefully selected high-tech stocks and she will research her tea leaves and take positions in the futures market. Yes, Joan, derivatives don't require a very big investment in relation to the gains they can bring. Yes, with luck you can make a 100 percent return on your investment in a year. But bear in mind, Joan, that the losses can just as easily be 100 percent.

Do the derivative markets provide a service to the speculator? Perhaps. If you like poker and betting on the horses, you can get some of the same adrenaline highs from the derivative markets.

It is also possible that in some areas of the derivative markets there may be a higher return than in safer investments. It is a common place of finance theory that efficient markets may award a higher return to those areas of investment that has higher risk. It is possible therefore that the returns may be high in some areas of the derivatives markets. Possible.

Does the speculator provide a service to the derivative markets? Again perhaps. The speculator may add an element of liquidity that the market might not otherwise have. Given that the derivative markets may provide a social good, the speculator may be providing a social service.

Since every futures sale, for example, must have a futures purchase, it may be useful for these markets to have speculators who can complete the transactions. Old McDonald, anxious to sell September wheat, needs a buyer. If the millers and bakers don't want to buy, it may help the market if Joan is there to enter into the other side of the transaction.

Arbitrageurs

Whenever a future's price deviates substantially from its fair value, arbitrage opportunities arise. The arbitrageur may be considered as a special kind of speculators. Exploring the relationship between the prices and characteristics of various commodities, financial instruments and related derivatives and finding a misalignment, he attempts to exploit that misalignment by buying the underpriced instruments and selling the overpriced. Doing so he puts upward pressure on the underpriced instruments and downward pressure on the overpriced.

Suppose, for the sake of an unrealistically simple illustration, there is a convertible debenture selling on the market at \$1,000 and that the stock into which it is convertible is worth \$1,500. (The conversion privilege in this case is sometimes referred to as an "embedded" derivative; it is embedded inside a debenture). Clearly there is a misalignment of prices here. If the stock is really worth \$1,500 then the debentures must be worth more than \$1,000 and presumably they are worth \$1,500. If the debentures are really worth only \$1,000 then the stock cannot be worth \$1,500. Something is out of line here.

The arbitrageur in this situation might buy the debentures, immediately exercise the conversion privilege, receive the stock and immediately sell the stock. The arbitrageur pays out \$1,000 for the debentures and receives \$1,500 from the sale of the stock and is ahead \$500 from the series of transactions. Note that he is not going to stop with the purchase of one debenture and the sale of the related stock. he is going to keep buying the debentures, exercising, receiving and selling until the prices get back in line. Note that his continuing purchase of the debentures will have the effect of pushing up the price of the debentures and his continuing sale of the common will depress the price of the common. Eventually there will come a time when the alignment of prices is such that he cannot continue to profit from this course of action.

Does his course of action require a very large investment? Not particularly. Note that if she moves quickly her money is tied up only a short period of time between the settlement on the debentures and the receipt of the proceeds from the sale of the stock. If she can buy the debentures and sell the stock simultaneously it is possible he can manage to simply offset the \$1,000 and the \$1,500 on settlement day and walk away with her \$500 gain.

Is risk involved? Perhaps. If he cannot sell the stock at the same time as he buys the debentures, it is possible the stock price will decline between the time when he

buys the debentures and when he sells the stock. Nevertheless, a nimble arbitrageur would usually not consider this a particularly risky situation.

Arbitrageurs are always on the lookout for what is called “academic arbitrage.” Academic arbitrage involves situations in which there is a zero outlay on day 1 and a positive gain on day 2 and where there is no risk involved. You will sometimes find discussions of misalignments between the price of a put and call and of the underlying stock such that, at the “risk-free” interest rate an arbitrageur can make a certain profit in a short period with a zero investment. These discussions turn up in finance textbooks and that is why this arbitrage is called “academic.”

There are thousands of investors, mutual funds, and brokerage firms tracking the relationships between various securities and watching for arbitrage opportunities. If they discover an arbitrage opportunity they will usually exploit it promptly and, in exploiting it, will usually correct the mismatch that lead to the opportunity. Don’t spend too much time looking for a convertible debenture selling at less than the stock into which it is convertible. Such a mismatch is too obvious and too easy to spot. More subtle relations are likely to exist at various times but as soon as a misalignment is discovered and somebody writes an article about it, the misalignment tends to disappear.

While it was said above that the arbitrageur may be considered a special case of the speculator that statement is very much open to challenge as the motives of the two tend to differ. The speculator seeks a high return and tends to be willing to accept considerable risk. While the arbitrageur also seeks a substantial return, he seeks to do so by exploiting opportunities with little or no risk.

While there isn’t any risk in arbitrage that truly meets the definition of “academic” (in fact the absence of risk is the essence of the definition), when one strays from the “academic” to the “real world” of arbitrage, risk can indeed be present. The near collapse of long Term Capital Management (LTCM) in the Summer of 1998 illustrates the point. Many of the backers of LTCM were distinguished economists well versed in academic arbitrage and one of the purposes of LTCM was to exploit arbitrage opportunities in a variety of financial markets. Unfortunately arbitrage opportunities that are completely risk free are very difficult to find and LTCM apparently engaged in operations that had some risk. LTCM promptly proved that it is possible to lose money while exploiting arbitrage opportunities that are “almost” risk free. The losses of LTCM created a near panic on Wall Street and required intervention and assistance from some of the major players in the world of finance.

Does the arbitrageur perform an important function for financial markets? Probably. If we think that markets should be efficient, if we think that the price of puts and calls and of the underlying stocks should be closely related, if we think that it shouldn't be possible to make a more-or-less certain profit by buying the convertible debentures and exercising, if we think logic and reason should prevail with regard to spot prices and futures prices, then certainly the arbitrageur plays an important role in the field of finance.

Purposes

From the above discussion of the activities of hedgers, speculators and arbitrageurs, some of the purposes and social role of the derivative markets can be stated or inferred. Let's review those purposes and then state another purpose that may not be quite so apparent.

Yes, derivative markets may provide a source of excitement and entertainment for the speculators and other participants. It is difficult to consider this role a great social "good," however, since one can derive as much "high" with usually less expense from the rides at an amusement park.

By providing a means to reduce risk, the derivatives markets unquestionably provide an important service to the hedgers and to society as a whole. Derivatives make it possible for the hedgers to operate and for society to profit from the goods and services that might not otherwise be produced and performed.

11.7 Price Discovery

There is another service that derivative markets provide. They may give clues about future interest rates, commodity prices, etc. that would not otherwise be available.

This price discovery role is particularly apparent in the futures markets. There many well-informed players are placing bets on what those future prices will be and the consensus of their opinions tends to be reflected in futures prices. What farmers and bakers think will be the price of wheat several months in the future can be gleaned from the price at which futures contracts for those later months may be entered into today. The home builder, thinking that interest rates several months from now are critical to his decision whether to develop a new subdivision, can get some indication of what Fed watchers, economists and mutual funds think those rates will be by looking at the interest rates implicit in Treasury bill, Treasury bond, and other interest rate futures contracts now trading. While these markets don't reveal future

spot prices with any certainty, they at least give a clue about what well-informed market participants think those future prices will be.

Pricing Futures

For details, the student is requested to consult M.Y. Khan's 'Indian Financial System' (2004), Chapter 17.

11.8 Questions

1. What is a forward contract?
2. Discuss the features of a futures contract.
3. What are the basic purposes of holding a forward and a future?
4. Mention the differences between a forward and a future contract.
5. Explain the role of arbitrageurs in the futures market.
6. How is the price discovery done in a futures market?
7. Mention various applications of forward and futures contracts.
8. Discuss the hedge mechanism through futures.

Unit 12 □ Options Contracts-Option Pricing-Option Trading Strategies

Structure

- 12.1 Introduction**
- 12.2 Call Options**
- 12.3 Put Option**
- 12.4 Relationship between Spot and Strike Price**
- 12.5 Characteristics of Option**
- 12.6 Contracts with Asymmetric Pay-off Profiles**
- 12.7 Application of Options**
 - 12.7.1 Alternatives to closing below Intrinsic Value**
 - 12.7.2 Closing Long Call Positions**
 - 12.7.3 Closing Long Put Positions**
 - 12.7.4 Should you Try to Play Market Maker ?**
- 12.8 Binomial Option Pricing Model**
- 12.9 Black-Scholes Option Pricing**
- 12.10 Standardized Option Characteristics**
- 12.11 The role of Options Clearing Corporation**
- 12.12 Portfolio Risk Management**
- 12.13 Questions**
- 12.14 References**

12.1 Introduction

Options are basically different from forward and futures contracts. An option gives the holder the right to do something, which right he need not necessarily exercise. But in a forward or futures contract the concerned parties are committed to do something. There are two basic types of options : call options and put options.

12.2 Call Options

- The period of time between the opening and closing of some future markets wherein the prices are established through an auction process.
- T An option contract giving the owner the right (but not the obligation) to buy a specified amount of an underlying security at a specified price within a specified time.
- In some exchanges the call period is an important time in which to match and execute a large number of orders before opening and closing.
- A call becomes more valuable as the price of the underlying asset (stock) appreciates.

12.3 Put Option

- An option contract giving the owner the right, but not the obligation, to sell a specified amount of an underlying security at a specified price within a specified time.
- The act of exercising a put option.
- A put becomes more valuable as the price of the underlying stock depreciates.

Terminology

Apart from the terms 'call options' and 'put options', there are several specific terms used in the context of options, which are useful for a more thorough understanding of the subject. We will use notation 'S' to represent the Spot Rate and 'X' for Strike or Exercise Price. The various terms are further explained below.

Buyer/Holder/Owner

This refers to the person who buys the option and as a result has the right to either buy/sell the underlying without the attendant obligation to do so.

Seller/Writer

The person who sells the option and as a result has only the obligation to either buy/sell the underlying, having surrendered his right to the contract for a price known as the option premium.

Option Premium

Account paid by a buyer to the seller for acquiring the right to buy or sell an underlying. Alternately, it is the price received by the seller for surrendering his right

in an option contract. It is usually paid upfront, i.e. at the time of entering into the option contract.

Strike Price

The price at which the right to buy or sell the underlying is exercisable-again agree upfornt. It is also known as the exercise/agreed price.

Expiry Date

The date on which the option contract expires or becomes invalid.

American Option

In the type option, the right (buy/sell) can be exercised by the buyer at any time during the life of the option contract.

European Option

In this type of option, the right can be exercised by the buyer only at the end of the life of the option contract.

Intrinsic Value

Given its throwaway feature (i.e., discarded if not exercised), the value of an option never can fall below zero. The intrinsic value of an option is the difference between the strike price and the spot rate of the underlying. In other words, intrinsic value represents the gain to the holder on immediate exercise of an option.

For a call option, if $S > X$ it is said to have positive intrinsic value. In the case of a put option positive intrinsic value accrues if $S < X$. for European option, the concept of intrinsic value is only notional since they cannot be prematurely exercised. On the contrary if $S < X$ for a call option and if $S > X$ for a put option, their intrinsic value is zero and not negative due to the throwaway feature.

Time Value

The difference between the total value of an option and its intrinsic value is the time value of the option. Time value represents the additional amount of premium that the option buyer is willing to pay over the intrinsic value for the unexpired life of the option.

Volatility

In risk management, risk is measured using standard deviation. Such standard deviation expressed in percentage terms is known as volatility. In options, the value/

price of the option is determined to a great extent by the volatility in the value/price of the underlying.

Break-Even Point

A break-even point is that where the costs (expenditure) and revenues (income) are equal. Hence, at break-even point, the user has a no-loss, no profit' situation.

At the money, in the money and out of the money Options (ATM, ITM and OTM Options)

All three terms are with reference to the holder of option. The word money is used to indicate profit to the holder on immediate exercise. ATM options are those which do not give any profit/loss to the holder. ITM options are those which give rise to profits and OTM options are those which result in losses at that particular point of time. The position in respect of different types of options is depicted after table 5.1.

12.4 Relationship between spot and Strike Price

| Status | Call option | Put option |
|------------------|--------------------|-------------------|
| At-the-Money | $S = X$ | $S = X$ |
| In-the-Money | $S > X$ | $S < X$ |
| Out-of-the-Money | $S < X$ | $S > X$ |

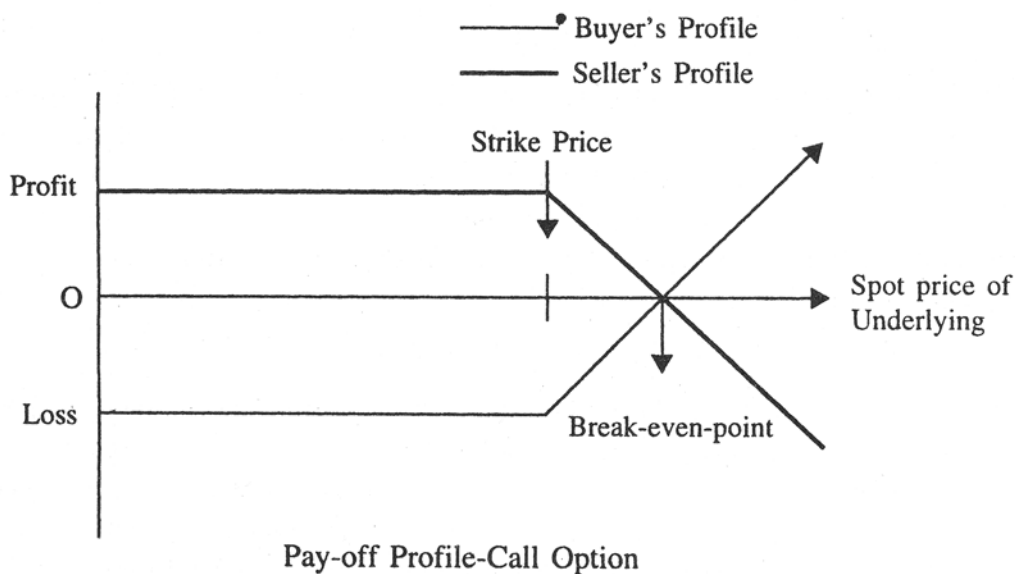
12.5 Characteristics of Option

Price Insurance Contracts

While forwards/Futures/swaps are price-fixing contracts, an option is a price insurance contract. We have seen that the major disadvantage in the case of forwards, futures and swaps is that both the buyer and seller are committed to fulfillment of the contract and as such any beneficial movement in the cash/underlying market have to be foregone by them. However, an option while insuring against the worst-cash scenario to the buyer also allows the flexibility to the buyer to take advantage of a favourable movement in the cash market.

12.6 Contracts with Asymmetric pay-off profiles

Due to the fact that a buyer purchases an insurance right to protect his loss by paying an option premium without having the obligation to exercise the same, the pay-off profile of a buyer of call option is asymmetric/ non-linear as shown in figure before. In other words, the pay-off is not linear function of the spot price of the underlying. The seller's pay-off profile would logically be a mirror-image to that of the buyers as indicated by the thicker line.



12.7 Application of Options

In order to examine the mechanics of using options, it is instructive to discuss an example using European Call options. It should be remembered that options are of two types-call/put options and American/European options.

12.7.1 Alternatives to Closing below Intrinsic Value

It may be noticed that in-the-money calls and puts can sometimes trade for less than their intrinsic amount (the difference between the stock and strike price). The problem seems much more prevalent for deep-in-the-money options as you approach expiration day. On expiration day there is very little time premium left in deep-in-the-money options and nearly their entire value is intrinsic value. While options pricing theory may say that an option should not trade for less than its intrinsic value (less any commissions), things are rarely that neat in real life.

Many investors accept this as normal and close their positions below the intrinsic value. Despite what bid and ask prices are being quoted at the time, there is a better way to determine what you should get for a deep-in-the-money option. It is based on options pricing theory as it relates to arbitrage. An option should not trade for less than intrinsic value, because if it did arbitrageurs could simultaneously trade the option and the underlying stock for a guaranteed profit. That buying and selling pressure would continue until intrinsic value is restored. So let's see how you might get a better price for your option and increase your trading profits.

12.7.2 Closing long call positions

Let's say that on the December expiration day the stock of XYZ Corp is currently trading at \$70.70 and you own 20 of December \$65 calls that you would like to close (sell). The December \$65 calls should be trading at or very near to the parity price of \$5.70. However, you see that is being quoted at \$5.20 on the bid. Closing the position by putting in a market order would mean selling at the bid price. The proceeds would be :

$$\$5.20 \times 20 \times 100 = \$10,400$$

Naturally, you can try to place a limit order to sell at \$5.70 (or more reasonably, \$5.60—a dime for the market makers to do the trade). But let's say you try that and cannot get the order executed at that price. How else can you close an in-the-money option that is trading below parity? The same way the arbitrageurs would. Instead of selling your call at the bid, place an order to sell the stock (ask). Once the sell order has been executed, immediately exercise the call option.

In the example above, the stock is currently trading at \$70.70. So place an order to sell 2,000 shares at \$70.70. Once the sell order is executed, you simply submit exercise instructions to your broker. The terms of the option contract means you will buy 2,000 shares at the strike price of \$65. So you receive \$70.70 a share on the stock sale and then buy it for \$65 on the exercise. The proceeds would be :

$$(2,000 \times \$70.70) - (2,000 \times \$65) = \$141,400 - \$130,000 = \$11,400$$

That's an additional \$1,000 in your hand!

Your broker may charge a little more to do it this way, but if the option is substantially below parity it should be well worth it. Looking at the standard commission schedule of a well-known online discount broker showed that simply selling the call options would cost \$39 vs. \$70 for the stock sale and option exercise. That means you're \$969 ahead even after commissions!

Some people (including some brokers) may suggest you short the stock instead of putting in a regular sell order. However, shorting the stock subjects you to unnecessary risk. You can short a stock only on an up tick, and there is no guarantee that will happen, So you may never even get the stock sold.

However, even if your firm requires the shares to be in your account for you to sell them, just let your broker know that you will be immediately submitting exercise instructions to purchase the shares. There is no reason they shouldn't allow it since the Options Clearing Corporation guarantees delivery of the shares at settlement.

So once you sell the stock, immediately submit exercise instructions. It is very important to submit your exercise instructions on the same day. Otherwise the sale of stock and purchase from the option exercise will not settle on the same day. While it's not really that big of a problem if you don't, I'm sure your broker would be unhappy if you made a habit of doing it.

12.7.3 Closing long Put position

What if you are instead long deep-in-the money put options? Using same example above, let's say you are long December \$80 puts and they are being quoted at a bid of \$8.70. Selling 20 of those puts to close out position, you would receive proceeds of \$17,600.

But since the stock is trading at \$70.70, those put options have an intrinsic value of $\$80 - \$70.70 = \$9.30$, a difference of \$0.60! In the case of put options trading below intrinsic value, you simply need to buy the stock and then exercise your puts.

So in this example you would pay \$70.70 to buy the stock and receive \$80 from the exercise of the put. You would then receive the full intrinsic value of \$9.30 or \$18,600—a difference \$1,000! Again, the extra commissions will be well worth it.

12.7.4 Should you try to play market maker ?

Why do options sometimes trade below their intrinsic value? It's usually because the market makers are having difficulty laying off their risk. Basically, it comes down to the law of supply and demand. There are more sellers than buyers. On (or near) expiration day, more traders may want to sell their options than want to buy them. The market maker is willing to buy, of course, but he will charge as big a premium as he can get for providing that service.

Why isn't anybody buying the Calls and selling the Stock to Restore the Equilibrium?

The answer is they are. The market makers are buying at the bid price and then selling the stock. However, there may not be enough volume or interest to bring prices into equilibrium. If they buy the option and the stock continues to fall, by the time they short the stock they may be in for a loss (even though market makers are immune to the up tick rule). So they charge a premium to cover their risk while awaiting executions.

What about Arbitrageurs or retail Investors? Why don't they join in and buy the Call and Sell the Stock?

Well, of course they can. But if they do not already have an existing position, they have to purchase (sell) the option at the ask price and sell (buy) the stock at the bid. Even with the wider spreads common with deep in-the-money options, that leaves little or no room for error.

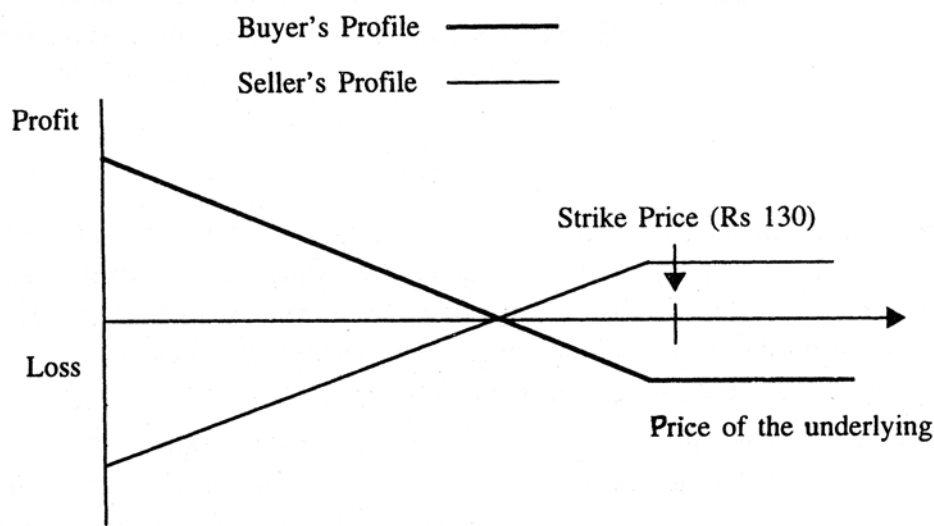
After seeing the large differences involved in the above example (which is based on a real-life situation), you may be tempted to think about trying to compete with the market makers. After all, that seems like a lot of money just sitting there to be picked up for little or no risk.

In the above example the December \$65 call option was being quoted as \$5.20 bid and \$5.90 asked. So what if you simply put in an order (for 10 or more contracts) at a slightly higher bid price, say \$5.30? Now you have the best price and the quote will move to \$5.30 on the bid and \$5.90 on the asked. If you get hit at \$5.30, you can sell the stock and make a quick profit.

But there is a catch : If you bid at \$5.30, the market maker(s) will bid \$5.40, and all you are doing is giving them a call option for 10 cents! Why is that? It is because the market maker(s) would love to buy a deep in-the-money call below the fair value. If the stock falls while your bid is open, the market maker will sell it to you at \$5.30. For very little risk, their worst outcome would be losing 10 cents. In other words, they would use your buy order as their guaranteed stop order.

There used to be an order called "exercise and cover" to use in these cases. It meant the broker would sell the stock, covering the sale by exercising the call (or buy the stock and covering by exercising the put). With the increased liquidity in the options markets, this order is no longer used, but that doesn't mean you can't do it

yourself in two separate transactions (and at considerably less cost in commissions now than in the past).



Pay-off Profile—Put Option

From the above figure it should be clear that a put option will not be exercised if the cash/market price of the underlying is greater than the strike price, since it would make better economic sense for the seller to sell the underlying in the cash market at a higher price in comparison to the option's strike price and thereby gain in the process. On the other hand, if the cash price of the underlying on the date of exercise is lesser than the break-even price (i.e. strike price-premium paid) then the put option would be exercised since the buyer of the option would gain by selling at the strike price, which is higher than that of spot/market price.

Deep in the Money

An option with an exercise price, or strike price, significantly below (for a call option) or above (for a put option) the market price of the underlying asset. Significantly, below/above is considered one strike price below/above the market price of the underlying asset. For example, if the current price of the underlying stock was \$10, a call option with a strike price of \$5 would be considered deep in the money.

The most important characteristic of this type of option is its considerable intrinsic value, which is calculated by subtracting the strike price from the underlying asset's market price for a call option (and vice versa for a put option). As an option

moves deeper into the money, the delta approaches 100% (for call options), which means for every point change in the underlying asset's price, there will be an equal and simultaneous change in the price of the option, in the same direction. Thus, investing in the option is similar to investing in the underlying asset, except the option holder will have the benefits of lower capital outlay, limited risk, leverage and greater profit potential.

Time Decay

The ratio of the change in an option price to the decrease in time to expiration is important, since options are a wasting asset, their value declines over time. As an option approaches its expiry date without being in the money, its time value declines since the probability of that option being profitable (in the money) is reduced. This is also known as "theta" and "time-value decay"

Time decay of an option begins to accelerate in the last 60 to 30 days before expiry, providing the option is not in the money (out of the money). But in the case of options that are deep in the money, time value decays more rapidly. The market finds these options too expensive compared to other strike prices or futures. As such, the holders of deep-in-the-money options nearing expiry discount the time value to attract buyers and in turn realize the intrinsic value.

The greater the certainty about an option's expiry value, the lower the time value. Conversely, the greater the uncertainty about an option's expiry value, the greater the time value.

12.8 Binomial Option Pricing Model

The binomial model takes a risk-neutral approach to valuation. It assumes that underlying security prices can only either increase or decrease with time until the option expires worthless.

A simple model used to price options that reduces possibilities of price changes, removes the possibility for arbitrage, assumes a perfectly efficient market, and shortens the duration of the option.

12.9 Black-Scholes Options Pricing

There are several approaches to pricing of options such as Binomial theory, Cox-Rubenstein, Garman and Kohlagen version for foreign currency options, etc. However, the most popular of them is the Black-Scholes model.

Assuming a world of uncertainty, the notations used would be as follows :

- S_0 = Spot price at present;
- T/t = Time of maturity of option in years;
- S_t = Spot price in time t ;
- X = Strike Price ;
- R_c = Rate of Interest of call currency;
- R_u = Rate of interest of US dollar;
- C = Option premium in terms of US\$.

For obtaining the present value, we should discount the same at US dollar interest rate, because the premium is payable in US dollar terms. The interest rate used for discounting is generally the risk less rate of return i.e., interest on sovereign bonds of comparable maturity. The mathematical identity becomes

$$C = \frac{S_t - X}{(1 + R_u)^t}$$

$$C = \frac{S_t}{(1 + R_u)^t} - \frac{X}{(1 + R_u)^t} \quad \text{Equation 1}$$

In a scenario of certainty, it follows that the future spot rate should equal the forward rate for the currency. The forward rate would be the spot rate adjusted for the interest rate differences.

$$\text{Forward rate } (S_t) = \frac{S_0 (1 + R_u)^t}{(1 + R_c)^t}$$

Substituting the above expression for S_t in Equation 1, we get :

$$C = \frac{S_0 (1 + R_u)^t}{(1 + R_c)^t (1 + R_u)^t} - \frac{X}{(1 + R_u)^t}$$

or $C = \frac{S_0}{(1 + R_c)^t} - \frac{X}{(1 + R_u)^t}$

Simplifying this

$$C = S_0 (1 + R_c)^t - X (1 + R_u)^t$$

Assuming continuous compounding, we have

$$C = S_0 e^{-R_c t} - X e^{-R_u t}$$

In the real world of uncertainty the above expression (which holds good in a scenario of perfect certainty) needs to be weighted by probability of the future rate equaling the forward rate.

The above expression become

$$C = N(d_1) S_0 e^{-R_c t} - N(d_2) e^{-R_u t}$$

This is the black-Scholes equation for pricing of an European call option, where N is the normal function.

$$d_1 = \frac{\ln(S_0 / X) + (R_c - R_u + V / 2)T}{\sqrt{VT}}$$

$$d_2 = d_1 - \sqrt{VT}$$

In = Natural logarithm function

V = Variance

A separated formula for pricing the put option was not developed by black and Scholes. Instead, they used the concept 'put-call parity' for deriving the price of a 'put option'.

| | | Right | Obligation |
|--------|--------|-------|------------|
| Option | Buyer | √ | × |
| | Seller | × | √ |

Option Buyer Vs Seller

Put-Call Parity

A fundamental arbitrage relationship called 'put-call parity' links the prices of option and future. This concept arises due to the fact that options can be combined to create a synthetic future.

This is done through using the following equation :

$$S + P = B + C$$

Where, S = the stock price

P = Put price

B = Bond price

C = Call price.

Index Options

With an Index option, the underlying asset is some market measure like the Standard & Poor's 500 stock index. While these are similar to equity options in most respects, one important difference is that they are cash-settle. One especially popular options contract, for instance, is on the S&P 100 index ticker symbol OEX. It would not be convenient to deliver 100 different stock certificates when an option holder exercises a put or a call. Instead the value of the shares changes hands rather than the shares themselves.

12.10 Standardized Option Characteristics

All options have standardized expiration dates. For most options, this is the Saturday following the third Friday of certain designated months. Individual investor typically view the third Friday of the month as the expiration date, because the exchanges are closed to public trading Saturday. Saturday is reserved for book keeping operations among the brokerage firms whose clients have dealt in the just-expiring options.

The striking price of an option is the predetermined transaction price. These are at multiples of \$2.50 or \$5, depending on the current stock price. Stock price at \$25 or below have the lower multiple while higher priced stocks have \$5 multiple. Shifts in the price of a stock result in the creation of new striking price as a matter of Options Clearing Corporation (OCC) policy, there is usually at least one striking price above and at least one below the current stock price the consequences of different striking prices will become apparent as the text progresses. Investors identify a stock option by specifying company expiration striking price and type of option (generally in this order)

Four Basic Option Positions

| | |
|---|--|
| BUY CALL Buy a hockey Ticket | BUY PUT Buy from LL Bean |
| WRITE CALL Buy Callable bond | WRITE PUT sell auto collision insurance |

Exchange-traded options have important characteristic called fungibles. This means that, for a given company, all options of the same type with the same expiration and striking price are identical. The striking price of an option is its predetermined transaction price. The striking price is also called the exercise price or just the strike price. Fungibles are particularly important to the option writer. I may write an option because the premium is attractive. If market conditions change a week later, I can buy an option on the same company with the same contract terms, and this gets me out of the market writing an option and buying a similar one are two transactions that cancel in my brokerage account.

12.11 The Role of Options Clearing Corporation

The Options Clearing Corporation (OCC) contributes substantially to the smooth operation of the options market. This organization positions itself between every buyer and seller and acts as a guarantor of all option trades. When someone buys or sells an option that person is actually buying it from or selling it to the OCC. The OCC also regulates the trading activity of members of the various options exchange setting minimum capital requirements and providing for the efficient transfer of funds among members as gains or losses occur.

12.12 Portfolio Risk Management

We also continually improve our understanding of the behaviour of security prices and the interaction of the security markets. This knowledge makes it possible and prudent for us to fine-tune our investment strategy to deal with many possible future states of the world.

Stock options are widely used in portfolio risk management. Options are much more convenient (and less expensive) to use than wholesale purchases or sales of shares of stock each time an adjustment is appropriate. This topic will be discussed in

Bid Price and Ask Price

There are actually two prices for in option at any given time : a bid price and an ask price also called the offer price. The Bid Price is the highest price anyone is willing to pay for a particular option, while the ask price is the lowest price at which anyone is willing to sell. By definition, at any moment there is only one bid price and one ask price as only one price can be the “highest” or the “lowest.”

Types of orders

When someone wants to place an options order, he or she must specify precisely what the broker is supposed to do, and specifying the type of order facilitates this. Market Orders and limit orders are two most important types.

12.13 Questions

1. Discuss the basic features of the Call and Put options.
2. How are Put strategies different from those of Calls?
3. What is Put-Call parity? Explain.
4. Describe four basic option positions, giving example for each.
5. What is the effect of time value of money on the pricing of the options?
6. Explain 'in the money' and 'out of the money'.
7. What should be the position of a short trader when the market is deep in the money'?
8. Analyse the Black-Scholes options pricing model.
9. Distinguish between options and futures/foward contracts.

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