
UNIT 5 MONEY MARKETS

Structure

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Functions and Features of Money Markets
- 5.3 Evolution of Money Market in India since the mid-eighties
- 5.4 Money Market Instruments
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5.0 OBJECTIVES

After going through this unit, you will be able to:

- discuss the main functions of the money markets;
- describe the principal features of these markets;
- list the basic money market instruments in India;
- examine the factors influencing money markets in India; and
- analyse the impact of monetary policy on money market operations.

5.1 INTRODUCTION

Debt market is generally understood as comprising the money market (short-term debt, maturity of one year or less) and the capital market (long-term debt). This distinction is made as the two sectors are driven different market forces and serve different needs of the market players. This Unit is a discussion about the nature, functioning and the developments of Money Market.

Banks and Financial Institutions, even though they plan their cash-flows meticulously, usually find that on any day their actual cash inflows and cash outflows do not match. They have either a cash short fall or cash excess. By nature these are of short-term nature. Though this happens in the case of all enterprises, it is manageable for commercial enterprises as they depend on their banks. However, banks and financial institutions that have temporary shortages cannot postpone their liabilities and have to meet these liabilities; default by them would result on a run on the banks. On the other hand banks and financial institutions which have temporary surpluses are on the look out for very short term investment opportunities. But, these should be very safe or risk-less. Any default or even a day's delay would land the banks and financial institutions in unnecessary trouble. One has to remember that these "investments" are not really investments but are by nature deployment of temporary funds in search of some return. We can say that these are parking of funds for a short time till required. Thus investments in money market are not made using the universal rule of

“trade-off between risk and return”. But, on the other hand, it is a market for funds seeking safe or riskless avenues. Money markets are different from capital markets.

Financial Markets

Capital Market

- Market for Long Term
- Supply
 - Individual savers
 - Investment by Banks
 - FI's
 - Mutual Funds
- Demand
 - Companies
 - FI's
 - Mutual Funds
- Guiding Principle
 - Risk-Return trade off

Money Market

- Market for Short Term Funds
- Assets
 - close substitutes of money
- Supply
 - Temporary surpluses of Companies, FI's Banks
- Demand
 - Temporary deficit of Companies, FI's Banks
- Guiding Principle
 - Parking in Riskless Assets
- Yield not so important

The differences between the two markets can be understood as given below:

5.2 FUNCTIONS AND FEATURES OF MONEY MARKETS

Money market can be defined as a market for money and close substitutes for money. In other words market for assets that can be converted into money easily and without any loss of capital. It can also be seen as a market for short-term funds, i.e., up to one-year maturity. The money market is generally expected to perform three broad functions.

- 1) It should provide an equilibrating mechanism to even out demand for and supply of short-term funds.
- 2) It should provide a focal point for central bank intervention for influencing liquidity and general level of interest rates in the economy.
- 3) It should provide reasonable access to providers and users of short-term funds to fulfill their borrowing and investment requirements at an efficient market clearing price.

Thus Money Market is a market for short-term funds. Money market constitutes an important segment of the financial market by providing an avenue for equilibrating the surplus funds of lenders and the requirements of borrowers for short periods ranging from overnight up to an year. In this process, it also provides a focal point for central bank's intervention in influencing the liquidity in the financial system and thereby transmitting the monetary policy impulses.

5.3 EVOLUTION OF MONEY MARKET IN INDIA SINCE THE MID-EIGHTIES

Recognizing the need for reforms in the financial system in India, The Reserve Bank of India had constituted a committee to Review the Working of the Monetary System under the Chairmanship of Shri Sukhamoy Chakravarty in 1985. While this committee gave a detailed recommendation for the reforms in the financial system, it commented

that Money Markets are a special segment and need a detailed study and recommended setting up of a special study group to go into this matter. Thus the RBI set up a Working Group on Money Market under the Chairmanship of Shri.N.Vaghul, which submitted its Report in 1987. Based on the recommendations, RBI initiated a number of measures in the 'eighties to widen and deepen the money market. The main initiatives were:

- 1) In order to impart liquidity to money market instruments and help the development of secondary market in such instruments, the Discount and Finance House of India (DFHI) was set up as a money market institution jointly by the Reserve Bank of India, public sector banks and financial institutions in 1988. RBI has since divested its shareholding and DFHI has been taken over by SBI and merged with SBI Gilts to form the SBI DFHI Ltd.
- 2) To increase the range of money market instruments, Commercial Paper, Certificates of Deposit, and Interbank Participation Certificates were introduced in 1988-89. There is a wide range of instruments now.
- 3) To enable price discovery, the interest rate ceiling on call money was freed in stages from October 1988. As a first step, operations of DFHI in the call/notice money market were freed from the interest rate ceiling in 1988 and in May 1989, the interest rate ceiling was completely withdrawn, for all operators in the call/notice money market and on interbank term money, rediscounting of commercial bills and Interbank Participation Certificates without risk. Currently, all the money market interest rates are by and large determined by market forces.

Subsequently institutions similar to the DFHI were allowed to be set up and named as many Primary Dealers PD's. As of now we have about 16 PD's in India both in the Public Sector and the Private. These PD's play a very important role in the money market, that of market makers. They participate actively in the auctions of Treasury Bills and Government Bonds. Thus they buy, stock and retail Government Debt (Primary Securities)

Check Your Progress 1

- 1) List the main functions of money markets.

- 2) Mention the significant changes taking place in the money markets of India since the mid-eighties.

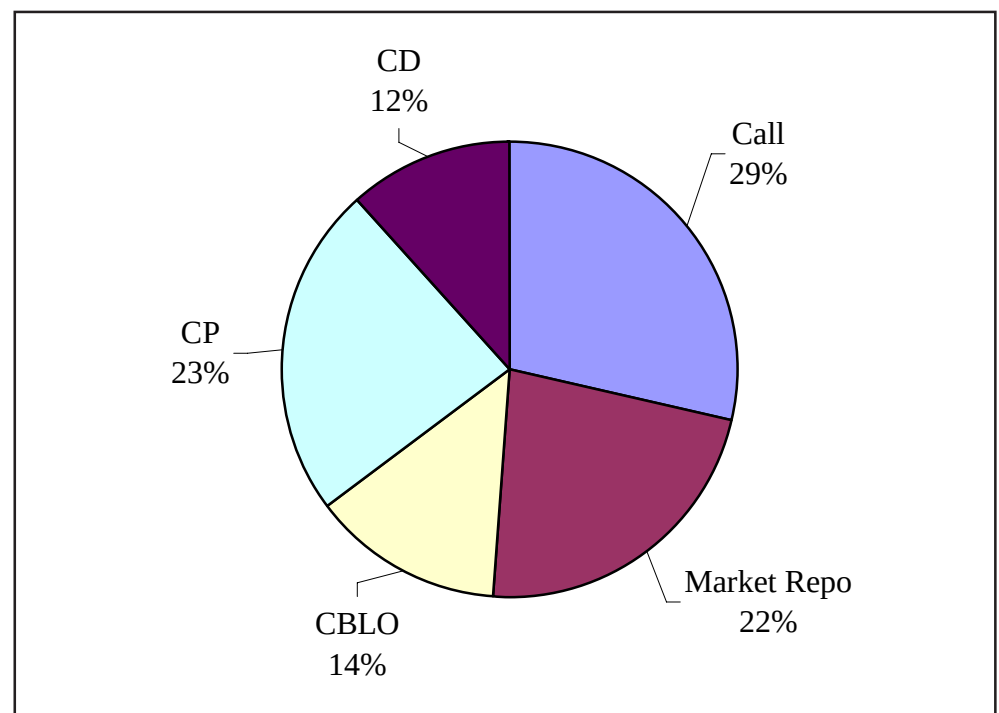
5.4 MONEY MARKET INSTRUMENTS

As discussed earlier, the institutions having temporary surpluses seek risk-less investments. Thus special type of instruments are needed in this market. These instruments are called Money Market Instruments. They are discussed below.

Characteristics of Money Market Transactions

- Short Term in Nature
- Instruments with very low risk are used
- Very low transaction costs
- No transactions hassles
- Very high volumes
- Thus the market efficiency depends on
 - Low cost transactions
 - Information availability, and
 - Large number of participants

The figure below shows the proportion of various instruments in the total money market as prevailing in India



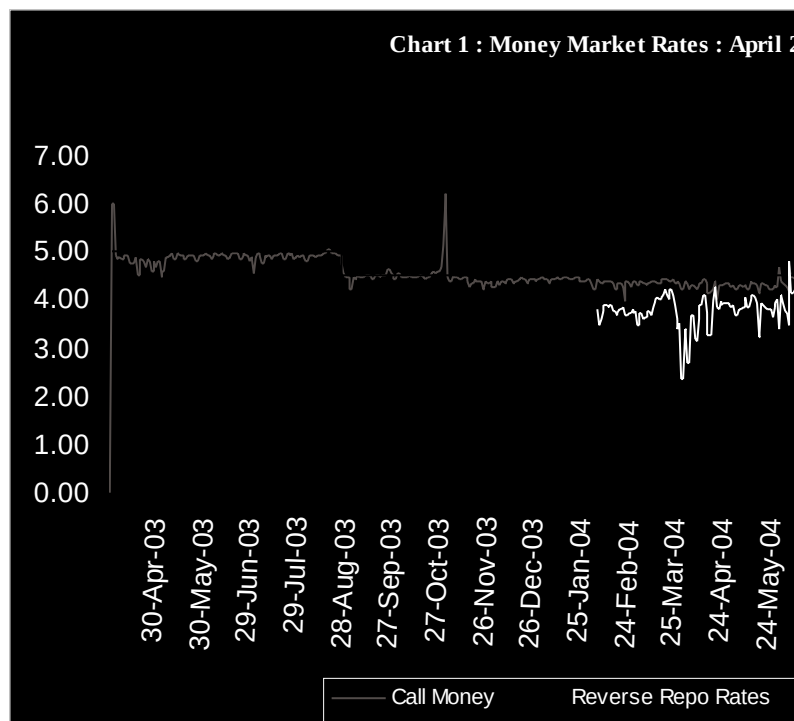
Call Money

Call Money is the over night inter-bank funds market in India. It has the following characteristics:

- Overnight funds / deposits
- Participants

- Banks
- Primary Dealers
- FI (restricted)
- Demand And Supply
 - Temporary surpluses / deficits of banks and PD's
- RBI restrictions
 - Totally deregulated and left to market forces. But,
 - Only for Banks and Primary Dealers
- Clean Lending, in the form of a deposit
- Interest rates
 - Deregulated i.e., rates determined by the market forces
- Volatile : wide fluctuations even during the day

The figure below shows the change in the rates for various money market instruments in India in the period 2003-2005.



- Intervention of RBI through LAF, OMO
- High value transactions
- Brokers not allowed

The call/notice money market was predominantly an interbank market until 1990, except for UTI and LIC, which were allowed to operate as lenders since 1971. The RBI's policy relating to entry into the call/notice money market was gradually liberalised to widen and provide more liquidity. The behaviour among banks in the call money market is not uniform. There are some banks, mainly foreign banks and new private sector banks, which are active borrowers and some public sector banks

that are major lenders. RBI has been a major player in the call/notice money market and has been moderating liquidity and volatility in the market through repos and refinance operations and changes in the procedures for maintenance of cash reserve ratio.

A reference rate in the overnight call money market called “MIBOR” or the “Mumbai Interbank Offer Rate” similar to the LIBOR has emerged recently through the National Stock Exchange and Reuters.

Commercial Paper

CP is a money market instrument, issued in the form of a promissory note, by highly rated corporates for a fixed maturity in a discounted form. CP was introduced in India in 1989 to enable highly rated corporate borrowers to diversify their sources of short-term borrowing and also to provide an additional instrument to investors. Terms and conditions for issuing CP like eligibility, modes of issue, maturity periods, denominations and issuance procedure, etc., are stipulated by the Reserve Bank. There are no interest rate restrictions on CP. With experience, refinements were made to the instrument by removing/easing number of restrictions on the maturity and size of CP, requirement of minimum current ratio, restoration of working capital finance, etc. Corporates, PDs and SDs are eligible for issuing CP for a minimum period of maturity of 15 days and maximum period of 1 year. It is significant to note that there is no lock-in period for CP. The issuance of CP has been generally observed to be related inversely to the money market rates.

Certificates of Deposit

While deposits kept with banks are not ordinarily tradable, when such deposits are mobilised by a bank by issue of a CD, then such deposits get securitised and, therefore, become tradable. Thus, CDs represent essentially securitised and tradable term deposits.

In India, CDs were first introduced in 1989. The terms and conditions for issuing CDs like eligibility, maturity periods, size, transferability, applicability of reserve requirements, etc., are stipulated by the Reserve Bank. CDs in general represent relatively a high cost liability. Hence, banks resort to this source generally when the deposit growth is sluggish but credit demand is high.

Treasury Bills

Treasury Bills are instruments of short-term borrowing of the government and play a vital role in cash management of the government. Their characteristics are as follows:

- Short Term Debt of Government of India
- Maturity less than a year
- Issued
 - through RBI
 - at a discount to face-value and redeemed at F V
 - for 91, 182 and 364 days maturity
 - by weekly / fortnightly auction
 - competitive and non-competitive bids
- Anybody can invest

- Minimum investment Rs 25,000
- Good secondary market
- Good instrument for cash management
- Eligible for Reverse Repo transactions with the RBI

Being risk-free, their yields at varied maturities serve as short-term benchmarks and help pricing varied floating rate products in the market. Treasury Bills market has been the most preferred by central banks for market interventions to influence liquidity and short-term interest rates, generally combined with repos/reverse repos. Hence, development of this market is very crucial for effective open market operations. The auction procedures have been streamlined to have notified amounts for all auctions and to accept non-competitive bids outside the notified amounts.

Repurchase Agreements (Repos)/Ready Forward Transactions

Repo refers to a transaction in which a participant acquires immediately funds by selling securities and simultaneously agreeing for repurchase of the same or similar securities after specified time at a given price. The following are its characteristics:

- Repurchase agreement/RP's Buy-Backs/Ready Forward
- Combination of a Ready Transaction and a Forward Deal
- Simultaneous sale of an asset (today)

And an agreement (contract)

To repurchase the same asset on a future date at a price fixed today

- Two legs
 - Sale
 - Give the asset and receive rupees
 - Title passes on 'day one'
 - Re-purchase
 - Give rupees and receive back the asset
 - Title restored on the date of maturity

The transaction combines, elements of both a securities purchase/sale operation and also a money market borrowing/lending operation. Typically it signifies lending on a collateralised basis. The terms of contract is in terms of a "repo rate" representing the money market borrowing/lending rate. As in the case of other instruments, repos also help equilibrating between demand and supply of short-term funds. Internationally, repurchase agreement (Repo) is a versatile and perhaps the most popular money market instrument.

In our market, two types of repos are currently in operation - interbank repos and the RBI repos. Interbank repos are permitted under regulated conditions. RBI repos are used for absorption/injection of liquidity.

Now all Government securities have been made eligible for repo. Further, besides banks, Primary Dealers are allowed to undertake both repo/reverse repo transactions. Non-bank participants have also been allowed recently to lend money through reverse repos to other eligible participants. In terms of instruments, the repos have also been permitted in PSU bonds and private corporate debt securities

provided they are held in dematerialised form in a depository and the transactions are done in recognised stock exchanges. RBI has removed the restriction of a minimum period of 3 days for inter bank repo transactions. This enables banks and other participants in the repo market to adjust their liquidity in a more flexible manner.

RBI has been using its repo instrument effectively for absorbing excess liquidity and for infusing funds to ease the liquidity. The repo rate set by the Bank has also more recently become a sort of signaling rate along with Bank Rate. The repo rate currently in a way serves the purpose of a ceiling and the Reverse Repo Rate as the floor for the money market to operate within an interest rate corridor.

Collateralized Borrowing and Lending Obligation(CBLOs)

CBLOs are a mechanism to borrow and lend funds against securities through a platform provided by the Clearing Corporation of India Ltd (CCIL), for the lenders and borrowers to come together not only for banks but also for primary dealers, financial institutions, mutual funds, non-banking finance companies and corporates. It is a type of derivative debt instrument which has short maturities, up to 90 days. This overcomes the drawbacks plaguing the present Repos market - obligations can be squared up only on the due date – cannot “pre-pay or “call-back”. The holder of CBLO can sell, or, an investor can buy it, at anytime during its tenure. The CBLO's are in denominations of Rs 50 lakh and are traded through ‘offers’ and ‘bids’, specifying the discount rate and maturity period. The bids/offers will be through an auction screen called ‘auction market’. These orders are matched on the basis of the best quotations, allowing, of course, for negotiations. The net liabilities and receivables for each participant are settled at the end of the day are settled. CCIL fixes borrowing limits for each participant on the basis of a valuation of the securities after a ‘hair-cut’. This instrument has emerged as a very useful cash management instrument for both banks and the corporate firms.

Money Market Mutual Funds

Money Market Mutual Funds (MMMFs) were introduced in India in April 1991 to provide an additional short-term avenue to investors and to bring money market instruments within the reach of individuals. A Task Force was constituted to examine the broad framework outlined in April 1991 as also the implications of the Scheme. Based on the recommendations of Task Force constituted for the purpose, detailed scheme of MMMFs was announced by the Reserve Bank in April 1992.

The portfolio of MMMFs consists of short-term money market instruments. Investment in such funds provide an opportunity to investors to obtain a yield close to short-term money market rates coupled with adequate liquidity. The growth in MMMFs has, however, been less than expected.

Check Your Progress 2

- 1) Explain Call money as a money market instrument.

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- 2) Distinguish between Repurchase agreements and collateralised borrowing and lending operations.

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5.5 FACTORS INFLUENCING MONEY MARKETS IN INDIA

There are many factors influencing and affecting money markets. RBI is the most important influencing factor in India money market. By virtue of the implication for the conduct of monetary policy, money market comes within the direct purview of RBI regulation. The primary aim of the Reserve Bank of India's operations in the money market is to ensure that the liquidity and short-term interest rates are maintained at levels consistent with the monetary policy objectives of maintaining price stability, ensuring adequate flow of credit to productive sectors of the economy and bringing about orderly conditions in the foreign exchange market. The Reserve Bank of India influences liquidity and interest rates as follows:

- RBI and the Money Market RBI intervention and signaling through the money market
- RBI Repo
 - sells GOI bonds from own holding and repurchase them
 - Implications
 - Borrows from the market
 - Sucks up liquidity
 - Influences interest rates- “ floor”
- RBI Reverse repo
 - Buys GOI bonds into own holding and sells them back
 - Implications
 - Lends to banks/PD's
 - Injects liquidity
 - Influences interest rates – “ceiling”

Liquidity Adjustment Facility

The Narasimham Committee has observed that the RBI support to the market should be through a Liquidity Adjustment Facility (LAF) under which the RBI would periodically, if necessary, daily, reset its repo and reverse repo rates which would in a sense provide a reasonable corridor for market play. It now operates as follows in conjunction with the Open Market Operation (OMO) :

- LAF
 - every day
 - Both REPO and Reverse Repo window
 - Pre-announced Reverse Repo and Repo Rates
 - “Auction” for the amount borrowed or injected
 - Very effective fine tuning of money supply/liquidity/interest rates
- OMO sale or purchase of RBI on “own account”
 - Influences the money supply/liquidity
 - Longer-term effect than LAF

Thus the thrust of LAF is the continuous presence of the Reserve Bank in the money market through the operation of repos window. While reverse-repos are used for absorbing excess liquidity at a given rate (floor) and infusing liquidity into the system through repos at a given rate (cap), the floor and cap rates set by the repo window provide an effective corridor for the operation of the call money market. Depending upon the stance of the policy to ease or tighten the liquidity, floor and cap rates could be adjusted from time to time. While on the floor side of the market, the Reserve Bank’s repo window has been by and large effectively operating, supply of liquidity at a cap rate has to take into account several considerations.

5.6 MONEY MARKET AND MONETARY POLICY IN INDIA

The linkages between the money market and monetary policy in India are very important.

A central bank seeks to influence monetary conditions through management of liquidity by operating in varied instruments. In an administered or controlled regime of money and financial markets, the management of liquidity is essentially through direct instruments, like varying cash reserve requirements, limits on refinance, administered interest rates and quantitative and qualitative restrictions on credit. Thus, the cost, availability, and direction of funds flow come under the direct influence of the central bank. In a deregulated and liberalized market environment, the position is different, since the interest rates are largely determined by market forces. In that situation, there is still a need to influence monetary conditions through management of liquidity, but, this has to be achieved mainly through market based operating instruments, like open market operations and refinance/discount/repo windows. The central bank becomes, in a way, a part of the market, though it is still above the market, by virtue of its power to influence primary liquidity. The success of market based indirect instruments, of course, depends upon the existence of a vibrant, liquid and efficient money market, well integrated with the other segments of financial market, in particular the government securities and foreign exchange markets. Such an integrated and efficient market is necessary, for monetary policy impulses, sent through money market interventions to be reflected in the monetary conditions, through the transmission channel of the general level of interest rates. In a later unit of the course, in Block 4, you will have occasion to study monetary policy in greater detail.

Check Your Progress 3

- 1) What are the main factors influencing money markets. Answer with special reference to India.

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- 2) Bring out the linkages between monetary policy and money markets.

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5.7 LET US SUM UP

This unit has familiarised you with the market for short-run funds. The unit aimed at discussing the market for short-term funds with a particular orientation regarding India. The unit began by distinguishing between capital markets and money markets and then went on to describe the main features and the functions of the money market.

The unit subsequently went on to take an orientation that focussed on the situation with regard to money markets in India. The unit described the growth and evolution of the money markets in India since the mid-1980s. It described in great detail several of the money markets in operation in India. Next, the unit looked at the factors that affect money market operations. It mentioned that the Reserve bank of India's policy is the main influence on the money market. Finally the unit touched upon monetary policy and its impact on the money market.

5.8 KEY WORDS

Commercial Paper	: A short-term unsecured promissory note, issued by corporations, mostly on discount basis
Financial Intermediation	: The process of facilitating the flow of funds from surplus spending units to deficit spending units
Liquidity	: The extent to which or the ease with which an asset may quickly be converted into cash with the least administrative and other cost

Repurchase Agreement : An agreement between buyer and seller in the sale of securities to reverse the transaction in the future at a specified date and price

5.9 SOME USEFUL BOOKS

Bhole, L.M, (2004). *Financial Institutions and Markets*, Tata McGrawHill, New Delhi.

Fama, E.F. (1972) *Foundations of Finance*, Basic Books, New York.

Khan, M.Y. (2003), *Indian Financial System* Tata McGraw, New Delhi.

Pathak, Bharati V. (2003), *Indian Financial System*, Pearson, New Delhi.

5.10 ANSWERS /HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Read section 5.2 and answer.
- 2) Read section 5.3 and answer.

Check Your Progress 2

- 1) Read section 5.4 and answer.
- 2) Read section 5.4 and answer.

Check Your Progress 3

- 1) Read section 5.5 and answer.
- 2) Read section 5.6 and answer.

UNIT 6 CAPITAL AND EQUITY MARKETS

Structure

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Purpose and Users of Capital Markets
- 6.3 Debt and Equity as Means of Raising Finance
- 6.4 Debt Market Instruments and their Pricing
- 6.5 Equity: Markets and Volatility
- 6.6 Indices of Share Prices
- 6.7 Let Us Sum Up
- 6.8 Key Words
- 6.9 Some Useful Books
- 6.10 Answers/Hints to Check Your Progress Exercises

6.0 OBJECTIVES

This unit discusses capital markets, and markets for equities. After going through this unit, you should be able to:

- describe the purposes for which capital markets exist and the role they play in a modern economy;
- list the various participants and the types of exchanges taking place in these markets;
- compare between debt and equity as means of raising finance for business firms;
- analyse the working of debt markets, the instruments in these markets and the pricing in these markets;
- discuss the principles of the working of equity markets; and
- explain the concept of share price indices and the methods of their construction.

6.1 INTRODUCTION

In Unit 3 of the previous block, you were introduced to asset pricing. In that unit, you were familiarized with the concepts of assets, and how their prices are determined. You learnt about the concepts of risk-free and risky assets, and how investors choose an optimal portfolio of assets. This unit gives a more descriptive, but sufficiently analytical, discussion of how capital markets and debt markets function, who the participants in these markets are, and how trading and exchanges take place in these markets.

In the present block, the previous unit acquainted you with markets for short-term funds, and we learnt these markets are called money markets. The present unit deals in detail with various markets for long-term funds. These are called capital markets. We will see there are primarily two types of capital markets: debt markets, and equity markets. In the next section, we consider the purpose of capital markets

in general, and the various participants in these markets. In the section after that, we will look at debt and equity as alternative means of raising finance. Section 6.4 limits itself to the debt market but provides a detailed discussion about the workings of these markets. The subsequent section turns to equity markets and explains why there is volatility, or risk, in these markets. Finally section 6.6 discusses the indices of share prices and how these are constructed. Let us begin our study of these markets.

6.2 PURPOSE AND USERS OF CAPITAL MARKETS

We have seen that investment is nothing but postponed consumption. So there are investors who are willing to lock in their funds in the expectation of earning higher returns, making capital gains. On the other side, there are business firms, organisations, and individuals who need funds and finance for making physical investments in the hope of making profits or gains, or even for consumption. Capital markets constitute a mechanism for bringing together buyers and sellers of various types of financial assets. Exchanges of these financial assets determine their prices.

The financial system of a nation consists of financial institutions, financial markets, and financial instruments and services. A financial market is an arrangement that facilitates the exchange of financial assets, including deposits and loans, corporate stocks and bonds, government bonds, and derivatives like futures and options. You will read about derivatives in the next unit. Financial markets can be classified in several ways: as primary and secondary markets, that is markets in new issues and markets in existing issues; as organised or formal markets, and unorganised or informal markets; and financial markets can also be classified as money markets, or markets for short-term funds, and capital markets, or markets for long run funds.

Capital markets can be markets where long-term debt contracts are traded, like bond markets or debentures, or these can be equity markets where financial claims are sold which allows the holder a share in the profits of the firms issuing these shares. The markets where shares are issued initially are called primary markets, and the markets where the holders of these shares further trade these in the expectations of making capital gains are called secondary markets.

Let us look now at the basis for the need and provision of finance, as this will enable us to know about debt as the foundation of finance, and see who the participants in the markets are. Capital markets are all about the raising of capital and matching those who want capital (borrowers) with those who have capital (lenders). One way of matching these are financial institutions like banks and other depository institutions. For more complex transactions, markets are needed in which borrowers (and their agents) can meet lenders (and their agents). Commitments to borrow and lend are created. There are also markets where these commitments to borrow and lend are themselves sold off to other people. For example, companies can raise money by selling shares to investors and existing shares can be freely bought and sold.

Who are the borrowers? Individuals can borrow for domestic purchases or for longer term such as financing and mortgages of houses, or consumer durables, or education... companies need short-term funds to finance their cash flow. They need longer term funds for growth and expansion. Governments are huge borrowers.

They often borrow by issuing securities like bonds. Their total borrowing is called National Debt. Public sector companies may also borrow for expansion and growth. Borrowing may also be done from foreign agencies, institutions etc. Similarly, lenders may be individuals, or financial institutions, or even companies. A company can use some of its idle funds to lend for short periods in order to make gains, in the money market.

When money is lent, in many cases the borrower issues a receipt for the money, a promise to pay back. These receipts are called securities, and the lender has claims on these securities. Thus securities are financial claims. The holders of financial securities are the lenders, and the issuers of financial securities are the borrowers. There are many types of securities like Treasury Bills, Certificates of Deposits, Commercial Paper, bonds, debentures, equity shares, and so on. All securities show key information about how much is owed, when it will be paid back, and how much is the rate of interest.

So we have seen that markets exist for finance and the main participants are borrowers, lenders, their agents and other individuals and agencies that facilitate exchanges. Borrowers issue securities. Lenders purchase these securities. For example when the government issues a bond, we say that the government is selling the bonds. When you purchase the bond, you are actually lending money to the government, and the government is borrowing money from you. The market for long-term securities is called capital market.

Capital markets perform several important functions in a market economy. The capital markets makes information processing and dissemination easier, which allows better decisions can be taken regarding investment, selling of assets, and so on. Capital markets allow quick valuation of financial instruments – both debt and equity. Capital markets also enable operational efficiency by simplifying transactions procedure and lowering search costs and transactions costs. Capital markets help to develop integration among several sectors of the economy such as between real and financial sector, between debt and equity instruments, between short-term and long-term funds, and between domestic and external funds. Finally, capital markets facilitate the flow of funds into efficient channels through proper investment.

6.3 DEBT AND EQUITY AS MEANS OF RAISING FINANCE

In this section we will take a look at one particular borrower: the business firm. We shall see how firms take decisions about raising finance for their short-term and long-term requirements. Firms can raise finance either by borrowing (debt) or by issuing shares. So when we are talking of shares, we have only the primary market in mind. We are looking from a firm's point of view and asking how much of the finance should be raised by incurring debt, and how much should be raised through issue of shares. Is there some theory or some principles that will help the firm to make a decision? This is what we discuss now.

A firm has several assets that it invests in, and these investments generate a stream of cash flows. If the firm is entirely equity financed, these cash flows belong only to the shareholders. On the other hand, the firm can offer shares but also go in for borrowings. This will offer the lenders some risk-free investment opportunity. How much of the capital the firm should raise through debt and how much through equity is a decision that is important for the firm. This is called the capital structure of the

firm. To understand the decision regarding capital structure of the firm, we will first look at some indicators of the firm's financial position, particularly some financial ratios. One can look at the balance sheet and the income statements. Balance sheets look at the situation with assets and liabilities at a particular point of time while the income statement is a view of the earnings and expenditure that takes place over a specified period of time, usually a year. We can also look at a firm's generation of cash. But what we propose to do now is to look at some important financial ratios regarding a firm's financial activity and performances. Ratio analysis forms a powerful tool in assessing the financial condition of the firm and enables us to relate disparate financial data with each other. Ratio analysis of this sort will enable us to understand the capital structure of the business firm.

Different people and groups have varying stakes in the firm and they will have different concerns over a firm's performance. Stockholders and bondholders will be concerned about the long-term profitability of the firm, while creditors will look to see whether the firm is able to meet its payments on time. The management of the firm is concerned with both the long run and short run as well as day-to-day performance. There are several types of ratios that we shall be considering now. All of these can be grouped into four types: **liquidity ratios**, which measure the ability and adequacy of the current assets to meet current liabilities as they come due; **activity ratios**, which give an indication of the efficiency with which the firm uses its resources; **financial leverage ratios**, which measure how effective the firm is in managing its debt; and finally, **profitability ratios**, which measure how effective the firm is in generating net revenues and income in relation to sales, costs, assets and shareholder equity.

Let us begin with liquidity ratios. Liquidity ratios refer to a firm's ability to meet its short-term obligations and are concerned with the size and composition of the firm's working capital position. A higher working capital position implies more liquidity. An important ratio is the **current ratio**, which equals current assets divided by current liabilities. This ratio indicates the amount of current assets available to meet all its obligations under current liabilities. The current ratio includes inventories, but since inventories are among the least liquid of a company's assets, it is sometimes useful to exclude them. Deducting inventories from the current ratio gives us the **quick** or **acid-test ratio**:

$$\text{Quick ratio} = (\text{Current assets} - \text{Inventories}) / \text{Current Liabilities}$$

Next we turn to some activity ratios. These by and large have to do with sales generated, often in relation to the amount invested in them. One such measure is the **accounts receivable turnover**, which equals net credit sales divided by turnover. A related measure is the average collection period, which is given by $(365)(\text{receivables}) / (\text{net credit sales})$. We can look at the total asset turnover which is an overarching activity ratio and is defined as:

$$\text{Total asset turnover} = \text{Net sales} / \text{total assets}$$

Now let us focus on some financial leverage ratios, which will enable us to talk about the capital structure of firms. Sometimes, as in Britain, leverage is called 'gearing'. Leverage ratios reflect a firm's risk position by analysing its financing mix.. the idea is that more the operations of the firm is financed through debt, the greater the risk. Information on this can be obtained from the firm's balance sheet. The other way is to use income statement data to derive the coverage ratios, which measure the company's ability to service that debt. Two widely used ratios derived from the information in balance sheets are the debt ratio and the debt-equity ratio.

By debt, here we mean the firm's current liabilities as well as long run debt. The **debt ratio** is defined as:

Debt ratio = Total Liabilities divided by Total Assets

The **debt-equity ratio** is defined as:

Debt-equity ratio = Total Liabilities divided by Equities

Now since total assets equal total liabilities plus equity, it can be shown (it is left to you as an exercise) that:

Debt-equity ratio = Debt ratio divided by (1 – Debt Ratio)

From the income statements we can derive the firm's cash flow coverage, which is given as: **Cash Flow Coverage**

$$= \frac{[\text{EBIT} + \text{Lease/rental Payments} + \text{Depreciation}]}{\text{Interest} + \text{Lease/Rental Payment} + \text{Principal Repayment} / (1-T)}$$

Where EBIT stands for annual earnings before interest and taxes, and T stands for taxes on a firm.

Finally we discuss profitability ratios. These ratios allow the shareholders to evaluate management's performance. There are two types of profitability ratios used: profit margin on sales, and returns on assets employed. Profit margins- type of profitability ratios look at a firm's expenditure in relation to sales. There are two important such ratios: gross profit margin and net profit margin. They are defined as follows:

Gross Profit Margin = gross Profits/Net Sales

Net Profit Margin = Net Income/Net Sales

In addition, we can work out the **operating profit margin which is defined as:**

Operating profit margin = EBIT/Net Sales.

In addition to looking at ratios related to the profit margin, we can relate returns to assets and shareholders equity. Two ratios frequently used are **(ROA)**, also known as **return on investment (ROI)**, and **return on equity (ROE)**. They are defined as:

Return on Assets = Net Income/Total Assets

Return on Equity = Net Income/Shareholders' Equity

Equipped with these ratios, we now discuss, somewhat briefly, some elements of capital structure of a firm. The central question is: can the firm create value by carefully selecting its debt-equity mix? There are two lines of thought on this: the first one says that capital structure is irrelevant, because the value of the firm is determined by the yield on the company's real assets and working on the *claims* on these assets does not change their total value. The other line of thinking says that in the real world, there are taxes and other distortions, and hence an optimal degree of debt-equity ratio, that is, leverage, and hence firms can raise their debt to equity ratio up to a point.

What happens when the leverage of a firm goes up? We have seen that financial leverage refers to the substitution of fixed-charge financing-mainly debt (interest and principal) but also preferred stock for common stock. If the firm finances entirely

through equity, fluctuations in earnings per share arise entirely through the firm's business risk. If some of this equity is substituted by debt, a smaller group of people is holding the remaining shares. So the risk to them increases because a smaller group of people is holding on to the existing business risk. This added risk is called financial risk. Financial leverage also affects the expected level of earnings per share (EPS) and return on equity (ROE). We state some of the basic results regarding the consequences of leverage:

- 1) When the return on assets exceeds the interest cost of debt, financial leverage raises both EPS and ROE and reduces them when the return on assets is less than the cost of debt.
- 2) Financial leverage raises the variability or volatility of both EPS and ROE. This is because the creditor claims are of a fixed nature. A fixed amount must be paid to creditors regardless of the financial situation of the firm.
- 3) Financial leverage generally raises the *expected* value of EPS as well as that of ROE. Therefore, leverage is likely to raise both EPS and ROE, but increases their variability. So the firm cannot focus on the expected EPS and ROE alone; it has to take variability into consideration as well.

We now turn to alternative theories of the capital structure of a firm. We just saw that leverage can have both positive and negative effects. Is there then an optimal level of leverage? The traditional thinking on this was that since leverage substitutes debt for equity, what happens is that as the proportion of debt increases, the proportion of cheaper credit increases while that of more expensive equity decreases, and hence, the firm's weighted average cost of capital (average of debt and equity) declines. This means that the total value of the firm goes up.

This traditional view was challenged in a remarkable article by Franco Modigliani and Merton Miller in 1958 published in the *American Economic Review*. They demonstrated that if we assume that there are no taxes, transactions cost and other market distortions, then *the capital structure does not matter*. This paper set the stage for financial discipline to acquire a rigorous theoretical edge and no longer be informed by accountancy practices and anecdotal evidence, but be based on mathematical economics and empirical studies. Modigliani-Miller's first proposition is that the value of the firm is independent of its capital structure. Their second proposition is that the cost of equity capital for a leveraged firm is equal to the constant overall cost of capital plus a risk premium. This risk premium itself is equal to the difference between the overall cost of capital and cost of debt multiplied by the debt-equity ratio. Symbolically, it can be shown as:

$$K_e = K_o + (K_o - K_d) \frac{D}{E}$$

where K_e is cost of equity capital

K_d is cost of debt capital

K_o is the overall cost of capital, that is, the weighted average cost of capital.

Their first proposition is based on an arbitrage kind of argument. It suggests that in equilibrium identical assets must sell for identical prices, regardless of how they are financed. This arbitrage type of assumption, together with the assumption that

the firm’s operating cash flow is independent of its capital structure, gives rise to the first proposition.

Check Your Progress 1

1) What are the main functions performed by capital markets in the economy?

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2) Name and define two liquidity ratios and two financial leverage ratios.

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3) State the Modigliani-Miller theorem.

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6.4 DEBT MARKET INSTRUMENTS AND THEIR PRICING

The main debt instruments are bonds, which are fixed-income securities. The investor (who is the lender) gets periodic interest payments over the life of the bond and the principal payment at the time of redemption of the bond. The issuer of the bond (who is the lender, that is who undertakes to bear the debt) promises to pay the holder (buyer) of the bond this periodic stream of payments and the principal at the end. Debentures are like bonds, except that there is a clause that enables the investor to convert the debenture into equity shares on certain pre-specified terms and conditions.

There are short-term debt instruments, about which you studied in detail in the previous unit on money markets, like treasury bills, certificates of deposits, commercial paper etc. In this unit we limit ourselves to a study of bonds. Bonds are issued by governments and these are government-guaranteed. For example, in India, the Government of India is the largest borrower. The government sells short-term to medium-term bonds issued by the Reserve Bank of India. State governments also sell bonds. Apart from the central and state governments, a number of government agencies issue bonds that are guaranteed by the government. Other than government

bonds, there are bonds issued by public sector companies, financial institutions, and private sector companies.

Over the last couple of decades, there have been several innovations in the types of bonds that have been issued. Traditionally simple bonds have been issued (these are known as ‘plain vanilla bonds’ or straight bonds). These bonds usually pay a fixed periodic coupon over its life and return the principal on the maturity date. The new types of bonds are of several types: zero coupon bonds; floating rate bonds; bonds with embedded options; and commodity-linked bonds. These are explained below.

Zero coupon bonds do not give regular interest payments. It is issued at a large discount and redeemed at face value on maturity. Sometimes, these bonds carry call and put options. You will know about put and call options in the next unit. Floating rate bonds, unlike straight bonds that pay a fixed rate of interest, pay an interest rate that is linked to a benchmark rate such as the interest rate on Treasury bills. Bonds with embedded options include bonds like debentures that give the bond holder the right to convert them into equity shares; as well as callable bonds, which are bonds that give the issuer the right to redeem them prematurely on certain terms; and bonds with put options, which are bonds that give the investor the right to prematurely sell them back to the issuer on certain terms. Finally there are commodity-linked bonds that are bonds the return from which depend on the price of certain specified commodities.

We will be looking at the risks associated with bonds in detail in Unit 15 of Block 4. For the present, we proceed from the assumption that bonds are risk free. With that assumption, let us now discuss the value of a bond and see how the value of a bond is determined. The value of a bond is equal to the present value of the expected cash flows arising from it. Here you will do well to go over Unit 4 in Block 1. Hence we need to look at the expected stream of cash flows and an estimate of the returns. We assume further that the bond pays a fixed coupon interest rate, that coupon payments are made annually and that the bonds will be redeemed at par when it matures.

With these assumptions, the cash flow for such a bond is:

$$A = \sum_{t=1}^T \frac{X}{(1+r)^t} + \frac{M}{(1+r)^T}$$

where A = value (in rupees)

T = number of years

X = annual coupon payment (in rupees)

The required return is denoted by r

M = maturity value

The time period when the payment is received is denoted by t.

A basic property of a bond is that there is an inverse relationship between the price of the bond and yield. This is because as the yield increases, the present value of the cash flow decreases; therefore the price falls. What is the relationship between the bond price and time? Since the bond price must equal its par value at maturity (we assume there is no risk of default) bond prices change with time. If the current price prevailing when the redeemed is higher than the par value of the bond, the bond is said to be a premium bond; if the current price at the time of redemption is lower, the bond is said to be a discount bond.

The trading of bonds is usually based on their prices. But since there are significant differences in cash flow patterns, and also other features, of different bonds, different bonds are not usually compared in terms of their prices. Instead, the point of comparison is bond yields. We now turn to some measures of bond yields. A common measure of yield is the **current yield**, which relates the annual coupon interest to the market price. It is expressed as:

Current Yield = Annual Interest / Price.

The current yield does not consider the capital gain (or loss) that the investor will face if she holds the bond till maturity and sell at a premium (or discount). This measure also neglects the time value of money. The next measure of yield that we consider is the **yield to maturity**. This is that value of the rate of interest that makes the present value of the cash stream received from owning the bond equal to the price of the bond. It can be expressed as

$$P = \sum_{t=1}^T \frac{X}{(1+r)^t} + \frac{M}{(1+r)^T}$$

Where P is the price of the bond, and the other letters denote the same variable as in the previous equation. Sometimes the calculation of r in the above is difficult and a trial-and-error procedure is resorted to. The final measure of yield that we consider is the **yield to call**. It is calculated in the same way as yield to maturity, except that in yield to call, instead of maturity value at the end, there is call price and the duration, instead of going from say, 1 to T, goes from 1 to the number of years until the assumed call date.

Check Your Progress 2

- 1) Distinguish among straight bonds, zero-coupon bonds, and floating rate bonds.

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- 2) Depict and explain the cash flow of a bond that has a fixed coupon rate and gives an annual stream of returns.

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- 3) What is the relation between the yield of a bond and its return? Explain the concept of current yield and yield to maturity.

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6.5 EQUITY: MARKETS AND VOLATILITY

We will discuss markets and trading mechanisms and exchanges obtaining in India in much richer detail in Unit 12. For now, we give a largely general theoretical analysis of the stock market and its functioning, as also its role in the economy.

Before we go on to discuss equity markets, let us discuss the role that equity markets play in the economy. We shall use the term stock market and stock exchange interchangeably. What does a stock exchange do? It provides the regulation of company listings, a price formation mechanism, the supervision of trading, authorisation of members, settlement of transactions and publication of trade data and prices.

Equity markets consist of primary markets and secondary markets. The primary market is the market for new issues of shares, where shares are initially offered to the public. The secondary market, on the other hand, is the market for already-issued financial assets. The main difference between the two markets is that in the secondary market the issuer of the share does not receive funds from the buyer. Rather, the existing issue changes hands in the secondary market, and funds flow from the new buyer of the share to the original buyer.

Equity capital is ownership capital. It is the shareholders who collectively own the company. They undertake the risks, but also earn the rewards of ownership. The amount of capital that a company *can* issue is the **authorised capital**. The amount of capital that a company actually offers to investors is the **issued capital**. The part of capital subscribed by investors is called the **paid-up capital**. The par value is the face value of the share. When the issue price is greater than the par value, the difference is called the **equity premium**. The **book value** of an equity share is equal to:

$(\text{paid-up capital} + \text{reserves and surplus}) / (\text{number of equity shares outstanding})$.
The **market value** of an equity share is the price at which it is traded in the market.

We now turn to some valuation ratios. Valuation ratios indicate how investors assess the stock in the equity markets. These are thus indicators the performance of the issuing firm. The important valuation ratios are: the price-earnings ratio, the yield, and the ratio of market value to book value.

Price-earnings ratio: it is defined as the market price per share divided by earnings per share. The earnings per share ratio is just the after-tax profit less preference dividend divided by the number of outstanding equity shares.

The price-earnings ratio reflects risk characteristics, investor sentiments, the degree of liquidity, and growth prospects.

Yield: this measures the rate of return earned by shareholders. It is defined as:

$\text{Yield} = (\text{Dividend} + \text{price change}) / \text{Initial price}$. We can break this into two parts:
 $\{\text{Dividend} / \text{Initial price}\} + \{\text{price change} / \text{Initial price}\}$

The first term denotes the dividend yield, while the second term is the capital gains or losses yield. Usually companies with low growth prospects offer a high dividend yield while the capital gains yield is low. It is the converse with regard to companies with high growth prospects.

Market Value to Book Value ratio: this is defined as the ratio of market value per share to the book value per share. It is a measure of the firm's generation of wealth. If it is more than 1, that is, if the market value exceeds the book value, it

means wealth has been generated. We can see that if the ratio of market value to book value is equal to one, all the three ratios, namely, earnings price ratio (reciprocal of price-earning ratio), yield and return to equity will be equal to each other.

Nobel laureate James Tobin has proposed a valuation ratio, called Tobin's q, after the letter he used to denote it. The q ratio is defined as:

$$(\text{Market value of equities and liabilities})/(\text{estimated replacement cost of assets})$$

The q ratio looks a little like the market value to book value ratio. But there are two important differences: the numerator of the q ratio includes liabilities of the issuer of debt instruments along with market value of equities, that is, it includes all wealth. Also, in the denominator of the q ratio, the assets are valued at their replacement cost, not book value.

The main functions of the secondary markets are that it provides useful information both to the issuer as well as investors the function it serves for the issuer is as follows. The secondary market provides regular information, by the latest prices of shares, to the original issuer of the shares about the value of its shares. The periodic trading of the asset reveals to the issuer the price the share commands in the market at a certain time. Such information helps the issuer to evaluate how well they are using the funds from earlier primary market activities, and it also provides some idea about how receptive investors will be to new issues.

To the original buyer of shares in the initial public offering in the primary market, the secondary market acts like an escape clause. If the shares do not seem to be doing as well as the original buyer thought, he or she can always sell it for cash. Of course, the investor can also sell it for cash with a view to making capital gains. The secondary market provides the original buyer of the shares an opportunity to sell these for cash. In fact, if the investors are not confident that they can move from one financial asset to another, they might be reluctant to invest in any security. This will make it difficult for the issuers to issue new shares, and moreover, they will have to offer higher returns or dividends to attract investors.

The secondary markets also perform a useful function in that they provide information about the assets' fair price, as well as liquidity from their assets should they want to sell the assets. Another very important function performed by secondary stock markets is that they reduce search costs, by making it easier for buyers and sellers of assets to find each other. The secondary markets also lower transactions cost.

Let us now discuss some basic parameters that enables one to gauge the functioning of the stock market as a whole, which makes it easier to know if the stock market is developed and mature or not. The parameters that we should look at in order to judge the functioning of equity markets are: volatility, liquidity, size of the market, and transactions cost. **Volatility** of a stock is a measure of the frequency with which its price changes over a period of time. If the price changes frequently, it means that the stock is volatile. Investors tend to avoid shares with high volatility because of the risks involved. Volatility of stocks also influences the outside flow of funds, and hence has a macroeconomic dimension. Proximate factors like speculation and trading and settlement systems, as well as other factors like government policies, interest rates, inflation, and the regulatory framework for equity markets all affect volatility in the stock market.

Liquidity is a very important indicator of the proper functioning of stock markets. The situation with regard to liquidity greatly influences stock market efficiency and

development. A market is considered liquid when large volumes of trade can take place without significant effect on stock prices. If an investor is able to transact at a price close to the current market price, the market is considered very liquid. There are two methods for measuring liquidity: the turnover ratio and the value traded ratio. The **turnover ratio** equals the ratio of the total value of domestic shares traded to total market capitalisation. This ratio seeks to measure the trading of domestic equities in domestic markets relative to the size of the market. The more the volume of sale, the higher is the turnover. High turnover is often an indicator of low transactions costs. Even if a market is large, turnover may be low in spite of huge market capitalisation if the volume of trading is low, which can occur if the market is not very active. The other measure of liquidity is the **value-traded ratio**. This equals the ratio of the total value of domestic shares traded on the major stock exchanges to the GDP. It is a reflection of organised trading of shares as a proportion of GDP and is thus a macro-level indicator of liquidity in the capital markets.

The third parameter regarding the functioning of equity markets is the size of the stock market, and a useful measure of this size is the **market capitalisation ratio**, which is the ratio of market capitalisation (the value of listed shares) to the GDP. It is economically very significant as it is based on the assumption that the size of the stock market is positively correlated with the ability to mobilise capital and diversify risk. Hence it is expected that in an economy with well-developed stock markets, the market capitalisation ratio will be large. This ratio complements the value-traded ratio. The final indicator of the development, maturity and vibrancy of stock markets is the level of transactions costs. In the context of stock markets transactions cost would include explicit costs like brokerage costs, stamp duty, commission etc, as well as implicit costs like clearing and settlement costs, bad delivery, paperwork and so on. If transactions costs are low, investors will be induced to trade in greater volume, which in turn will raise the value traded ratio.

6.6 INDICES OF SHARE PRICES

The stock market index is a very important indicator of the performances of share prices. It takes a set of stocks as representative of the prices of shares in the market, and by tracking the changes in this index, we can get an idea of the overall market sentiment. The stock market index is a pointer to market behaviour. The stock market index reflects market direction and indicates day-to-day fluctuations in stock prices.

What are the characteristics of a good index of share prices? A good index should have two characteristics. First, it should consider a set or group of scrips that have high market capitalisation, secondly, these scrips should also be highly liquid. Market capitalisation, as we have seen, refers to the sum of the market value of all the stocks included in the index. The market value is obtained by multiplying the price of the shares with the number of shares outstanding. Liquidity refers to the ease with which a share can be bought or sold at a price close to the current market price.

Basically, the share price index is calculated for a particular day as a percentage of the aggregate market value on that day of the set of stocks included in the index to the average market value of the same shares during the base period. For example, the BSE Sensex (Sensitive Index) is a weighted average of the prices of 30 select stocks. Suppose the index is the set of prices of the largest 25 companies, it means that these companies are largest in terms of market capitalisation. Sometimes the index is weighted. If the index is based on the price of, say 35 companies, a weighted

index implies that a 1% change in the price of the largest companies in the group constituting the index will have more impact on the index than a 1% change in the price of the smallest. Since share prices are changing frequently, the companies with the top shares do not remain the same and hence the constituents of the index can change.

We must be careful to make a distinction between price averages and price indices. In 1884, for example, Charles Dow, publisher of the *World Street Journal* started publishing share price *averages*. The Dow Jones average started with the average of twelve shares. Since 1928, the number of shares whose price average is calculated has been thirty. The main index in Japan, the Nikkei Dow 225, an index of 225 shares is based on average prices, not market capitalisation. Usually the average is arithmetic mean, but sometimes geometric mean is calculated. For example, the *Financial Times* Ordinary Share Index that began in 1935, calculated the geometric mean of the prices of 30 shares. Modern indices are based on taking the number of shares and multiplying by the price. This gives accurate weight to the companies with the largest market capitalisation.

The majority of the stock market indices used in practice falls in two categories:

(i) equal weighted index and (ii) value-weighted index. The former is an index that reflects the simple arithmetic average of the sample shares at a certain time (year or month or day) with reference to the base period. The latter reflects the aggregate market capitalisation of the sample shares in a certain time with reference to the base time period. Thus what we had earlier referred to as price average can also be viewed as equal weighted index and what we had referred simply to price index can be called value-weighted index.

Some analysts make a fine distinction even within the market capitalisation weighted method and the non-capitalisation weighted method. In this classification, market capitalisation weighted method can be sub-classified into three types: full market capitalisation method; free float market capitalisation method and modified capitalisation method. In the first, the number of shares outstanding multiplied by the market price of a company's share determines the scrip's weight in the index. The shares with higher market capitalisation would have greater weightage in this kind of index, and will exercise greater influence on the overall index. In India, as has been mentioned earlier, the BSE Sensex follows this method. So does the Nifty. The free-float method does not consider a set constructed from among all shares in the market but from a smaller sub-set of shares. It considers only those shares that are freely available for buying in the market and excludes strategic investments in a company and shares locked-in under employee stock-ownership plans. The free-float method recognises that investible market capitalisation may be lower than the total capitalisation. In this method, closely held companies would have a much lower weightage. The free-floating methodology is quite popular across the world. The third method under the market capitalisation method is the modified capitalisation method. This method recognises that if a simple market capitalisation method is followed, the largest stocks with huge market capitalisation would have a disproportionate weightage and would dominate the entire index. Hence, the modified capitalisation method seeks to limit the influence of the largest stocks in the index.

The two other methods for calculating stock price indices are the price weighted index and equal weighting method. In the former, the price of each stock in the index is summed up which is then related to a base value. In the equal weighting method, each stock's percentage weight in the index is equal.

Let us now mention about some of the major indices of share prices in India and abroad. In India there are two main indices: the Bombay Stock Exchange (BSE) Sensitive index (Sensex) and the National Stock Exchange (NSE) Nifty. The BSE Sensex was launched in 1986. It comprises 30 shares and uses 1978-79 as the base year. It uses large market capitalisation. Today only about 11 of the original 30 remain in the basket. In 1997, it was revised and 15 of the original shares were removed. In their place, the shares of banks and institutions having a weight of 14.6 per cent were included. Now scrips of IT companies have a huge weightage. Infosys has the largest market capitalisation among such companies, at 16.85 per cent. Companies, which may be otherwise large and very valuable, but the trading volume of whose shares are low, are not included in the index. Wipro is a prime example of such a company.

The other major share price index in India is the Nifty of the National Stock Exchange. The National Stock Exchange was started in 1994 and in a very quick time its volume exceeded that of BSE. With collaboration with the Credit Rating Information Services of India Limited (CRISIL) and Standard & Poor, the S&P CNX Nifty was launched on July 8, 1996, comprising 50 scrips, which are selected on the basis of low impact cost, high liquidity and market capitalisation. Both BSE and NSE use a weighted average method of weighting, where the weights are in proportion to its market capitalisation.

Other than these two major indices, some other indices are the Economic Times Ordinary Share Price Index, Financial Express Ordinary Price Index, and the RBI Index of Security Prices. Regional stock exchanges such as those in Ahmedabad, Chennai, Delhi and Kolkata have their own indices.

We now state some major indices abroad. A very prominent index is the Dow Jones Industrial Average, which is for the New York Stock Exchange, the National Association of Securities Dealers Automatic Quotation (NASDAQ), the Nikkei in Japan, the Standard & Poor etc.

Check Your Progress 3

- 1) What is the difference between issue capital and paid-up capital? What do you understand by equity premium?

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- 2) What are the functions performed by the secondary stock markets?

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- 3) What is a stock market index? Distinguish between an equal weighted index and value-weighted index.

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6.7 LET US SUM UP

This unit dealt with financial markets for long-term funds. It discussed both debt and equity markets. We started by learning about the various participants in the capital market. We also came to know the important functions that capital markets perform. They perform important roles in providing information, enabling matching of sellers and buyers, and lowering search costs and transactions costs. The unit then went on to look at the comparative methods of raising finance through debt and through equity. We studied this choice in the context of a representative business firm. This choice, which in general term is called a firm's capital structure, is part of the firm's financial management. We studied the famous Modigliani-Miller theorem in this regard.

We next turned to a discussion of debt markets and equity markets and took up their discussion one at a time, separately. We started with the debt markets and looked at the instruments traded in that market, and discussed some theories regarding their pricing. We next studied equity markets, distinguishing between primary and secondary markets. We learnt about the way the issues are offered in the primary markets and we also looked at the functioning of secondary markets and learnt about their functions and uses. We studied in some detail the way to know if stock markets are advanced and mature in an economic system, or are they merely fledgling and poorly developed. We then learnt a bit about the volatility that characterises equity markets and how these are tackled. Finally the unit discussed indices of share prices. We looked at the requirements of a good stock price index, and came to know the various types of indices in use. The unit finally mentioned some of the important indices in India and abroad.

6.8 KEY WORDS

Coupon	: The periodic interest paid on a bond. It equals the face value of the bond multiplied by the coupon rate of interest
Coupon Rate	: Annual coupon amount divided by the face value of the bond
Equity Premium	
Leverage Market Capitalisation	: The ability of a firm to service its debt
Working Capital	: Current assets minus current liabilities
Par Value	: Specified principal sum a bondholder is scheduled to receive when the bond matures

6.9 SOME USEFUL BOOKS

Bhole, L.M. (2004), *Financial Institutions and Markets*, 4th edition, Tata McGraw-Hill, New Delhi.

Dothan, U. (1990), *Prices in Financial Markets*, Oxford University Press, New York

Fabozzi, F., Modigliani, F., and Jones, F. (2002) *Capital Markets, Institutions and Instruments 3rd edition*, Prentice-Hall, New Jersey.

6.10 ANSWERS/ HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Read section 6.2 and answer.
- 2) Read section 6.3 and answer
- 3) Read section 6.3 and answer.

Check Your Progress 2

- 1) Read section 6.4 and answer.
- 2) Read section 6.4 and answer.
- 3) Read section 6.4 and answer.

Check Your Progress 3

- 1) Read section 6.5 and answer.
- 2) Read section 6.5 and answer.
- 3) Read section 6.6 and answer.

UNIT 7 DERIVATIVES MARKETS

Structure

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Derivative: Basic Concepts
- 7.3 Types of Derivatives
 - 7.3.1 Forward Contract
 - 7.3.2 Futures
 - 7.3.3 Options
 - 7.3.4 Swaps
- 7.4 Models of Derivative Pricing
 - 7.4.1 Binomial Option Pricing Model
 - 7.4.2 The Black Scholes Formula
- 7.5 A Brief History of Derivatives in India
- 7.6 Let Us Sum Up
- 7.7 Key Words
- 7.8 Some Useful Books
- 7.9 Answers/Hints to Check Your Progress Exercises

7.0 OBJECTIVES

After going through this unit, you will be able to:

- explain the concept of a derivative;
- describe the various types of derivatives;
- discuss various models of derivative pricing; and
- describe the evolution of Derivatives in India.

7.1 INTRODUCTION

Derivative products like futures and options on Indian stock markets have become important instruments of price discovery, portfolio diversification and risk hedging in recent times. The volumes in derivative markets, especially in the case of National Stock Exchange (NSE), have shown a tremendous increase and presently the turnover in derivative markets is much higher than the turnover in spot markets. At the NSE, the total turnover in the cash segment was Rs.6, 95,049 crore during April-September 2005. The turnover in the NSE's derivative segment continued to be higher than in the cash segment. It increased by 59.2 per cent to Rs.17, 55,790 crore during April-September 2005 (Chart 53). Hence, it becomes increasingly important to know its intricacies.

7.2 DERIVATIVE: BASIC CONCEPTS

The term “Derivative” indicates that it has no independent value, i.e., its value is entirely “derived” from the value of the underlying asset. The underlying asset can be

securities, commodities, bullion, currency, live stock or anything else. In other words, Derivative means a forward, future, option or any other hybrid contract of pre determined fixed duration, linked for the purpose of contract fulfillment to the value of a specified real or financial asset or to an index of securities. Derivatives are also known as “deferred delivery of deferred payment instruments”. In a sense, they are similar to securitised assets, but unlike the later they are not the obligations, which are backed by the original issuer of the underlying assets or security.

With Securities Laws (Second Amendment) Act, 1999, Derivatives has been included in the definition of Securities. The term Derivative has been defined in Securities Contracts (Regulations) Act, as:

A Derivative includes:

- a) *a security derived from a debt instrument, share, loan, whether secured or unsecured, risk instrument or contract for differences or any other form of security;*
- b) *a contract which derives its value from the prices, or index of prices, of underlying securities.*

Eg. A stock option is a derivative whose value is dependent on a price of a stock. However, derivative can be dependent on almost every variable from price of hogs to the amount of snow falling at a certain ski resort.

The derivative contract also has a fixed expiry period mostly in the range of 3 to 12 months, from the date of commencement of the contract. The value of the contract depends on the expiry period and also on the price of the underlying asset.

For example, a farmer fears that the price of wheat (underlying), when his crop is ready for delivery will be lower than his cost of production. Let's say the cost of production is Rs 8,000 per ton. In order to overcome this uncertainty in the selling price of his crop, he enters into a contract (derivative) with a merchant, who agrees to buy the crop at a certain price (exercise price), when the crop is ready in three months time (expiry period). In this case, say the merchant agrees to buy the crop at Rs 9,000 per ton. Now, the value of this derivative contract will increase as the price of wheat decreases and vice-a-versa. If the selling price of wheat goes down to Rs 7,000 per ton, the derivative contract will be more valuable for the farmer, and if the price of wheat goes down to Rs 6,000, the contract becomes even more valuable. This is because the farmer can sell the wheat he has produced at Rs .9000 per tonne even though the market price is much less. Thus, the value of the derivative is dependent on the value of the underlying.

If the underlying asset of the derivative contract is coffee, wheat, pepper, cotton, gold, silver, precious stone or for that matter even weather, then the derivative is known as a commodity derivative.

If the underlying is a financial asset like debt instruments, currency, share price index, equity shares, etc, the derivative is known as a financial derivative.

Derivative contracts can be standardized and traded on the stock exchange. Such derivatives are called exchange-traded derivatives. Or they can be customized as per the needs of the user by negotiating with the other party involved. Such derivatives are called over-the-counter (OTC) derivatives.

From the example above: if he thinks that the total production from his land will be around 150 quintals, he can either go to a food merchant and enter into a derivatives

contract to sell 150 quintals of soybean in three months time at Rs 9,000 per ton. Or the farmer can go to a commodities exchange, like the National Commodity and Derivatives Exchange Limited, and buy a standard contract on wheat. The standard contract on wheat has a size of 100 quintals. So the farmer will be left with 50 quintals of wheat uncovered for price fluctuations.

However, exchange traded derivatives have some advantages like low transaction costs and no risk of default by the other party, which may exceed the cost associated with leaving a part of the production uncovered.

Economic Functions of Derivatives Market

- 1) They help in transferring risks from risk averse people to risk oriented people.
- 2) They help in the discovery of future as well as current prices.
- 3) They catalyze entrepreneurial activity.
- 4) They increase the volume traded in markets because of participation of risk averse people in greater numbers.
- 5) They increase savings and investment in the long run.

Check Your Progress 1

- 1) Explain the concept of a derivative.

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- 2) List the various functions of derivative markets.

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7.3 TYPES OF DERIVATIVES

In the financial markets, various derivatives are traded. To start with we need to understand the following three:

- 1) Forward
- 2) Futures
- 3) Options
- 4) Swaps

7.3.1 Forward Contract

Forward Contracts (forwards) have flourished for many centuries in many countries including India. It is the simplest of all derivatives. A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price.

It is a one to one bipartite contract, which is to be performed in the future at the terms decided today. One of the parties in the forward contract assumes a *long position* and agrees to buy the underlying asset on a certain specified future date for a certain specified period. The other party assumes a *short position* and agrees to sell the asset on the same date at the same price. Let us understand the concept with the help of an illustration.

Two parties enter into a contract to buy and sell 100 shares of Reliance at Rs 850 per share, two months down the line from the date of the contract. Assume A is the buyer and B is the seller. In the instant case, the product (shares of Reliance), quantity of product (100 shares), product's price (Rs. 850 per share), and time of delivery (2 months from the date of the contract) have been determined and well understood, in advance by both the parties concerned. The delivery and payment (settlement of the trade) will take place as per the terms of the contract on the designated date and place.

But there could be risk of default here, suppose the Reliance's price two months down the line goes up substantially, seller B would prefer to sell the share the markets rather than selling these shares to A as contracted; because, market would fetch him better price. Therefore he may default. Similarly, in case, price of Reliance goes down, buyer may choose to default because he may find he would find it attractive to buy Reliance share from the market at lower price, instead of honoring the contract. This way, both A and B are exposed to each other's risk of default.

Forwards markets are used in India on a large scale in foreign exchange market to hedge the currency risk. Forward contracts being negotiated by the parties on one to one basis, offer them tremendous flexibility to articulate the contract in terms of price, quantity, quality, delivery time & place. But because they are customized they are plagued with poor liquidity and default risk (credit risk) as explained in the example above.

Calculation of Payoffs from Forward Contracts

This example will help us understand it better, two parties might agree today to exchange 500,000 barrels of crude oil for US \$ 42.08 a barrel three months from today.

A forward contract is specified with four variables:

- 1) the underlier,
- 2) the notional amount n ,
- 3) the delivery price k , and
- 4) the settlement date on which the underlier and payment will be exchanged.

In our example, oil is the underlier. The notional amount is 500,000 barrels. The delivery price is US \$ 42 per barrel. The settlement date is the actual date three months from now when the oil will be delivered in exchange for a total payment of US \$ 21.04 MM.

The party who receives the underlier is said to be long the forward. The other party is short. At settlement, the forward has a market value given by

$$n(s - k) \quad [1]$$

where s is the spot price of the underlier at settlement. This formula derives from the fact that, at settlement, the long party is paying a delivery price k for an underlier

then trading at price s . The difference between those two prices, multiplied by the notional amount, is the market value of the forward.

Formula [1] tells us that forwards have linear payoffs.

A forward may be cash settled, in which case the underlier and payment never exchange hands. Instead, the contract settles with a single payment for the market value of the forward at settlement, as given by [1]. If the market value is positive, the short party pays the long party. If it is negative, the long party pays the short party.

Suppose the forward in our oil example were cash-settled. On the settlement date three months from today, no oil would change hands, and there would be no payment of US \$ 21.04MM. If the spot price at settlement were, say, US \$ 47.36, then the forward would settle with a single payment of

$$500,000(47.36 - 42.08) = \text{US } \$ 2.64\text{MM} \quad [2]$$

made by the short party to the long party.

Forward are generally quoted as delivery prices, which are called forward prices. Forward prices fluctuate with market conditions. When a forward is entered into, the contract's delivery price is set equal to the quoted forward price. That delivery price then remains fixed until the forward settles. For example, a dealer might quote a three-month oil forward at 41.25/41.29. Those are the bid and offer forward prices. If a counterparty accepts the offer price for 500,000 barrels, then the delivery price on that contract will be USD 41.29.

Issues such as the time value of money, short-term supply and demand, market expectations of future spot prices and cash-and-carry arbitrage tend to make forward prices diverge from spot prices, but relevant factors vary from one market to the next. A graph of forward prices for different maturities is called a forward curve.

7.3.2 Futures

Futures contract means a legally binding agreement to buy or sell the underlying security on a future date. Future contracts are the organized/standardized contracts in terms of quantity, quality (in case of commodities), delivery time and place for settlement on any date in future. The contract expires on a pre-specified date which is called the expiry date of the contract. On expiry, futures can be settled by delivery of the underlying asset or cash. Cash settlement enables the settlement of obligations arising out of the future/option contract in cash.

Unlike forward contracts, futures are normally traded on an exchange. These markets being organized/standardized, are very liquid by their own nature. Therefore, the liquidity problem, which persists in the forward market, does not exist in the future market. In future markets, clearing corporation /house becomes the counter party to all the trades or provides the unconditional guarantee for their settlement i.e. assumes the financial integrity of the entire system. In futures markets, clearing corporation/house maintains the accounts of all the operations in the market. So it is in a position to tell in the last trading day of the contract, who two are the counter parties to each other and provides the solution to the settlement problem, which is very acute in the forward market.

The following example will help to understand the concept in a better way. Referring to the earlier example of A & B entered into a contract to buy and sell Reliance shares. Now, assume that this contract is taking place through the exchange, traded

on the exchange and clearing corporation/ house provides the unconditional guarantee for its settlement, it would be called a future contract.

The fundamental difference between futures and forwards is the fact that futures are traded on exchanges. Forwards trade over the counter. This has three practical implications:

- 1) Futures are standardized instruments. You can only trade the specific contracts supported by the exchange. Forwards are entirely flexible. Because they are privately negotiated between parties, they can be for any conceivable underlier and for any settlement date. Parties to the contract decide on the notional amount and whether physical or cash settlement will be used. If the underlier is for a physically settled commodity or energy, parties agree on issues such as delivery point and quality.
- 2) Forwards entail both market risk and credit risk. A counterparty may fail to perform on a forward. With futures, there is only market risk. This is because exchanges employ a system whereby counterparties exchange daily payments of profits or losses on the days they occur. Through these margin payments, a futures contract's market value is effectively reset to zero at the end of each trading day. This all but eliminates credit risk.
- 3) The daily cash flows associated with margining can skew futures prices, causing them to diverge from corresponding forward prices.

In view of the above we can say that when standardized and traded on the exchange forward contract becomes futures contract. Therefore all futures contracts are standardized forward contracts. Forward and futures do the same but futures do it better and more efficiently because of transparency and robust risk management in this case. The futures contracts may be settled through physical delivery of asset/ assets or only in cash. Settlement features of futures contracts are well defined in the contract specifications by the exchanges.

A future is transacted through brokerage firms that hold a "seat" on the exchange that trades that particular contract. Working through their respective brokers, two parties will transact a trade. *Legally*, that trade is structured as two trades both with a clearinghouse owned by or closely affiliated with the exchange. For example, suppose Party A and Party B trades five May natural gas futures at US\$ 3.24. Party A is long and Party B is short. This would be legally structured as Party A being long five May natural gas futures at US\$ 3.24 with the exchange's clearinghouse being the counterparty; and The exchange's clearinghouse being long five May natural gas futures at US\$ 3.24 with Party B being the counterparty. Party A and B then have no legal obligation to each other. Their respective legal obligations are to the exchange's clearinghouse. The clearinghouse never takes market risk because it always has offsetting positions with different counterparties.

Two parties negotiate (through their respective brokers) a futures transaction. They agree on the price and the number of contracts. Legally, the transaction is structured as two contracts, each between one of the parties and the exchange's clearinghouse. In this way, the parties are not exposed to each other's credit risk. There is credit risk between the respective parties and the clearinghouse, but that is all but eliminated through a margining process. Because the clearinghouse always takes offsetting positions, it never takes market risk.

Before you can trade a futures contract, the broker collects a deposit from you called initial margin. This may be in the form of cash or acceptable securities. The

broker holds this deposit for you in a margin account and, in the case of a cash deposit, credits interest on the balance. The amount of initial margin is determined according to a formula set by the exchange. For a single futures contract, it will be a small fraction of the *market value* of the futures' underlier. For *futures spreads*, or if you are using futures to hedge a physical position in the underlier, initial margin may be even lower. Generally, initial margin is intended to represent the maximum one-day net loss you could reasonably be expected to incur on a position.

Every day, the profit or loss is calculated on your futures position. If there is a loss, your broker transfers that amount from your margin account to the clearinghouse. If there is a profit, the clearinghouse transfers that amount to your broker who then deposits it into your margin account. This is the daily margining process. The clearinghouse's margin cash flows net to zero. For every margin payment it receives from one party, it makes an offsetting margin payment to another party.

Through the margining process, futures settle every day. Unlike a forward, where all contract obligations are satisfied at maturity, obligations under the futures contract are satisfied every day on an ongoing basis as mark-to-market profits or losses are realized. This essentially eliminates credit risk for futures.

Futures can be of many types viz., Index Futures, Stock Futures etc. Futures contract of this type are based on an index. For example, futures contract on NIFTY Index and BSE-30 Index. **An index future** is, as the name suggests, a future on the index i.e., the underlying is the index itself. There is no underlying security or a stock, which is to be delivered to fulfill the obligations, as index futures are cash settled. As other derivatives, the contract derives its value from the underlying index. The underlying indices in this case will be the various eligible indices and as permitted by the Regulator from time to time. **A stock futures** contract is a standardized contract to buy or sell a specific stock at a future date at an agreed price. A stock future is, as the name suggests, a future on a stock i.e., the underlying is a stock. The contract derives its value from the underlying stock. Single stock futures are cash settled.

7.3.3 Options

Options Contract is a type of Derivatives Contract which gives the buyer/holder of the contract the right (but not the obligation) to buy/sell the underlying asset at a predetermined price within or at end of a specified period. The buyer/holder of the option purchases the right from the seller/writer for a consideration which is called the premium. The seller/writer of an option is obligated to settle the option as per the terms of the contract when the buyer/holder exercises his right. The underlying asset could include securities, an index of prices of securities etc.

Under Securities Contracts (Regulations) Act, 1956 options on securities has been defined as "option in securities" means a contract for the purchase or sale of a right to buy or sell, or a right to buy and sell, securities in future, and includes *a teji*, *a mandi*, *a teji mandi*, *a galli*, a put, a call or a put and call in securities;

An Option to buy is called *Call option* and option to sell is called *Put option*. Puts and calls are sometimes called **vanilla options** to distinguish them from more exotic structures. Further, if an option that is exercisable on or before the expiry date is called *American option* and one that is exercisable only on expiry date, is called *European option*. The price at which the option is to be exercised is called *Strike price* or *Exercise price*. Not that whereas it costs nothing to enter into a forward or futures contract, there is a cost to acquiring an option.

As an example, consider a three-month, European exercise, strike US \$ 45 put option on 100,000 barrels of Brent oil. Such an option might trade OTC. It has:

underlier: Brent oil

Notional amount: 100,000 barrels

Expiration: in three months

Strike price: US \$ 45

It gives the holder the right, but not the obligation, to sell the issuer 100,000 barrels of Brent oil three months from today for a price of US \$ 45 per barrel.

Another Example is, assume Mr. A goes to the market likes the television worth Rs. 12,000. A doesn't have the money to make the full payment at that time and he offers Rs. 2,000 to the shopkeeper with a proposal to take the delivery within two days after paying the balance amount. Further assume that the shopkeeper makes it clear that the television is not brought within two days, contract would expire. This is typical example of a forward contract wherein shopkeeper not being confident about the counter party has taken the advance, which may be treated as margin money in the instant case. It is clear that if Mr A doesn't turn up in 2 days he would be losing his advance paid. This would be a default situation. Another way to structure this deal is that Mr A tell the shopkeeper that you pay Rs. 200 – 300 for reserving the television for me. If I want I will come back and pay Rs. 12,000 and buy the television. Otherwise, I will lose the right to buy the same. In the case A is a option buyer and the shopkeeper is the option seller. An option buyer has a right to buy the option but not the obligation. If he comes across another shop selling the same television from the second shop but for a lesser price than he will forget the deal with the first shop and buy the television and buy it from the second shop. In other words A would let his right expire if he finds it unattractive to exercise the option. If A doesn't exercise his right, he is not going to receive back Rs. 200 – 300, paid for reserving the television for 2 days This money may be called the price of the option.

In the case of American options the buyer has the right to exercise the option at anytime on or before the expiry date. This request for exercise is submitted to the Exchange, which randomly assigns the exercise request to the sellers of the options, who are obligated to settle the terms of the contract within a specified time frame.

As in the case of futures contracts, option contracts can be also be settled by delivery of the underlying asset or cash. However, unlike futures cash settlement in option contract entails paying/receiving the difference between the strike price/exercise price and the price of the underlying asset either at the time of expiry of the contract or at the time of exercise/assignment of the option contract.

The options contracts, which are based on some index, are known as Index options contract. However, unlike Index Futures, the buyer of Index Option Contracts has only the right but not the obligation to buy/sell the underlying index on expiry. Index Option Contracts are generally European Style options i.e., they can be exercised/assigned only on the expiry date. The investment strategies with index options are similar to that of an individual stock options. Investors expecting a market rise buy calls, and those expecting a market decline buy puts. Index options offer benefit of lower cost (premium cost & transaction costs) and greater efficiency than a package

of options on a multitude of individual stocks and debt securities because of diversifying effects of operating with a sort of portfolio which an index represents.

In the beginning futures and options were permitted only on S&P Nifty and BSE Sensex. Subsequently, sectoral indices were also permitted for derivatives trading subject to fulfilling the eligibility criteria. Derivative contracts may be permitted on an index if 80% of the index constituents are individually eligible for derivatives trading. However, no single ineligible stock in the index shall have a weightage of more than 5% in the index. The index is required to fulfill the eligibility criteria even after derivatives trading on the index has begun. If the index does not fulfill the criteria for 3 consecutive months, then derivative contracts on such index would be discontinued.

By its very nature, index cannot be delivered on maturity of the Index futures or Index option contracts therefore, these contracts are essentially cash settled on Expiry.

In options markets, the exercise (strike or striking) price means the price at which the option holder can buy or sell the underlying asset. If the current price of the underlying asset exceeds the exercise price of a call option, the call is said to be *in the money*. Similarly if the current price of the underlying asset is less than the exercise price of a call option, it is said to be *out of the money*. The *near the money* call options are those whose exercise price is slightly greater than current market price of the asset. *Premium* is the price paid by the buyer to the seller of the option, whether put or call. A call option when it is written against the asset owner by the option writer is called a *covered option*, and the one written without owning the asset is called *naked option*.

A complex variety of options exist in the world options markets. There are simple options such as commodity options, stock options, bond options, currency options, stock index options, and options on futures: compound options such as swaptions, flortions and captions: and synthetic options which combine options and futures.

Options Position

There are two sides of every option contract. On one side there is the investor who has taken long position (i.e., has bought the option). On the other side is the investor who has taken the short position (i.e., has sold or written the option). The writer of an option receives cash up front, but has the potential liabilities later. The writer's profit or loss is the reverse of that for the purchaser of the option. There are four type of option position:

A long position in a call option

A long position in a put option

A short position in a call option

A short position in a put option

It is often useful to characterize European option positions in terms of the terminal value or payoff to the investor at maturity. The initial cost of the option is then not included in the calculation.

If K is the strike price and S_T is the final price of the underlying asset, the payoff from a long position in a European call option is

$$\max (S_T - K, 0)$$

The option will be exercised if $S_T > K$ and not be exercised if $S_T \leq K$. The payoff to the holder of a short position in the European call option is

$$- \max (S_T - K, 0) = \min (K - S_T, 0).$$

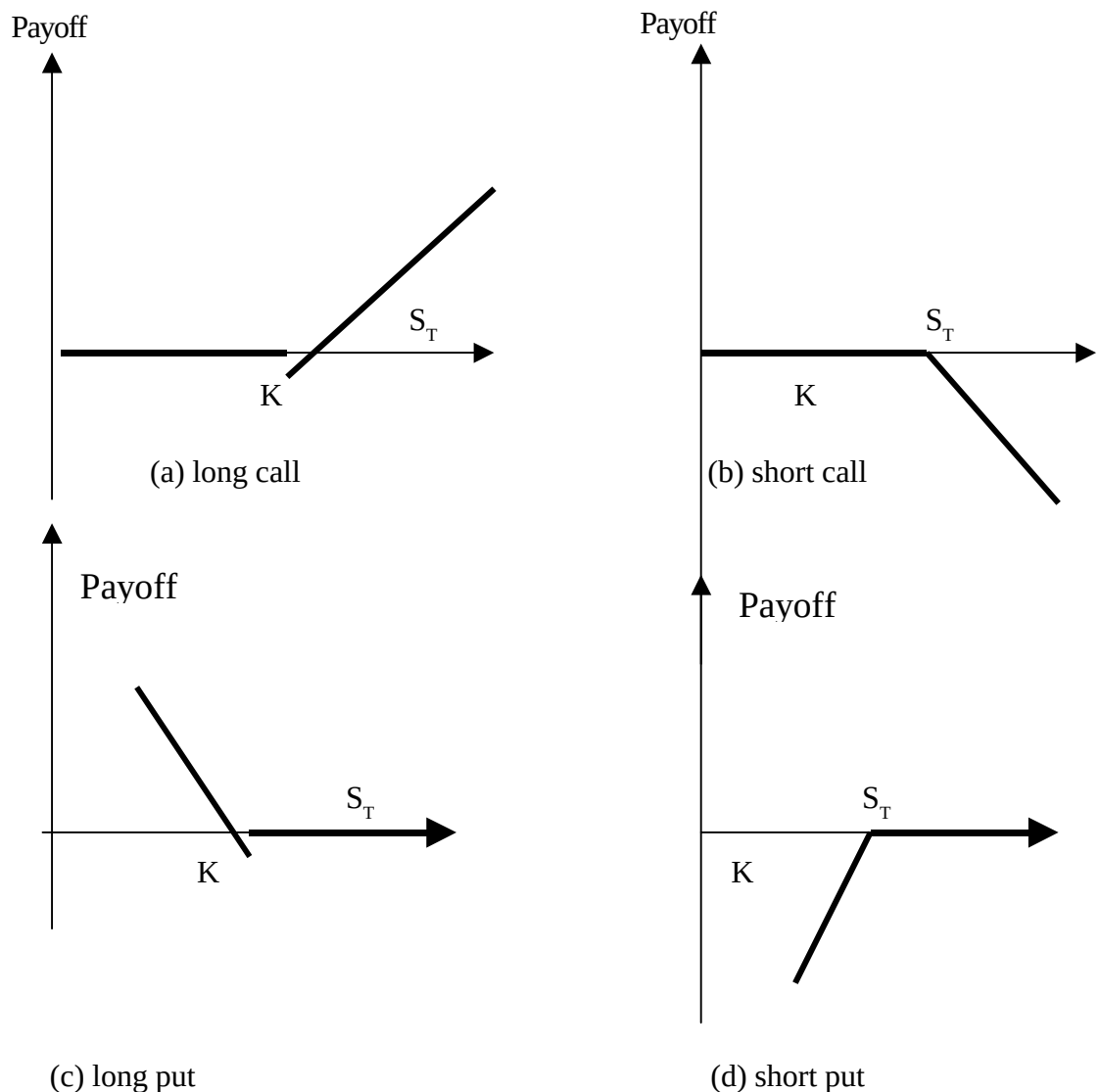
The payoff to the holder of a long position in a European put option is

$$\max (K - S_T, 0) = \min (S_T - K, 0)$$

And the payoffs from a short position in a European put option is

$$- \max (K - S_T, 0) = \min (S_T - K, 0)$$

Payoffs from positions in European options



7.3.4 Swaps

A swap is an agreement between two parties to exchange assets or sets of financial obligations or a series of cash flows for a specified period of time at predetermined intervals. They include both spot and forward transactions in one agreement, and are generally customized transactions. The corporations, banks, individual investors, etc. are now using swaps to arrange complex and innovative financing that reduces borrowing costs, and to increase control over interest rate risk and foreign currency exposure.

While swaps are used for various purposes—from hedging to speculation—their fundamental purpose is to change the character of an asset or liability without liquidating that asset or liability. For example, an investor realizing returns from an equity investment can swap those returns into less risky fixed income cash flows—without having to liquidate the equities. A corporation with floating rate debt can swap that debt into a fixed rate obligation—without having to retire and reissue debt.

The most common type of swap is a “plain vanilla” interest rate swap. In this, a company agrees to pay cash flows equal to interest at a predetermined fixed rate on a notional principal for a number of years. In return, it receives interest at a floating rate on the same notional principal for the same period of time. The floating rate in many interest rate swap agreements is the London Interbank Offer Rate (LIBOR).

The markets have developed a variety of swaps viz., interest rate swaps, coupon swaps, basis rate swaps, bond swaps, substitution swap, intermarket spread swap, swaps with timing mismatches, swaps with options like payoffs, currency swaps etc. Out of this interest rate swaps & currency swaps are the most commonly used swaps.

An interest rate swap is a transaction between two parties involving an exchange of one stream of interest obligations (payments) for another. It has specific maturity on a notional principal amount, which is simply a reference amount against which the interest is calculated; no principal amount ever really changes hands in such a transaction. Maturities range from under a year to over 15 years, but most transactions fall within a two year to 10-year period.

A currency swap is a contract exchanging foreign currency in the spot market with simultaneous agreement to reserve the transaction in the forward market. Both exchange rate and timing of the forward market transaction are specified at the time of the swap. Put differently, in a currency swap, both the principal and interest in one currency are swapped for principal and interest in another currency. On maturity the principal amount are swapped back.

For Example, a company that has borrowed rupees at a fixed interest rate can swap away the exchange rate risk by setting up a contract whereby it receives rupees at a fixed rate in return for dollar at either a fixed or floating interest rate. Currency swap can help to manage both interest rate and exchange rate risk. By setting up a contract whereby it receives Rs at a fixed rate in return for dollars at either a fixed or floating interest rate.

Type of Traders in the Market

The derivative market has been very successful because they have attracted different type of traders because of liquidity. There are three broad categories of traders: hedgers, speculators and arbitrageurs.

- Hedgers use forwards, futures and options to reduce the risk that they face from potential future movements in a market variable.
- Speculators use them to bet on the future direction of a market variable.
- Arbitrageurs take offsetting positions in two or more instruments to lock in a profit.

Put – Call parity

In financial mathematics, **put–call parity** defines a relationship between the price of a European call option and a European put option - both with the identical strike price and expiry. No assumptions other than a lack of arbitrage in the market are made in order to derive this relationship.

An example, using stock options follows, though this may be generalised.

Consider a call option and a put option with the same strike K for expiry at the same date T on some share, which pays no dividend. Let S denote the (unknown) underlier value at expiration.

$$\begin{cases} K & \text{if } S \leq K \text{ (the put has value } (K-S) \text{ and the share has value } S) \\ S & \text{if } S > K \text{ (the put has value } 0 \text{ and the share has value } S) \end{cases}$$

First consider a portfolio that consists of one put option and one share. This portfolio has value:

Now consider a portfolio that consists of one call option and K bonds that each pay 1 (with certainty) at time T . This portfolio at T has value:

$$\begin{cases} K & \text{if } S \leq K \text{ (the call has value } 0 \text{ and the bonds have value } K) \\ S & \text{if } S > K \text{ (the call has value } S-K \text{ and the bonds have value } K) \end{cases}$$

Notice that, whatever the final share price S is at time T , each portfolio is worth the same as the other. This implies that these two portfolios must have the same value at any time t before T . To prove this supposes that, at some time t , one portfolio were cheaper than the other. Then one could purchase (go long) the cheaper portfolio and sell (go short) the more expensive. Our overall portfolio would, for any value of the share price, have zero value at T . We would be left with the profit we made at time t . This is known as a risk-less profit and represents an arbitrage opportunity. Thus the following relationship exists between the value of the various instruments at a general time t :

$$C(t) + K * B(t,T) = P(t) + S(t)$$

where

$C(t)$ is the time- t value of the call

$P(t)$ is the time- t value of the put

$S(t)$ is the time- t value of the share

K is the strike price

and $B(t,T)$ is the time- t value of a bond that pays at T . If a stock pays dividends, they should be included in $B(t, T)$, because option prices are typically not adjusted for ordinary dividends.

If the bond interest rate is assumed to be constant, with value r , $B(t, T)$ is equal to $e^{-r(T-t)}$.

Using the above, and given the (fair) value of any three of the call, put, bond and stock prices one can compute the (implied) fair value of the fourth.

Put-call parity implies:

1) Equivalence of calls and puts

Parity implies that a call and a put can be used interchangeably in any delta-neutral portfolio. If d is the call's delta, then buying a call, and selling d shares of stock, is the same as buying a put and buying $1 - d$ shares of stock. Equivalence of calls and puts is very important when trading options.

2) Parity of implied volatility

In the absence of dividends or other costs of carry (such as when a stock is difficult to borrow or sell short), the implied volatility of calls and puts must be identical.

Check Your Progress 2

1) Explain what you mean by a forwards contract.

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2) Explain the workings of a futures contract.

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3) What is a swap?

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7.4 MODELS OF DERIVATIVE PRICING

7.4.1 Binomial Option Pricing Model

The **binomial options pricing model** provides a generalisable numerical method for the valuation of options. Cox, Ross and Rubinstein first proposed the binomial model in 1979. Essentially, the model uses a “discrete-time” model of the varying price over time of the underlying financial instrument. Option valuation is then via

application of the risk neutrality assumption over the life of the option, as the price of the underlying instrument evolves. The Binomial options pricing model approach is widely used as it is able to handle a variety of conditions for which other models cannot easily be applied. This is largely because the BOPM models the underlying instrument over time – as opposed to at a particular point. For example, the model is used to value American options, which can be exercised at any point, and Bermudan options, which can be exercised at various points. The model is also relatively simple, mathematically, and can therefore be readily implemented in a software (or even spreadsheet) environment. Although slower than the Black-Scholes model, it is considered more accurate, particularly for longer-dated options, and options on securities with dividend payments. For these reasons, various versions of the binomial model are widely used by practitioners in the options markets.

For options with several sources of uncertainty (e.g., real options), or for options with complicated features (e.g. Asian options), lattice methods face several difficulties and are not practical. Monte Carlo option models are generally used in these cases. Monte Carlo simulation is, however, time-consuming in terms of computation, and is not used when the Lattice approach (or a formula) will suffice.

The binomial pricing model uses a “discrete-time framework” to trace the evolution of the option’s key underlying variable via a binomial lattice (tree), for a given number of time steps between valuation date and option expiration.

Each node in the lattice, represents a *possible* price of the underlying, at a *particular* point in time. This price evolution forms the basis for the option valuation.

The valuation process is iterative, starting at each final node, and then working backwards through the tree to the first node (valuation date), where the calculated result is the value of the option.

Option valuation using this method is, as described, a three step process:

- 1) Price tree generation,
- 2) Calculation of option value at each final node,
- 3) Progressive calculation of option value at each earlier node; the value at the first node is the value of the option.

Option value at each final node

At each final node of the tree — i.e., at expiration of the option — the option value is simply its intrinsic, or exercise, value.

$\text{Max} [(S - K), 0]$, for a call option

$\text{Max} [(K - S), 0]$, for a put option:

(Where K is the Strike price and S is the spot price of the underlying asset)

Option value at earlier nodes

At each earlier node, the value of the option is calculated using the risk neutrality assumption. Under this assumption, today’s fair price of a derivative is equal to the discounted expected value of its future payoff.

Expected value is therefore calculated using the option values from the later two nodes (*Option up* and *Option down*) weighted by their respective probabilities —

“probability” p of an up move in the underlying, and “probability” $(1-p)$ of a down move.

The expected value is then discounted at r , the risk free rate corresponding to the life of the option. This result, the “Binomial Value”, is thus the fair price of the derivative at a particular point in time (i.e., at each node), given the evolution in the price of the underlying to that point.

The Binomial Value is found for each node, starting at the penultimate time step, and working back to the first node of the tree, the valuation date, where the calculated result is the value of the option. For an American option, since the option may either be held or exercised prior to expiry, the value at each node is: $\text{Max}(\text{Binomial Value}, \text{Exercise Value})$.

The Binomial Value is calculated as follows.

$$\text{Binomial Value} = [p \times \text{Option up} + (1-p) \times \text{Option down}] \times \exp(-r \times t)$$

7.4.2 The Black Scholes Formula

The **Black–Scholes model** is a model of the evolving price of financial instruments, in particular stocks. The **Black–Scholes formula** is a mathematical formula for the theoretical value of European put and call stock options derived from the assumptions of the model. The formula was derived by Fischer Black and Myron Scholes and published in 1973. They built on earlier research by Edward Thorpe, Paul Samuelson, and Robert C. Merton. The fundamental insight of Black and Scholes is that the option is implicitly priced if the stock is traded.

The Black-Scholes model is used to calculate a theoretical call price (ignoring dividends paid during the life of the option) using the five key determinants of an option's price: stock price, strike price, volatility, time to expiration, and short-term (risk free) interest rate.

The original formula for calculating the theoretical option price (OP) is as follows:

Where:

$$OP = SN(d_1) - Xe^{-rt}N(d_2)$$

$$d_1 = d_2 + \sqrt{t}$$

The variables are:

S = stock price

X = strike price

t = time remaining until expiration, expressed as a percent of a year

r = current continuously compounded risk-free interest rate

v = annual volatility of stock price (the standard deviation of the short-term returns over one year).

$\ln$ = natural logarithm

$N(x)$ = standard normal cumulative distribution function

e = the exponential function

Advantages & Disadvantages of the Model

Advantage: The main advantage of the Black-Scholes model is speed — it lets you calculate a very large number of option prices in a very short time.

Limitation: The Black-Scholes model has one major limitation: it cannot be used to accurately price options with an American-style exercise as it only calculates the option price at one point in time — at expiration. It does not consider the steps along the way where there could be the possibility of early exercise of an American option.

This is the **Black-Scholes equation** for pricing options.

In deriving this equation, we assumed that:

- 1) There are no arbitrage opportunities (no free lunch).
- 2) Short selling of shares is possible at all times.
- 3) No transaction costs or taxes in setting up a portfolio.
- 4) All securities are perfectly divisible.
- 5) Trading can take place continuously.
- 6) The underlying share pays no dividends during the lifetime of the option.
- 7) The risk-free rate r and the share volatility σ are known over the lifetime of the option.

What is the relation between Binomial Options Pricing Model & Black Scholes Model?

The same underlying assumptions regarding stock prices underpin both the binomial and Black-Scholes models: that stock prices follow a stochastic process described by geometric brownian motion. As a result, for European options, the binomial model converges on the Black-Scholes formula as the number of binomial calculation step increases. In fact the Black-Scholes model for European options is really a special case of the binomial model where the number of binomial steps is infinite. In other words, the binomial model provides discrete approximations to the continuous process underlying the Black-Scholes model.

7.5 A BRIEF HISTORY OF DERIVATIVES IN INDIA

The history of derivatives is surprisingly longer than what most people think. Some texts even find the existence of the characteristics of derivative contracts in incidents of Mahabharata. Traces of derivative contracts can even be found in incidents that date back to the ages before Jesus Christ. However, the advent of modern day derivative contracts is attributed to the need for farmers to protect themselves from any decline in the price of their crops due to delayed monsoon, or overproduction. Derivatives have had a long presence in India. The commodity derivative market has been functioning in India since the nineteenth century with organized trading in cotton, through the establishment of Cotton Trade Association in 1875. Since then contracts on various other commodities have been introduced as well. Exchange

traded financial derivatives were introduced in India in June 2000 at the two major stock exchanges, NSE and BSE. There are various contracts currently traded on these exchanges. National Commodity & Derivatives Exchange Limited (NCDEX) started its operations in December 2003, to provide a platform for commodities trading. The derivatives market in India has grown exponentially, especially at NSE. Stock Futures are the most highly traded contracts on NSE accounting for around 55% of the total turnover of derivatives at NSE, as on April 13, 2005.

Derivative trading in India takes place either on a separate and independent Derivative Exchange or on a separate segment of an existing Stock Exchange. Derivative Exchange/Segment function as a Self-Regulatory Organisation (SRO) and SEBI acts as the oversight regulator. The clearing & settlement of all trades on the Derivative Exchange/Segment would have to be through a Clearing Corporation/House, which is independent in governance and membership from the Derivative Exchange/Segment. Derivative products have been introduced in a phased manner starting with Index Futures Contracts in June 2000. Index Options and Stock Options were introduced in June 2001 and July 2001 followed by Stock Futures in November 2001. Sectoral indices were permitted for derivatives trading in December 2002. Interest Rate Futures on a notional bond and T-bill priced off ZCYC have been introduced in June 2003 and exchange traded interest rate futures on a notional bond priced off a basket of Government Securities were permitted for trading in January 2004.

Check Your Progress 3

- 1) Compare and contrast the binomial model and the Black-Scholes formulation of derivative pricing.

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- 2) Briefly describe the evolution of derivatives in India.

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7.6 LET US SUM UP

This unit continued the discussion that was started in units 5 and 6 regarding assets and their pricing. The units discussed a type of asset whose value is determined by, and influenced by the price of an underlying asset. The unit began with the basic concept of, and idea behind, a derivative. Then the unit embarked on a long discussion of the various types of derivatives, including forward contracts, futures, and swaps.

The unit then went on to a discussion of pricing of derivatives, discussing the binomial model, and the Black-Scholes formula, and discussed the differences between the two models. the unit concluded with a brief history of derivatives in India.

7.7 KEY WORDS

Arbitrageurs	: Investors who seek discrepancy in Security prices in order to earn riskless return
Call option	: An option that gives the its holder the right to buy an asset at a fixed price during a certain period
Forward Contract	: An agreement between two parties to exchange an asset for cash at a predetermined future date for a price that is specified today
Hedge	: An investment purchased against another investment in order to counter any loss made by either
Interest Rate Future	: Future contracts on fixed income securities such as treasury bills bonds and CDs
Interest Rate Options	: Option contracts on fixed income securities such as treasury bills
Interest Rate Parity	: The concept that difference between the interest rates in two countries is equal to the difference between the forward and spot rate of the respective countries
Long Position	: A position in which the investor is entitled to receive an asset in future. It is the position of buyer in the security
Margin	: The part of the transaction value that the customer must pay to initiate transaction with the other part being borrowed from the broker. There are two types of margin initial margin & maintenance margin.
Option Contract	: An Agreement that confers the right to buy or sell an asset at a set price at some future date. The right is exercisable at the discretion of the option buyer
Put Option	: An option that gives the holder the right to sell an asset at a fixed price during a certain period
Short Position	: A position in which the investor is obliged to deliver an asset in future. In other words it is a position of a seller of a security
Spot Rate	: Exchange rate which applies to 'on the spot delivery of the currency – in practice it means delivery in two days after the day of trade
Swap Contract	: An agreement between two parties (counterparties) to exchange assets or a series of cash flows for a specified period of time at predetermined intervals

7.8 SOME USEFUL BOOKS

Bhole, L M . (2004) *Financial Institutions and Markets 4th edition*, TataMcGraw-Hill, New Delhi:

Dothan, U. (1990), *Prices in Financial Markets*, Oxford University Press, New York

Hull, John , (2002) *Options, Futures and other Derivatives* Prentice-Hall of India, New Delhi.

7.9 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See section 7.2 and answer
- 2) See section 7.2 and answer

Check Your Progress 2

- 1) See section 7.3 and answer
- 2) See section 7.3 and answer
- 3) See section 7.3 and answer

Check Your Progress 3

- 1) See section 7.4 and answer
- 2) See section 7.5 and answer

UNIT 8 STRUCTURE OF FINANCIAL MARKETS

Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Institutional Structure of Financial Markets
- 8.3 Primary Market Structure
 - 8.3.1 Securities and Exchange Board of India (SEBI)
 - 8.3.2 Primary Market Intermediaries
- 8.4 Secondary Market Structure
 - 8.4.1 Stock Exchanges
 - 8.4.2 Depository System
 - 8.4.3 Custodial Services
- 8.5 Let Us Sum Up
- 8.6 Key Words
- 8.7 Some Useful Books
- 8.8 Answers/Hints to Check Your Progress Exercises

8.0 OBJECTIVES

After going through this unit, you will be able to:

- get a view of the institutional structure of the financial markets;
- get acquainted with major stakeholders in primary market; and
- develop awareness about different constituents of the secondary market.

8.1 INTRODUCTION

Financial markets are the centres or arrangements that provide facilities for buying and selling out financial claims and services. The participants on the demand and supply sides of these markets are financial institutions, agents, brokers, dealers, borrowers, lenders, savers, and others. Who are inter-linked by the laws, contracts, covenants and communication networks?

The main organised markets in India are the money market and capital market. While the primary market deals in new issues, the secondary market is meant for trading in outstanding or existing securities. There are two components of the secondary market: Over the counter (OTC) market and the Exchange traded market. The government securities market is an OTC market. In an OTC market, spot trades are negotiated and traded for immediate delivery and payment while in the exchange trade market, trading takes place over a trading cycle in stock exchanges.

8.2 INSTITUTIONAL STRUCTURE OF FINANCIAL MARKETS

As stated above, financial markets are classified as (i) primary markets and (ii) secondary markets. Primary market is also known as a *direct* market, whereas a

secondary market is called an *indirect* market. The primary market deals in the new financial claims or new securities deals in the new financial claims or new securities and, therefore, they are also known as the *new issues markets*. On the other hand, secondary markets deal in securities already issued or existing or outstanding. The primary markets mobilise savings and they supply fresh or additional capital to business units. Although secondary markets do not contribute directly to the supply of additional capital, they do so indirectly by rendering securities issues on the primary markets liquid. Stock markets have both the primary and secondary market segments.

The institutional structure of the primary markets differs from that of the secondary markets. Let us have a look on each of these:

8.3 PRIMARY MARKET STRUCTURE

The primary market is a market for new issues. It is a market for fresh capital. Funds are mobilised in the primary market through (i) prospectus, (ii) rights issues, and (iii) private placement. Bonus issues is also one of the ways to raise capital but it does not bring in fresh capital.

- i) In the **prospectus** route, new issues of capital are offered to the public through prospectus and the public subscribes directly. Wide publicity about the offer is given through the media.
- ii) **Rights issue** is the issue of new shares in which existing shareholders give pre-emptive rights to subscribe to the new issues on a pro-rata basis. The right is given in the form of an offer to existing shareholders to subscribe to a proportionate number of fresh, extra shares at a price. Companies issue right shares by sending a letter of offer to the shareholders whose names are recorded in the books on a particular date. A shareholder has four options in case of rights (a) he may exercise his rights, i.e., buy new shares of the offered price (b) renounce his rights and sell them in the open market (c) renounce part of his rights and exercise the remainder and (d) choose to do nothing.
- iii) The direct sale of securities by a company to some select people or to institutional investors is called **private placement**. No prospectus is issued in private place. Private placement covers equity shares, preference shares, and debentures. It offers excess to capital more quality than the public issue and is quite inexpensive on account of the absence of various issue expenses.
- iv) At times, companies distribute profits to existing shareholders by way of fully paid **bonus shares** instead of paying them a dividend. Bonus shares are issued in the ratio of the existing shares held. The shareholders do not have to pay for bonus shares but the retained earnings are converted into capital. Thus, bonus shares enable a company to restructure its capital.

There are three categories of participants in the primary market. They are the issuers of securities, investors in securities, and the participants. The last render services to both the issuers and investors to enable the sale and purchase of securities. The lead merchant banker performs most of the pre-issue and post-issue activities. The pre-issue activities relate to drafting, examining and issuing of prospectus, application forms, advertisement, and so on. Post-issue activities relate to the allotment, refund and dispatch of certificates. The Securities and Exchange Board of India (SEBI) regulates the primary market.

8.3.1 Securities and Exchange Board of India (SEBI)

The Securities and Exchange Board of India (SEBI) was established through notification on April 12, 1988 to keep pace with the growing requirement of curbing unhealthy practices in fast expanding securities market and to protect interest of investors. The SEBI Act was passed on April 4, 1992, which empowered SEBI to regulate entire gamut of activities in primary and secondary markets. SEBI exercises control over new issues registration and regulation of market intermediaries, regulation of mutual funds, regulating listing of securities, imposing a code of conduct on merchant bankers, underwriters, brokers, etc., prohibition of unfair trade practices, and insider trading, regulation of take-overs, etc. SEBI also makes an attempt to establish and promote self-regulatory organisations in securities market and ensure that stock exchanges discharge their self-regulatory role with efficiency and integrity.

The Preamble of the SEBI Act provides for the establishment of a Board to protect the interests of investors in securities and to promote the development of and to regulate the securities market. The following functions have been entrusted to the Board:

- i) Regulating the business in stock exchanges and any other securities markets;
- ii) Registering and regulating the working of stock brokers, sub-brokers, share transfer agents, bankers to an issue, merchant bankers, underwriters, portfolio managers, investment advisers and such other intermediaries who may be associated with securities markets in any manner;
- iii) Registering and regulating the working of collective investment schemes including mutual funds;
- iv) Promoting and regulating self-regulatory organisations;
- v) Prohibiting fraudulent and unfair trade practices relating to securities market;
- vi) Promoting investors' education and training of intermediaries of securities market;
- vii) Prohibiting insider trading in securities;
- viii) Regulating substantial acquisition of shares and take-over of companies;
- ix) Calling for information from, undertaking inspection, conducting inquiries and audits of the stock exchanges and intermediaries and self-regulatory organisations in the securities market;
- x) Levying fees or other charges for carrying out the above purposes; and
- xi) Conducting research for the above purposes.

In accomplishing the above objectives SEBI is expected to be responsive to the needs of the following major groups:

- a) Investors;
- b) The Companies raising capital;
- c) Primary market intermediaries; and
- d) Stock market brokers and intermediaries.

SEBI exercises powers under Section 11 and 11B of SEBI Act, 1992 and other regulations.

These empower SEBI to:

- Ask any intermediary or market participant for information.
- Inspect books of depository participants, issuers or beneficiary owners.
- Suspend or cancel a certificate of registration granted to a depository participant or issuer.
- Request the RBI to inspect books of a banker to an issue, and suspend or cancel the registration of the banker to an issue.
- Suspend or cancel registration issued to foreign institutional investors.
- Investigate and inspect books of accounts and records of insiders.
- Investigate an acquirer, a seller, or merchant banker for violent takeover rules.
- Suspend or cancel the registration of a merchant banker.
- Investigate the affairs of mutual funds, their trustees, and asset management companies.
- Investigate any person dealing in securities on complaint of contravention of trading regulation.
- Suspend or cancel the registration of errant portfolio managers.
- Cancel the certificate of registrars and share transfer agents.
- Cancel the certification of brokers who fail to furnish information of transactions in securities or who furnish false information.

SEBI's market surveillance essentially focuses on:

- i) Policy formulation for introduction of surveillance systems at the stock exchanges to bring integrity, safety and stability in the Indian securities markets;
- ii) Overseeing the surveillance activities of the stock exchanges including the monitoring of market movements by them;
- iii) Inspection of the surveillance cells of the stock exchanges;
- iv) Preparation of reports and studies on market movements, which SEBI circulates periodically to the Government of India and to securities markets regulators from other countries;

The primary responsibility of market surveillance has been entrusted to the stock exchanges. However, SEBI keeps a proactive oversight on market monitoring and in exceptional circumstances it analyses the same.

Assessment: SEBI, no doubt, acts as a powerful regulator in the securities markets. But, nevertheless, some serious shortcomings in its functioning and operations have been pointed out. Among these, the more important are as follows:

One, on reading the rules, regulations, guidelines, directions and norms issued by the SEBI, one doubts whether one is living in the 'liberalised' or 'prudential' regulation as opposed to 'statistic control' environment at all. It is difficult to believe that 'self-regulation' and 'regulation by exception' is really the cornerstones of the SEBI's regulatory philosophy. The number of rules, etc: prescribed by SEBI has become

too large; it has been adding to, and changing them too often and in a back and forth fashion. This has created a veritable maze of a plethora of regulations. This has led to a very high level of uncertainty and confusion.

Two, there is a widespread perception in the financial markets that SEBI is not really desirous about reforming the system and protecting the individual and small investors. It has quite often failed to penalise the people responsible for causing abnormal price fluctuations on the stock market. There has been a lack of will, dithering and hesitancy on the part of SEBI to strike against the wrong doers. Even certain well-publicised market manipulations have gone unpunished.

Three, the regulatory ineffectiveness of the SEBI in certain cases has been due to its concentration on symptoms rather than the root causes. The SEBI failure appears to be partly deliberate also. There is a feeling among market watchers that, as in many other countries, the SEBI as a regulatory has been rather soft and unduly favourable to the securities industry; it has been more corporate friendly than investor friendly.

Four, it is imperative that SEBI should become more effective, efficient, socially accountable, and small-investor friendly. It has often complained of having insufficient authority. The SEBI ought to be made a truly autonomous regulatory authority which it is not at present.

8.3.2 Primary Market Intermediaries

The principal intermediaries in the primary markets are merchant bankers / lead managers, underwriters, bankers to the issue, brokers to the issue, registrars and share transfer agents, and debenture trustees.

A) Merchant Bankers

The lead merchant banker performs most of the pre-issue and post-issue activities. Their importance is reflected in the major services/functions such as, determining the composition of the capital structure (type of securities to be issued), draft of prospectus (offer documents) and application forms, compliance with procedural formalities, appointment of registrars to deal with the share application and transfers, listing of securities, arrangement of underwriting / sub-underwriting, placing of issues, publicity and advertising agents printers, and so on. In view of the overwhelming importance of the merchant-bankers in the process of capital issues, it is now mandatory that all public issues should be managed by member banker(s) functioning as the lead manager(s).

Responsibilities/Obligations of Merchant Bankers

A merchant banker has the following responsibilities:

- Enter into a contract with the issuing company clearly specifying their mutual rights, obligations and liabilities relating to the issue, particularly relating to disclosures, allotment and refund.
- Submit a copy of the above contract to SEBI at least one month before the opening of the issue for subscription. In case of more than one merchant banker, simultaneously submit a statement detailing their respective responsibilities.
- Refuse acceptance of appointment as merchant banker, if the issuing company is an associate.

- Do not associate with a merchant banker who does not hold SEBI registration certificate.
- Accept a minimum underwriting obligation of 5 per cent of total underwriting commitment or Rs. 25 lakh, whichever is less, or a range for underwriting of an equal amount by a merchant banker associated with the issue and intimate the same to SEBI.
- Submit the 'Due Diligence Certificate' to SEBI at least two weeks before the opening of the issue for subscription after verification of the contents of the prospectus/letter of offer regarding the issue and reasonableness of the views expressed therein certifying that (i) they are in conformity with the documents, materials and papers relevant to the issue (ii) all legal requirements relating to the issue have been fully complied with, and (iii) all disclosures are true, fair and adequate to enable the investing public to make a well-informed decision regarding investment in the proposed issue.
- Submit to SEBI various documents such as, particulars of the issue, draft prospectus/letter of offer and other literature to be circulated to the investors/shareholders, etc., at least, two weeks before the date of filing them with the registrar of companies and regional stock exchanges.
- Ensure that modifications and suggestions made by SEBI regarding above documents have been incorporated.
- Continue to remain fully associated with the issue till the subscribers have received share/debenture certificates or the refund of the excess application money
- Not to acquire securities at any company on the basis of unpublished price sensitive information obtained in the course of discharge of any client or any other person.
- Submit complete particulars with SEBI within 15 days of the acquisition of securities of the company whose issue the merchant banker is managing.
- Disclose to SEBI following: (i) its responsibilities regarding the management of the issue (ii) any change in the information/particulars previously furnished with SEBI having bearing on certificate of registration granted to it, (iii) details relating to the breach of capital adequacy norms, (iv) names and addresses of the companies whose issues it has managed or has been associated with, and (v) information regarding its activities as manager, underwriter, consultant or adviser to the issue.

Each merchant banker has to abide by the provisions of the SEBI Act and the rules and regulations framed by SEBI relating to its activities, both in the form of do's and don'ts.

A merchant banker who fails to comply with any condition subject to which the certificate of registration has been granted by the SEBI and/or contravenes any of the provisions of the SEBI Act, rules and regulations, is liable to any of the two penalties (a) suspension of registration, or (b) cancellation of registration. A merchant banker cannot carry on any activity as merchant banker with effect from the date of suspension or cancellation, till registration is restored by the SEBI.

B) Underwriters

Another important intermediary in the new issue market is the underwriter

An underwriters make a commitment to get the underwritten issue subscribed either by others or by themselves. They agree to take up the unsubscribed portion of the issue. They render this service for a commission agreed upon between the issuing company and the underwriter subject of the ceiling under the companies Act.

Underwriting services are available from brokers, investment companies, commercial banks and term lending institutions.

Underwriters are appointed by the issuing company in consultation with the merchant bankers/lead managers. They have to satisfy that in their opinion, the underwriters' assets adequate to meet their obligations. A statement to this effect is also to be incorporated in the prospectus.

Only such person (an individual, firm or a company) who has obtained certificate of registration from SEBI, can act as underwriter. Merchant bankers and stock brokers already having a valid certificate of registration from SEBI do not require a separate registration from SEBI for working as underwriters.

Various operational guidelines/institutions relating to underwriting to be followed by underwriters can be briefly stated as follows:

- An underwriter has to comply with all requirements regarding registration with SEBI, agreement with the client company and general responsibilities.
- Before signing underwriting agreement with the issuing company, the underwriter should satisfy himself that all terms and conditions regarding disclosure in the prospectus and its filing with Registrar of Companies have been complied with.
- Ensure that the prospectus is delivered to ROC within 30 days of the underwriting agreement or within such an extended time as approved by the underwriter in writing, subject to the limits within the law.
- In case after filing the prospectus with ROC the issuing company makes any additional disclosure in the interest of investors as stipulated by SEBI / lead managers, the underwriter is bound to comply with them.
- Additional disclosures cannot give any right to underwriter to avoid or reduce his obligations, unless certified by SEBI as material in nature and essential for underwriting agreement.
- An underwriter can arrange for sub-underwriting but he is not responsible for any failure or default on the part of such underwriters.
- An underwriter has to fulfil his obligation regarding devolved amount in case of under-subscription within 30 days of the receipt of communication.
- Having fulfilled his obligations, the underwriter is entitled to underwriting commission and brokerage at the agreed rate, subject to limits under the companies Act, within 15 days from the date of completion of allotment.

In case the underwriter fails to meet his obligations regarding devolved amount within 30 days of the communication, the issuing company can take necessary measures and commence proceeding against the underwriter including the right to claim damages for any loss suffered due to default by the underwriter.

C) Bankers to the Issue

Bankers to the issue constitute yet another important intermediary in the new issues market. They are engaged in activities such as acceptance of applications along

with application money from the investors in respect of issue of capital and refund of application money.

The banker to the issue, just like other intermediaries, is subject to different rules and regulations and a code of conduct. The major obligation of a banker to an issue can be briefly stated as follows:

- Each banker to an issue has to enter this an agreement with the issuing company detailing the number and addresses of collection centres at which applications and application money are to be received, the fee for the services and other terms and conditions of the appointment.
- The designated controlling branch of the banker to an issue has to submit to the issuing company/registrar to an issue a daily statement giving the details regarding the number of applications and the amount of money received from the investors.
- A banker to an issue has to submit the following information to SEBI:
 - i) The details of issues for which he has been engaged as a banker to an issue;
 - ii) The number of applications and the details of application money received;
 - iii) The date-wise details when applications from were forwarded to the issuing company/registrar to an issue; and
 - iv) The date-wise details of the amount of refund to the investors

A banker to an issue is duty bound to inform SEBI about any RBI action taken against him regarding issue payment. SEBI registration is deemed to be suspended/ cancelled if the banker to an issue has been prohibited to carry on his activities due to such disciplinary action.

- A banker to an issue has to maintain books of accounts, records and documents pertaining to all matters regarding which he may be required to submit details to SEBI, including the names and addresses of the investors, for a minimum period of three years from the completion of the issue.
- A banker to an issue has to adhere to the prescribed code of conduct, which is similar to that for a merchant banker or an underwriter. In addition, he should be adhere to the following:
 - i) do not keep blank application forms bearing broker's stamp at the work premises or at the entrance of the bank.
 - ii) do not accept application after office hours, or on bank holidays, or after the date of the closure of issue.
 - iii) do not act at any time in collusion with other agents in a manner detrimental to the interest of small investor.
 - iv) abide by all acts, rules, regulations, notifications, directions, circulars, instructions and guidelines issued by the Government, RBI, Indian Banks Association and SEBI which are relevant to his operations as a banker to an issue.

In case of default, SEBI is empowered to (a) suspend the registration certificate, or (b) cancel the registration certificate of a banker to an issue.

D) Brokers to the Issue

Brokers are the persons mainly concerned with the procurement of subscription to the issue from the prospective investors. The appointment of brokers is not compulsory and the companies are free to appoint any number of brokers. The managers to the issue and the official brokers organise the preliminary distribution of securities and procure direct subscriptions from as large or as wide a circle of investors as possible. Their active assistance is indispensable for broadbasing the issue and attracting investors. By and large, the leading merchant bankers in India who act as managers to the issue have particulars of the performance of brokers in the country. The company in consultation with the stock exchange writes to all active brokers of all exchanges and obtain their consent to act as brokers to an issue. Thereby, the entry of an experienced and unknown agencies in the field of new issue activity as issue managers, underwriters, brokers and so on is discouraged.

Brokers have to work within the guidelines prescribed by the SEBI; they have also to observe the bye-laws laid down by the stock exchanges.

E) Registrars to an Issue and Share Transfer Agents

The registrars to an issue, as an intermediary in the primary market, carry an activities such as collecting application from the investors, keeping a proper record of applications and money received from investors or paid to the seller of securities sand assisting companies in determining the basis of allotment of securities in consultation with stock exchanges, finalising the allotment of securities sand processing/despatching allotment letters, refund orders, certificates and other related documents in respect of issue of capital.

The share transfer agents maintain the records of holders of securities or on behalf of companies, and deal with all matters connected with the transfer/redemption of its securities.

To carry on with their activities, registrars and the share transfer agent must be registered with the SEBI which can also renew the certificate of registration. The registration is granted by the SEBI on the basis of the consideration of all relevant matters and, in particular, the necessary infrastructure, past experience and capital adequacy. It also takes into account the fact that any connected person has not been granted registration and any director/partner/principal officer has not been convicted for any offence involving moral furniture or has been found guilty of any economic offence.

A registrar/share transfer agent who fails to comply with any condition to which registration is granted, or contravenes any of the provision of the SEBI Act, rules/regulations and stock exchange bye-laws, rules and regulations i.e, liable to suspension or cancellation of registration.

Check Your Progress 1

- 1) Describe in brief the two components of financial markets. How is secondary market different than the primary market?

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2) What are functions of merchant bankers ? What are their obligation?

3) State in brief the obligation of a banker to an issue.

8.4 SECONDARY MARKET STRUCTURE

Secondary market in India has shown maturity by registering enormous growth in recent years in terms of the number of listed companies, market capitalisation, market value listed companies to GNP, number of shareholders, and so on. There are 23 recognised stock exchanges in the country. The organisation of stock exchange varies: 14 are public limited companies, 6 are companies limited by guarantee and 3 are voluntary non-profit organisations. Besides stock exchange, an efficient depository system and a system that provides custodial services have been developed. These are all sign of growing maturity of secondary market in India.

8.4.1 Stock Exchanges

After the initiation of reforms in 1991, the Indian secondary market has a three-tier form:

- i) Regional Stock Exchanges
- ii) National Stock Exchange (NSE)
- iii) Over the Counter Exchange of India (OTCEI).

The NSE was set up in 1994. It was the first modern stock exchange to bring in new technology, new trading practise, new institution and new products. The OTCEI was set up in 1992 as a stock exchange providing small and medium sized companies the meant o generate capital.

In all, there are 23 exchanges in India – 19 regional stock exchanges, BSE, NSE, OTCEI and the Interconnected Stock Exchange of India (ISE). The ISE is a stock exchange of stock exchanges. The 19 regional stock exchanges are located at Ahmedabad, Bangalore, Bhubneshwar, Kolkata, Cochin, Coimbatore, Delhi, Guwahati, Hyderabad, Indore, Jaipur, Kanpur, Ludhiana, Chennai, Mangalore, Pune,

patina, Rajkot and Vadodara. They operate under the rules, by-laws and regulations approved by the government and SEBI.

The regional stock exchanges are managed by a governing body consisting of elected and nominated members. The trading members, who provide working services, own, control and manage the exchanges. The governing body is vested with wide ranging powers to elect office bearers, set up committees, admit and expel members, manage properties and finances of the exchange, resolve disputes and conduct day-to-day affairs of the exchange.

The OTCEI and NSE are demutualised exchanges wherein the ownership and management of the exchange are separated from the right to trade on exchange.

Brokers are members of the stock exchanges. They enter trade either on their account or on behalf of their clients. They are given a certificate of registration by SEBI and they have to comply with the prescribed code of conduct. Over a period of time, many brokers with proprietary and partnership firms have converted themselves into corporate entities.

Check Your Progress 2

- 1) Mention the role and responsibilities of underwriters in an issue of new capital.

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- 2) Who are 'bankers to an issue'? What are their functions.

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- 3) What are stock exchanges?

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8.4.2 Depository System

In the post-liberalisation period, as the capital markets matured there too place a tremendous increase in the volume of activity. The traditional settlement and clearing

system proved to be inadequate due to operational inefficiencies. Hence, there emerged a need to replace this traditional system with a new system called 'Depository System'.

Depository, in very simple words, means a place where something is deposited for safekeeping. A depository is an organisation which holds securities of a shareholder in an electronic form and facilitates the transfer of ownership of securities on the settlement dates.

The depository system revolves around the concept of paperless or scripless trading because the shares in a depository are held in the form of electronic accounts, i.e., in a dematerialised form. This system is similar to the opening of an account in a bank wherein a bank holds money on behalf of the investor and the investor has to open an account with Bank to utilise its services. Cash deposits and withdrawals are made in a bank, in lieu of which a receipt and a passbook are given, while in depositories, scrips are debited and credited and an account statement is issued to the investor from time to time. An investor in a bank deals directly with a bank while an investor deals through a depository participant in a depository.

The need for depository system arose primarily because of the following factors:

- Inordinate delays in transfer of securities.
- Return of share certificate as bad deliveries on account of forged signatures/ mismatch of signatures or face certificate/forged transfer deed.
- Delay in the receipt/non-receipt of securities after allotment / refund orders to non-allottees.
- Delay in getting duplicate shares/debentures, certificates, and
- Inadequate infrastructure in banking and postal segments to handle a large volume of application and storage of share certificates.

The bottlenecks became more pronounced with every increase in the number of investors and volume of trading in securities.

In response the depositories Act 1996 was enacted. The Act vests SEBI with the powers of registration of depositories and participants and to approve or amend the bye-laws of a depository. The National Securities Depository limited (NSDL) was set up in 1996. the NSDL was sponsored by the IDBI, the UTI and the NSE.

The system of depositories has the following characteristics:

- The holders of existing securities have choice of either continuing with the existing share certificate or opt for the depository mode.
- Issuers of new securities give an option to investors either to opt for physical delivery of share certificates or join the depository made.
- The investors opting for depository mode continue to enjoy the economic benefits from the shares and the voting rights.
- The shares in depositories are fungible, i.e., They do not have distinct number or distinct identity.
- Investors are allowed to exist from the depository and they can claim share certificate from the company by getting their names substituted as the registered shareholder in place of the depository.

- After opting for depository mode, the share certificates of the investors get dematerialised and their names are entered in the books of participants as beneficial owners. In the register of the name of the depository as the registered owner of securities.
- The investors joining the depository system have to register with or more participants who are agents of the depositories. Such participants are custodial agencies, such as banks, financial institutions, etc.,

Safeguards have been built into the regulations to prevent manipulation of records and transactions in the depository system. The safeguards include protection against unauthorised access to systems, standard transmission and prescribed formats for electronic communication, controlled access mechanisms to data storage procedure and facilities for ensuring protection of records against loss or destruction and arrangements for back-up of records and data. The provision is also to be made for insurance and other arrangements for indemnifying the beneficial owners.

Benefits of depositories to various interest groups are as follows:

- I) Benefits to investors. Depository system benefits investors in the following ways:
 - Speedy transfer of shares, etc
 - Facility of dematerialisation and rematerialisation
 - Trading risks avoided
 - Indemnification of certain losses
 - Risk of fake and stolen shares avoided
 - Daily reconciliation also protects investors
 - Share transfer cannot be refused
 - Beneficial owner to be the actual owner
 - No Stamp duty
 - Low brokerage cost
 - Low custody charges
 - Dematerialise securities are highly fungible
 - Periodic consolidated information
- II) Benefits to the Issuer. The issuers get the following benefits:
 - It facilitates proper distribution of benefits to the beneficial owners of the securities
 - The volume of paper work comes down
 - Depositories facilitate wider spread of shareholding over a large geographical area
- III) Benefits to the Intermediaries. These are as follows:
 - As the problem of bad delivery or fake shares get eliminated from the system, banks and other lending institutions find it easier and safer to lend funds against dematerialised securities.

- The brokerage rates come down

IV) Benefits to lending Banks. These are as follows:

- Freedom from replacing securities in case, of book closures and would have been the case for physical shares.
- Facilitates immediate transfer of securities in the bank's name in the event of default by the borrower, thereby giving an immediate opportunity to the bank to sell.
- Makes switching of portfolio convenient.
- Results in lower processing cost as handling of papers is minimised.
- Simplifies creation of bank's charge on securities bent against, thereby freeing the bank from the problems arising out of transfer deeds and other related matters.

In short, an effective and fully developed depository system is essential for maintaining and enhancing market efficiency, which is one of the core characteristics of a mature capital market.

8.4.3 Custodial Services

The provision of efficient custodial services forms an important element in the evolution of a mature stock market system.

Custodian services are provided by the custodians. Custodian services are different than depositories. A custodian is an intermediary who keeps the shares of the clients in custody or is the keeper of the accounts of its clients. A custodian is not only a safe keeper of share certificates and a trustee of the same but also provides ancillary services such as physical transfer of share certificates, collecting dividends and investment warrants, and conforming to transfer regulations. Besides these, it updates clients on their investment status. To claim benefits on behalf of its clients, a record dates, bonus and rights issues.

Recognising their importance in the securities market, the SEBI custodian of Securities Regulations 1996 was framed for the proper conduct of their business. According to SEBI regulations, custodial services in relation to securities mean (i) safe-keeping of the securities of a client who enters into an agreement to avail of these securities, and (ii) providing services incidental thereto.

Stock Holding Corporation of India Ltd (SHCIL)

SHCIL was promoted by seven all – India financial institutions – IDBI, ICICI, IFCI, IRBI, UTI, LIC, GIC and its subsidiaries – was incorporated in 1986. It commenced operations in 1988.

SHCIL was established to provide well-developed and fully automated infrastructural facilities for trading, clearance, settlement, and depository services for securities and monetary instruments. The objectives of the SHCIL are to provide services which include market operations, corporation actions, safekeeping, custodian management, registration, transfer and reporting. Support services include fund transfer and data bank information feeds. SHCIL handles market operations and provides custodial services to financial institutions and mutual funds. Apart from rendering custodial services, it also handles transfers and collects dividends and

interest in respect of securities on behalf of sponsoring institutions, stock brokers and other investors. Its business is divided into five groups: clearing services, registration/transfer, processing, safekeeping, corporate action and benefits collections and management information system (MIS).

Check Your Progress 3

- 1) What are stock exchanges ? What are their functions?

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- 2) Bring out the need and role of depository system in secondary markets.

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- 3) What do you mean by custodial services? What in their significance?

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8.5 LET US SUM UP

- 1) Financial markets are classified as
 - i) primary markets and
 - ii) secondary markets
- 2) Primary market deals in the new financial claims and new securities, and therefore, is also known as the new issues market
- 3) Secondary market deals in securities already issued or existing or outstanding
- 4) SEBI is the regulatory authority both for the primary market and the secondary market
- 5) In the primary market main principal market intermediaries are:
 - i) merchant bankers
 - ii) underwriters
 - iii) bankers to the issue, and
 - iv) registrars and share transfer agents
- 6) In the secondary market, principal role is played by the stock exchanges. Recent innovation include depository system and custodial services.

8.6 KEY WORDS

Brokerage	: It is the commission charged by the brokers for purchase/sale transactions done through them.
Dematerialisation	: It is the process by which shares in the physical/paper form are cancelled and credit in the form of electronic balance is maintained on highly secure system at the depository
Rematerialisation	: It is the process through which shares in electronic form in depository are converted into physical form
Settlement	: It refers to scrip-wise netting of trades by a broker after the trading period is over
Transmission	: It is the lawful process by which the ownership of securities is transferred to the legal heir of the deceased.

8.7 SOME USEFUL BOOKS

Bhole, L.M, (2004). *Financial Institutions and Markets*, Tata McGrawHill, New Delhi.

Khan, M. Y. (2003), *Indian Financial System* Tata McGraw, New Delhi.

Pathak, Bharati V. (2003), *Indian Financial System*, Pearson, New Delhi.

8.8 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See section 8.2
- 2) See section 8.3.2
- 3) See section 8.3.2

Check Your Progress 2

- 1) See section 8.3.2
- 2) See section 8.3.2.
- 3) See section 8.4.1

Check Your Progress 3

- 1) See section 8.4.1
- 2) See section 8.4.2
- 3) See Section 8.4.3.