NCFM

NSE's CERTIFICATION IN FINANCIAL MARKETS

Securities Market (Basic) Module

NATIONAL STOCK EXCHANGE OF INDIA LIMITED

Test Details:

Sr. No.	Name of Module	Fees (Rs.)	Test Duration (in minutes)	No. of Questions	Maximum Marks	Pass Marks (%)	Certificate Validity
1	Financial Markets: A Beginners' Module *	1500	120	60	100	50	5
2	Mutual Funds : A Beginners' Module	1500	120	60	100	50	5
3	Currency Derivatives: A Beginner's Module	1500	120	60	100	50	5
4	Equity Derivatives: A Beginner's Module	1500	120	60	100	50	5
5	Interest Rate Derivatives: A Beginner's Module	1500	120	60	100	50	5
6	Commercial Banking in India: A Beginner's Module	1500	120	60	100	50	5
7	Securities Market (Basic) Module	1500	120	60	100	60	5
8	Capital Market (Dealers) Module *	1500	105	60	100	50	5
9	Derivatives Market (Dealers) Module *	1500	120	60	100	60	3
10	FIMMDA-NSE Debt Market (Basic) Module	1500	120	60	100	60	5
11	Investment Analysis and Portfolio Management Module	1500	120	60	100	60	5
12	Fundamental Analysis Module	1500	120	60	100	60	5
13	Securities Market (Advanced) Module	1500	120	60	100	60	5
14	Mutual Fund (Advanced) Module	1500	120	60	100	60	5
15	Banking Sector Module	1500	120	60	100	60	5
16	Insurance Module	1500	120	60	100	60	5
17	Macroeconomics for Financial Markets Module	1500	120	60	100	60	5
18	NISM-Series-I: Currency Derivatives Certification Examination	1000	120	100	100	60	3
19	NISM-Series-II-A: Registrars to an Issue and Share Transfer Agents – Corporate Certification Examination	1000	120	100	100	50	3
20	NISM-Series-II-B: Registrars to an Issue and Share Transfer Agents – Mutual Fund Certification Examination	1000	120	100	100	50	3
21	NISM-Series-IV: Interest Rate Derivatives Certification Examination	1000	120	100	100	60	3
22	NISM-Series-V-A: Mutual Fund Distributors Certification Examination *	1000	120	100	100	50	3
23	NISM-Series-VI: Depository Operations Certification Examination	1000	120	100	100	60	3
24	NISM Series VII: Securities Operations and Risk Management Certification Examination	1000	120	100	100	50	3
25	Certified Personal Financial Advisor (CPFA) Examination	4000	120	80	100	60	3
26	NSDL–Depository Operations Module	1500	75	60	100	60 #	5
27	Commodities Market Module	1800	120	60	100	50	3
28	Surveillance in Stock Exchanges Module	1500	120	50	100	60	5
29	Corporate Governance Module	1500	90	100	100	60	5
30	Compliance Officers (Brokers) Module	1500	120	60	100	60	5
31	Compliance Officers (Corporates) Module	1500	120	60	100	60	5
	Information Security Auditors Module (Part-1)	2250	120	90	100	60	2
32	Information Security Auditors Module (Part-2)	2250	120	90	100	60	
33	Options Trading Strategies Module	1500	120	60	100	60	5
34	FPSB India Exam 1 to 4**	2000 per exam	120	75	140	60	NA
35	Examination 5/Advanced Financial Planning **	5000	240	30	100	50	NA
36	Equity Research Module ##	1500	120	65	100	55	2
37	Issue Management Module ##	1500	120	80	100	55	2
38	Market Risk Module ##	1500	120	50	100	55	2
39	Financial Modeling Module ###	1000	150	50	75	50	NA

* Candidates have the option to take the tests in English, Gujarati or Hindi languages.

\# Candidates securing 80% or more marks in NSDL-Depository Operations Module ONLY will be certified as 'Trainers'.

** Following are the modules of Financial Planning Standards Board India (Certified Financial Planner Certification)
- FPSB India Exam 1 to 4 i.e. (i) Risk Analysis & Insurance Planning (ii) Retirement Planning & Employee Benefits (iii) Investment Planning and (iv) Tax Planning & Estate Planning
- Examination 5/Advanced Financial Planning

Modules of Finitiatives Learning India Pvt. Ltd. (FLIP)

Module of IMS Proschool

The curriculum for each of the modules (except Modules of Financial Planning Standards Board India, Finitiatives Learning India Pvt. Ltd. and IMS Proschool) is available on our website: www.nseindia.com > Education > Certifications.

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List of Abbreviations

ADB	Asian Development Bank
ADRs	American Depository Receipts
AIFIs	All India Financial Institutions
ALBM	Automated Lending and Borrowing Mechanism
ALBRS	Automated Lending and Borrowing under Rolling Settlement
AMC	Asset Management Company
AMFI	Association of Mutual Funds in India
ASC	Accounting Standards Committee
ATM	At-The-Money
ATSs	Alternative Trading system
B2B	Business-to-Business
BIFR	Board for Industrial and Financial Reconstruction
BIS	Bank for International Settlement
BLESS	Borrowing and Lending Securities Scheme
BMC	Base Minimum Capital
BSE	The Stock Exchange, Mumbai
CBDT	Central Board of Direct Taxes
CC	Clearing Corporation
CCIL	Clearing Corporation of India Limited
CDs	Certificate of Deposits
CDSL	Central Depository Services (India) Limited
CFM	Carry Forward Margin
CFRS	Carry Forward under Rolling Settlement
CH	Clearing House
CIMC	Collective Investment Management Company
CISs	Collective Investment Schemes
CIVs	Collective Investment Vehicles
CLF	Collateralised Lending Facility
CM	Clearing Member
CM Segment	Capital Market Segment of NSE
CMIE	Centre for Monitoring Indian Economy
COSI	Committee on Settlement Issues
COTI	Committee of Trade Issues
CP	Custodial Participant
CPs	Commercial Papers
CRAs	Credit Rating Agencies
CRISIL	Credit Rating Information Services of India Limited
CRR	Cash Reserve Ratio
CSD	Collateral Security Deposit
CSE	Calcutta Stock Exchange
DCA	Department of Company Affairs
DDBs	Deep Discount Bonds
DEA	Department of Economic Affairs

List of Abbreviations

DFIs	Development Financial Institutions
DNS	Deferred Net Settlement
DPs	Depository Participants
DRR	Debenture Redemption Reserve
DSCE	Debt Securities Convertible into Equity
D*v*P	Delivery *versus* Payment
ECB	Euro Commercial Borrowings
ECNS	Electronic communication Networks
EDGAR	Electronic Data Gathering, Analysis and Retrieval
EDIFAR	Electronic Data Information Filing and Retrieval
EFT	Electronic Fund Transfer
ELSS	Equity Linked Saving Schemes
EPS	Earning Per Share
ETFs	Exchange Traded Funds
F&O	Futures and Options
F&O	Futures and Options
FCCBs	Foreign Currency Convertible Bonds
FDI	Foreign Direct Investment
FDRs	Foreign Deposit Receipts
FDs	Fixed Deposits
FIBV	International World Federation of Stock Exchanges
FIIs	Foreign Institutional Investors
FIMMDA	Fixed Income Money Markets and Derivatives Association
FIs	Financial Institutions
FRAs	Forward Rate Agreements
FVCIs	Foreign Venture Capital Investors
GDP	Gross Domestic Product
GDRs	Global Deposit Receipts
GDS	Gross Domestic Savings
GNP	Gross National Product
GOI	Government of India
G-Sec	Government Securities
i-BEX	ICICI Securities Bond Index
IBRD	International Bank for Reconstruction and Development
ICAI	Institute of Chartered Accountants of India
ICDR	Issue of Capital and Disclosure Requirements
ICICI	Industrial Credit and Investment Corporation of India Limited.
ICSE	Inter-Connected Stock Exchange of India Limited
IDBI	Industrial Development Bank of India
IFC	International Finance Corporation
IFSD	Interest Free Security Deposit

List of Abbreviations

IIM	Indian Institute of Management
IISL	India Index Services and Products Limited
IOC	Immediate or Cancel
IOSCO	International Organisation of Securities Commission
IPF	Investor Protection Fund
IPO	Initial Public Offer
IRDA	Insurance Regulatory and Development Authority
IRS	Interest Rate Swap
ISIN	International Securities Identification Number
ISSA	International Securities Services Association
IT	Information Technology
ITM	In-The-Money
LAF	Liquidity Adjustment Facility
LIC	Life Insurance Corporation of India Limited
MCFS	Modified Carry Forward System
MFs	Mutual Funds
MFSS	Mutual Fund Service System
MIBID	Mumbai Inter-bank Bid Rate
MIBOR	Mumbai Inter-bank Offer Rate
MMMF	Money Market Mutual Fund
MNCs	Multi National Companies
MOU	Memorandum of Understanding
MTM	Mark-To-Market
NASDAQ	National Association of Securities Dealers Automated Quotation System
NAV	Net Asset Value
NBFCs	Non-Banking Financial Companies
NCAER	National Council for Applied Economic Research
NCDs	Non-convertible Debentures
NCDS	Non-convertible Debt Securities
NCFM	NSE's Certification in Financial Markets
NDS	Negotiated Dealing System
NEAT	National Stock Exchange Automated Trading
NGOs	Non Government Organisations
NIBIS	NSE's Internet-based Information System
NIC	National Informatics Centre
NPAs	Non Performing Assets
NRIs	Non Resident Indians
NSCCL	National Securities Clearing Corporation of India Limited
NSDL	National Securities Depository Limited
NSE	National Stock Exchange of India Limited
OCBs	Overseas Corporate Bodies
OECLOB	Open Electronic Consolidated Limit Order Book
OIS	Overnight Index Swaps

List of Abbreviations

ORS	Order Routing System
OTC	Over the Counter
OTCEI	Over the Counter Exchange of India Limited
OTM	Out-of the-Money
P/E ratio	Price Earning Ratio
PAN	Permanent Account Number
PCM	Professional Clearing Member
PDAI	Primary Dealers Association of India
PDO	Public Debt Office
PDs	Primary Dealers
PRI	Principal Return Index
PRISM	Parallel Risk Management System
PSUs	Public Sector Undertakings
PV	Present Value
QIBs	Qualified Institutional Buyers
RBI	Reserve Bank of India
ROCs	Registrar of Companies
RTGS	Real time Gross Settlement
S&P	Standard and Poor's
SAT	Securities Appellate Tribunal
SC(R)A	Securities Contracts (Regulation) Act, 1956
SC(R)R	Securities Contracts (Regulation) Rules, 1957
SCMRD	Society for Capital Market Research and Development
SDs	Satellite Dealers
SEBI	Securities and Exchange Board of India
SEC	Securities Exchange Commission
SGF	Settlement Guarantee Fund
SGL	Subsidiary General Ledger
SGX-DT	The Singapore Exchange Derivatives Trading Limited
SIPC	Securities Investor Protection Corporation
SLR	Statutory Liquidity Ratio
SPAN	Standard Portfolio Analysis of Risks
SPV	Special Purpose Vehicle
SROs	Self Regulatory Organisations
SSS	Securities Settlement System
STP	Straight Through Processing
STRIPS	Separate Trading of Registered Interest and Principal of Securities
SUS 99	Special Unit Scheme 99
T-Bills	Treasury Bills
TDS	Tax Deducted at Source
TM	Trading Member
TRI	Total Return Index
UTI	Unit Trust of India

List of Abbreviations

VaR	Value at Risk
VCFs	Venture Capital Funds
VCUs	Venture Capital Undertakings
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WAP	Wireless Application Protocol
WDM	Wholesale Debt Market Segment of NSE
YTM	Yield to Maturity
ZCYC	Zero Coupon Yield Curve

Distribution of weights in the Securities Market (Basic) Module Curriculum		
Chapter	**Title**	**Weights (%)**
1	Securities Market in India – An Overview	14
2	Primary Market	14
3	Secondary Market	24
4	Government Securities Market	10
5	Derivatives Market	24
6	Mathematics and Statistics	14

Note: Candidates are advised to refer to NSE's website: www.nseindia.com while preparing for NCFM test(s) for announcements pertaining to revisions/updations in NCFM modules or launch of new modules, if any.

CHAPTER 1: SECURITIES MARKET IN INDIA–AN OVERVIEW

1.1 INTRODUCTION

The securities markets in India have witnessed several policy initiatives, which has refined the market micro-structure, modernised operations and broadened investment choices for the investors. The irregularities in the securities transactions in the last quarter of 2000-01, hastened the introduction and implementation of several reforms. While a Joint Parliamentary Committee was constituted to go into the irregularities and manipulations in all their ramifications in all transactions relating to securities, decisions were taken to complete the process of demutualisation and corporatisation of stock exchanges to separate ownership, management and trading rights on stock exchanges and to effect legislative changes for investor protection, and to enhance the effectiveness of SEBI as the capital market regulator. Rolling settlement on T+5 basis was introduced in respect of most active 251 securities from July 2, 2001 and in respect of balance securities from 31st December 2001. Rolling settlement on T+3 basis commenced for all listed securities from April 1, 2002 and subsequently on T+2 basis from April 1, 2003.

The derivatives trading on the NSE commenced with the S&P CNX Nifty Index Futures on June 12, 2000. The trading in index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. Due to rapid changes in volatility in the securities market from time to time, there was a need felt for a measure of market volatility in the form of an index that would help the market participants. NSE launched the India VIX, a volatility index based on the S&P CNX Nifty Index Option prices. Volatility Index is a measure of market's expectation of volatility over the near term.

The Indian stock market regulator, Securities & Exchange Board of India (SEBI) allowed the direct market access (DMA) facility to investors in India on April 3, 2008. To begin with, DMA was extended to the institutional investors. In addition to the DMA facility, SEBI also decided to permit all classes of investors to short sell and the facility for securities lending and borrowing scheme was operationalised on April 21, 2008.

The Debt markets in India have also witnessed a series of reforms, beginning in the year 2001-02 which was quite eventful for debt markets in India, with implementation of several important decisions like setting up of a clearing corporation for government securities, a negotiated dealing system to facilitate transparent electronic bidding in auctions and secondary market transactions on a real time basis and dematerialisation of debt instruments. Further, there was adoption of modified Delivery-versus-Payment mode of settlement (DvP III in March 2004). The settlement system for transaction in government securities was standardized to

T+1 cycle on May 11, 2005. To provide banks and other institutions with a more advanced and more efficient trading platform, an anonymous order matching trading platform (NDS-OM) was introduced in August 2005. Short sale was permitted in G-secs in 2006 to provide an opportunity to market participants to manage their interest rate risk more effectively and to improve liquidity in the market. 'When issued' (WI) trading in Central Government Securities was introduced in 2006.

As a result of the gradual reform process undertaken over the years, the Indian G-Sec market has become increasingly broad-based and characterized by an efficient auction process, an active secondary market, electronic trading and settlement technology that ensures safe settlement with Straight through Processing (STP).

This chapter, however, takes a review of the stock market developments since 1990. These developments in the securities market, which support corporate initiatives, finance the exploitation of new ideas and facilitate management of financial risks, hold out necessary impetus for growth, development and strength of the emerging market economy of India.

1.2 PRODUCTS, PARTICIPANTS AND FUNCTIONS

Transfer of resources from those with idle resources to others who have a productive need for them is perhaps most efficiently achieved through the securities markets. Stated formally, securities markets provide channels for reallocation of savings to investments and entrepreneurship and thereby decouple these two activities. As a result, the savers and investors are not constrained by their individual abilities, but by the economy's abilities to invest and save respectively, which inevitably enhances savings and investment in the economy.

Savings are linked to investments by a variety of intermediaries through a range of complex financial products called "securities" which is defined in the Securities Contracts (Regulation) Act, 1956 to include:

(1) shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or body corporate;

(a) derivatives;

(b) units of any other instrument issued by any collective investment scheme to the investors in such schemes;

(c) security receipt as defined in clause (zg) of section 2 of the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002;

(d) units or any other such instrument issued to the investors under any mutual fund scheme;

(e) any certificate or instrument (by whatever name called), issued to an investor by any issuer being a special purpose distinct entity which possesses any debt or receivable, including mortagage debt, assigned to such entity, and acknowledging

beneficial interest of such investor in such debt or receivable, including mortgage debt, as the case may be;

(2) government securities,

(a) such other instruments as may be declared by the Central Government to be securities; and

(3) rights or interest in securities.

There are a set of economic units who demand securities in lieu of funds and others who supply securities for funds. These demand for and supply of securities and funds determine, under competitive market conditions in both goods and securities market, the prices of securities which reflect the present value of future prospects of the issuer, adjusted for risks and also prices of funds.

It is not that the users and suppliers of funds meet each other and exchange funds for securities. It is difficult to accomplish such double coincidence of wants. The amount of funds supplied by the supplier may not be the amount needed by the user. Similarly, the risk, liquidity and maturity characteristics of the securities issued by the issuer may not match preference of the supplier. In such cases, they incur substantial search costs to find each other. Search costs are minimised by the intermediaries who match and bring the suppliers and users of funds together. These intermediaries may act as agents to match the needs of users and suppliers of funds for a commission, help suppliers and users in creation and sale of securities for a fee or buy the securities issued by users and in turn, sell their own securities to suppliers to book profit. It is, thus, a misnomer that securities market disintermediates by establishing a direct relationship between the savers and the users of funds. The market does not work in a vacuum; it requires services of a large variety of intermediaries. The disintermediation in the securities market is in fact an intermediation with a difference; it is a risk-less intermediation, where the ultimate risks are borne by the savers and not the intermediaries. A large variety and number of intermediaries provide intermediation services in the Indian securities market as may be seen from Table 1.1.

Table 1.1: Market Participants in Securities Market

Market Intermediaries	**2008-09**	**2009-10**	**2010-11**
Securities Appellate Tribunal	1	1	1
Regulators*	4	4	4
Depositories	2	2	2
Stock Exchanges			
Cash Market segment	19	19	19
Debt Market segment	2	2	2
Derivative Market segment	2	2	2
Currency Derivatives segment	3	4	4
Brokers (Cash segment)	9,628	9,772	10,203
Corporate Brokers (Cash Segment)	4,079	4,194	4,774

Market Intermediaries	2008-09	2009-10	2010-11
Brokers (Derivatives)	1,587	1,705	2,111
Brokers (Currency Derivatives)	1,154	1,459	2,008
Sub-brokers (Cash Segment)	62,471	75,378	83,808
Foreign Institutional Investors	1,635	1,713	1,722
Portfolio Managers	232	243	267
Custodians	16	17	17
Registrars to an Issue & Share Transfer Agents	71	74	73
Merchant Bankers	134	164	192
Bankers to an Issue	51	48	55
Debenture Trustees	30	30	29
Underwriters	19	5	3
Venture Capital Funds	132	158	184
Foreign Venture Capital Investors	129	143	153
Mutual Funds	44	47	51
Collective Investment Schemes	1	1	1
* DCA, DEA, RBI & SEBI.			

Source: SEBI Bulletin February 2012

The securities market, thus, has essentially three categories of participants, namely the issuers of securities, investors in securities and the intermediaries. The issuers and investors are the consumers of services rendered by the intermediaries while the investors are consumers (they subscribe for and trade in securities) of securities issued by issuers. In pursuit of providing a product to meet the needs of each investor and issuer, the intermediaries churn out more and more complicated products. They educate and guide them in their dealings and bring them together. Those who receive funds in exchange for securities and those who receive securities in exchange for funds often need the reassurance that it is safe to do so. This reassurance is provided by the law and by custom, often enforced by the regulator. The regulator develops fair market practices and regulates the conduct of issuers of securities and the intermediaries so as to protect the interests of suppliers of funds. The regulator ensures a high standard of service from intermediaries and supply of quality securities and non-manipulated demand for them in the market.

1.3 SECURITIES MARKET AND FINANCIAL SYSTEM

The securities market has two interdependent and inseparable segments, the new issues (primary market) and the stock (secondary) market.

PRIMARY MARKET

The primary market provides the channel for sale of new securities. Primary market provides opportunity to issuers of securities; government as well as corporates, to raise resources to meet their requirements of investment and/or discharge some obligation.

They may issue the securities at face value, or at a discount/premium and these securities

may take a variety of forms such as equity, debt etc. They may issue the securities in domestic market and/or international market.

The primary market issuance is done either through public issues or private placement. A public issue does not limit any entity in investing while in private placement, the issuance is done to select people. In terms of the Companies Act, 1956, an issue becomes public if it results in allotment to more than 50 persons. This means an issue resulting in allotment to less than 50 persons is private placement. There are two major types of issuers who issue securities. The corporate entities issue mainly debt and equity instruments (shares, debentures, etc.), while the governments (central and state governments) issue debt securities (dated securities, treasury bills).

The price signals, which subsume all information about the issuer and his business including associated risk, generated in the secondary market, help the primary market in allocation of funds.

SECONDARY MARKET

Secondary market refers to a market where securities are traded after being initially offered to the public in the primary market and/or listed on the Stock Exchange. Majority of the trading is done in the secondary market. Secondary market comprises of equity markets and the debt markets.

The secondary market enables participants who hold securities to adjust their holdings in response to changes in their assessment of risk and return. They also sell securities for cash to meet their liquidity needs. The secondary market has further two components, namely the over-the-counter (OTC) market and the exchange-traded market. OTC is different from the market place provided by the Over The Counter Exchange of India Limited. OTC markets are essentially informal markets where trades are negotiated. Most of the trades in government securities are in the OTC market. All the spot trades where securities are traded for immediate delivery and payment take place in the OTC market. The exchanges do not provide facility for spot trades in a strict sense. Closest to spot market is the cash market where settlement takes place after some time. Trades taking place over a trading cycle, i.e. a day under rolling settlement, are settled together after a certain time (currently 2 working days). Trades executed on the National Stock Exchange of India Limited (NSE) are cleared and settled by a clearing corporation which provides novation and settlement guarantee. Nearly 100% of the trades settled by delivery are settled in demat form. NSE also provides a formal trading platform for trading of a wide range of debt securities including government securities.

A variant of secondary market is the forward market, where securities are traded for future delivery and payment. Pure forward is out side the formal market. The versions of forward in formal market are futures and options. In futures market, standardised securities are traded for future delivery and settlement. These futures can be on a basket of securities like an

index or an individual security. In case of options, securities are traded for conditional future delivery. There are two types of options–a put option permits the owner to sell a security to the writer of options at a predetermined price while a call option permits the owner to purchase a security from the writer of the option at a predetermined price. These options can also be on individual stocks or basket of stocks like index. Two exchanges, namely NSE and the Bombay Stock Exchange, (BSE) provide trading of derivatives of securities.

The past few years in many ways have been remarkable for securities market in India. It has grown exponentially as measured in terms of amount raised from the market, number of stock exchanges and other intermediaries, the number of listed stocks, market capitalisation, trading volumes and turnover on stock exchanges, and investor population. Along with this growth, the profiles of the investors, issuers and intermediaries have changed significantly. The market has witnessed fundamental institutional changes resulting in drastic reduction in transaction costs and significant improvements in efficiency, transparency and safety.

Reforms in the securities market, particularly the establishment and empowerment of SEBI, market determined allocation of resources, screen based nation-wide trading, dematerialisation and electronic transfer of securities, rolling settlement and ban on deferral products, sophisticated risk management and derivatives trading, have greatly improved the regulatory framework and efficiency of trading and settlement. Indian market is now comparable to many developed markets in terms of a number of qualitative parameters.

Stock Market Indicators:

The most commonly used indicator of stock market development is the size of the market measured by stock market capitalization (the value of listed shares on the country's exchanges) to GDP ratio. This ratio has improved significantly in India in recent years. At the end of the year 2001, the market capitalization ratio stood at 23.1 and this has significantly increased to 64.26% at the end of September 2011.

Similarly, the liquidity of the market can be gauged by the turnover ratio which equals the total value of shares traded on a country's stock exchange divided by stock market capitalization. Turnover Ratio is a widely used measure of trading activity and measures trading relative to the size of the market.

As per the Standard and Poor's Global Stock Market Fact Book 2011, India ranked 7th in terms of Market Capitalization and 10th in terms of total traded value in stock exchanges.

1.4 DERIVATIVES MARKET

Trading in derivatives of securities commenced in June 2000 with the enactment of enabling legislation in early 2000. Derivatives are formally defined to include: (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, and (b) a contract which derives its value from

the prices, or index of prices, or underlying securities. Derivatives trading in India are legal and valid only if such contracts are traded on a recognised stock exchange, thus precluding OTC derivatives.

Derivatives trading commenced in India in June 2000 after SEBI granted the approval to this effect in May 2000. SEBI permitted the derivative segment of two stock exchanges, i.e. NSE and BSE, and their clearing house/corporation to commence trading and settlement in approved derivative contracts.

To begin with, SEBI approved trading in index futures contracts based on S&P CNX Nifty Index and BSE-30 (Sensex) Index. This was followed by approval for trading in options based on these two indices and options on individual securities. The derivatives trading on the NSE commenced with S&P CNX Nifty Index futures on June 12, 2000. The trading in S&P CNX Nifty Index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. In June 2003, SEBI-RBI approved the trading on interest rate derivative instruments.

The Mini derivative Futures & Options contract on S&P CNX Nifty was introduced for trading on January 1, 2008 while the long term option contracts on S&P CNX Nifty were introduced for trading on March 3, 2008.

1.5 REGULATORY FRAMEWORK

The five main legislations governing the securities market are: (a) the SEBI Act, 1992 which established SEBI to protect investors and develop and regulate securities market; (b) the Companies Act, 1956, which sets out the code of conduct for the corporate sector in relation to issue, allotment and transfer of securities, and disclosures to be made in public issues; (c) the Securities Contracts (Regulation) Act, 1956, which provides for regulation of transactions in securities through control over stock exchanges; (d) the Depositories Act, 1996 which provides for electronic maintenance and transfer of ownership of demat securities; and (e) the Prevention of Money Laundering Act, 2002 which prevents money laundering and provides for confiscation of property derived from or involved in money laundering.

1.5.1 Legislations

Capital Issues (Control) Act, 1947: The Act had its origin during the war in 1943 when the objective was to channel resources to support the war effort. It was retained with some modifications as a means of controlling the raising of capital by companies and to ensure that national resources were channelled into proper lines, i.e. for desirable purposes to serve goals and priorities of the government, and to protect the interests of investors. Under the Act, any firm wishing to issue securities had to obtain approval from the Central Government, which also determined the amount, type and price of the issue. As a part of the liberalisation process, the Act was repealed in 1992 paving way for market determined allocation of resources.

SEBI Act, 1992: The SEBI Act, 1992 was enacted to empower SEBI with statutory powers for (a) protecting the interests of investors in securities, (b) promoting the development of the securities market, and (c) regulating the securities market. Its regulatory jurisdiction extends over corporates in the issuance of capital and transfer of securities, in addition to all intermediaries and persons associated with securities market. It can conduct enquiries, audits and inspection of all concerned and adjudicate offences under the Act. It has powers to register and regulate all market intermediaries and also to penalise them in case of violations of the provisions of the Act, Rules and Regulations made there under. SEBI has full autonomy and authority to regulate and develop an orderly securities market.

Securities Contracts (Regulation) Act, 1956: It provides for direct and indirect control of virtually all aspects of securities trading and the running of stock exchanges and aims to prevent undesirable transactions in securities. It gives Central Government regulatory jurisdiction over (a) stock exchanges through a process of recognition and continued supervision, (b) contracts in securities, and (c) listing of securities on stock exchanges. As a condition of recognition, a stock exchange complies with conditions prescribed by Central Government. Organised trading activity in securities takes place on a specified recognised stock exchange. The stock exchanges determine their own listing regulations which have to conform to the minimum listing criteria set out in the Rules.

Depositories Act, 1996: The Depositories Act, 1996 provides for the establishment of depositories in securities with the objective of ensuring free transferability of securities with speed, accuracy and security by (a) making securities of public limited companies freely transferable subject to certain exceptions; (b) dematerialising the securities in the depository mode; and (c) providing for maintenance of ownership records in a book entry form. In order to streamline the settlement process, the Act envisages transfer of ownership of securities electronically by book entry without making the securities move from person to person. The Act has made the securities of all public limited companies freely transferable, restricting the company's right to use discretion in effecting the transfer of securities, and the transfer deed and other procedural requirements under the Companies Act have been dispensed with.

Companies Act, 1956: It deals with issue, allotment and transfer of securities and various aspects relating to company management. It provides for standard of disclosure in public issues of capital, particularly in the fields of company management and projects, information about other listed companies under the same management, and management perception of risk factors. It also regulates underwriting, the use of premium and discounts on issues, rights and bonus issues, payment of interest and dividends, supply of annual report and other information.

Prevention of Money Laundering Act, 2002: The primary objective of the Act is to prevent money-laundering and to provide for confiscation of property derived from or involved in money-laundering. The term money-laundering is defined as whoever acquires, owns, possess or transfers any proceeds of crime; or knowingly enters into any transaction which is related

to proceeds of crime either directly or indirectly or conceals or aids in the concealment of the proceeds or gains of crime within India or outside India commits the offence of money-laundering. Besides providing punishment for the offence of money-laundering, the Act also provides other measures for prevention of Money Laundering. The Act also casts an obligation on the intermediaries, banking companies etc to furnish information, of such prescribed transactions to the Financial Intelligence Unit- India, to appoint a principal officer, to maintain certain records etc.

1.5.2 Rules Regulations and Regulators

The Government has framed rules under the SCRA, SEBI Act and the Depositories Act. SEBI has framed regulations under the SEBI Act and the Depositories Act for registration and regulation of all market intermediaries, and for prevention of unfair trade practices, insider trading, etc. Under these Acts, Government and SEBI issue notifications, guidelines, and circulars which need to be complied with by market participants. The SROs like stock exchanges have also laid down their rules and regulations.

The absence of conditions of perfect competition in the securities market makes the role of regulator extremely important. The regulator ensures that the market participants behave in a desired manner so that securities market continues to be a major source of finance for corporate and government and the interest of investors are protected.

The responsibility for regulating the securities market is shared by Department of Economic Affairs (DEA), Department of Company Affairs (DCA), Reserve Bank of India (RBI) and SEBI. The orders of SEBI under the securities laws are appellable before a Securities Appellate Tribunal (SAT)l.

Most of the powers under the SCRA are exercisable by DEA while a few others by SEBI. The powers of the DEA under the SCRA are also con-currently exercised by SEBI. The powers in respect of the contracts for sale and purchase of securities, gold related securities, money market securities and securities derived from these securities and ready forward contracts in debt securities are exercised concurrently by RBI. The SEBI Act and the Depositories Act are mostly administered by SEBI. The rules under the securities laws are framed by government and regulations by SEBI. All these are administered by SEBI. The powers under the Companies Act relating to issue and transfer of securities and non-payment of dividend are administered by SEBI in case of listed public companies and public companies proposing to get their securities listed. The SROs ensure compliance with their own rules as well as with the rules relevant for them under the securities laws.

1.5.3 Reforms Since 1990s

Corporate Securities Market

With the objectives of improving market efficiency, enhancing transparency, preventing unfair

trade practices and bringing the Indian market up to international standards, a package of reforms consisting of measures to liberalise, regulate and develop the securities market was introduced. The practice of allocation of resources among different competing entities as well as its terms by a central authority was discontinued. The issuers complying with the eligibility criteria were allowed freedom to issue the securities at market determined rates. The secondary market overcame the geographical barriers by moving to screen based trading. Trades enjoyed counter-party guarantee. The trading cycle shortened to a day and trades are settled within 2 working days, while all deferral products were banned. Physical security certificates almost disappeared. A variety of derivative products were permitted. The following paragraphs discuss the principal reform measures undertaken since 1992.

SEBI Act, 1992: It created a regulator (SEBI), empowered it adequately and assigned it with the responsibility for (a) protecting the interests of investors in securities, (b) promoting the development of the securities market, and (c) regulating the securities market. Its regulatory jurisdiction extends over corporates in the issuance of capital and transfer of securities, in addition to all intermediaries and persons associated with securities market. All market intermediaries are registered and regulated by SEBI. They are also required to appoint a compliance officer who is responsible for monitoring compliance with securities laws and for redressal of investor grievances. The courts have upheld the powers of SEBI to impose monetary penalties and to levy fees from market intermediaries.

Enactment of SEBI Act is the first attempt towards integrated regulation of the securities market. SEBI was given full authority and jurisdiction over the securities market under the Act, and was given concurrent/delegated powers for various provisions under the Companies Act and the SC(R)A. Many provisions in the Companies Act having a bearing on securities market are administered by SEBI. The Depositories Act, 1996 is also administered by SEBI.

SEBI Issue of Capital and Disclosure Requirements (ICDR) Regulations 2009

The SEBI (Issue of Capital and Disclosure Requirements) Regulation, 2009. are applicable for public issue; rights issue, preferential issue; an issue of bonus shares by a listed issuer; qualified institutions placement by a listed issuer and issue of Indian Depository Receipts.

The issuer should appoint one or more merchant bankers, at least one of whom should be a lead merchant banker. The issuer should also appoint other intermediaries, in consultation with the lead merchant banker, to carry out the obligations relating to the issue. The issuer should in consultation with the lead merchant banker, appoint only those intermediaries which are registered with SEBI. Where the issue is managed by more than one merchant banker, the rights, obligations and responsibilities, relating inter alia to disclosures, allotment, refund and underwriting obligations, if any, of each merchant banker should be predetermined and disclosed in the offer document. The issuer determines the price of the equity shares and convertible securities in consultation with the lead merchant banker or through the book building process. In case of debt instruments, the issuer determines the coupon rate and

conversion price of the convertible debt instruments in consultation with the lead merchant banker or through the book building process.

Screen Based Trading: The trading on stock exchanges in India used to take place through open outcry without use of information technology for immediate matching or recording of trades. This was time consuming and inefficient. This imposed limits on trading volumes and efficiency. In order to provide efficiency, liquidity and transparency, NSE introduced a nation-wide on-line fully-automated screen based trading system (SBTS) where a member can punch into the computer quantities of securities and the prices at which he likes to transact and the transaction is executed as soon as it finds a matching sale or buy order from a counter party. SBTS electronically matches orders on a strict price/time priority and hence cuts down on time, cost and risk of error, as well as on fraud resulting in improved operational efficiency. It allows faster incorporation of price sensitive information into prevailing prices, thus increasing the informational efficiency of markets. It enables market participants to see the full market on real-time, making the market transparent. It allows a large number of participants, irrespective of their geographical locations, to trade with one another simultaneously, improving the depth and liquidity of the market. It provides full anonymity by accepting orders, big or small, from members without revealing their identity, thus providing equal access to everybody. It also provides a perfect audit trail, which helps to resolve disputes by logging in the trade execution process in entirety. This diverted liquidity from other exchanges and in the very first year of its operation, NSE became the leading stock exchange in the country, impacting the fortunes of other exchanges and forcing them to adopt SBTS also. As a result, manual trading disappeared from India. Technology was used to carry the trading platform to the premises of brokers. NSE carried the trading platform further to the PCs in the residences of investors through the Internet and to hand-held devices through WAP for convenience of mobile investors. This made a huge difference in terms of equal access to investors in a geographically vast country like India.

Trading Cycle: The trades accumulated over a trading cycle and at the end of the cycle, these were clubbed together, and positions were netted out and payment of cash and delivery of securities settled the balance. This trading cycle varied from 14 days for specified securities to 30 days for others and settlement took another fortnight. Often this cycle was not adhered to. Many things could happen between entering into a trade and its performance providing incentives for either of the parties to go back on its promise. This had on several occasions led to defaults and risks in settlement. In order to reduce large open positions, the trading cycle was reduced over a period of time to a week. The exchanges, however, continued to have different weekly trading cycles, which enabled shifting of positions from one exchange to another. Rolling settlement on T+5 basis was introduced in respect of specified scrips reducing the trading cycle to one day. It was made mandatory for all exchanges to follow a uniform weekly trading cycle in respect of scrips not under rolling settlement. All scrips moved to rolling settlement from December 2001. T+5 gave way to T+3 from April 2002 and T+2 since April 2003. The market also had a variety of deferral products like modified carry forward

system, which encouraged leveraged trading by enabling postponement of settlement. The deferral products have been banned. The market has moved close to spot/cash market.

Derivatives Trading: To assist market participants to manage risks better through hedging, speculation and arbitrage, SC(R)A was amended in 1995 to lift the ban on options in securities. However, trading in derivatives did not take off, as there was no suitable legal and regulatory framework to govern these trades. Besides, it needed a lot of preparatory work- the underlying cash markets strengthened with the assistance of the automation of trading and of the settlement system; the exchanges developed adequate infrastructure and the information systems required to implement trading discipline in derivative instruments. The SC(R)A was amended further in December 1999 to expand the definition of securities to include derivatives so that the whole regulatory framework governing trading of securities could apply to trading of derivatives also. A three-decade old ban on forward trading, which had lost its relevance and was hindering introduction of derivatives trading, was withdrawn and derivatives trading took off in June 2000. The Mini derivative Futures & Options contract was introduced for trading on S&P CNX Nifty on January 1, 2008 while the long term option contracts on S&P CNX Nifty were introduced for trading on March 3, 2008.

Demutualisation: Historically, brokers owned, controlled and managed stock exchanges. In case of disputes, the self often got precedence over regulations leading inevitably to conflict of interest. The regulators, therefore, focused on reducing dominance of members in the management of stock exchanges and advised them to reconstitute their governing councils to provide for at least 50% non-broker representation. This did not materially alter the situation. In face of extreme volatility in the securities market, Government proposed in March 2001 to corporatise the stock exchanges by which ownership, management and trading membership would be segregated from one another. Government offered a variety of tax incentives to facilitate corporatisation and demutualization of stock exchanges.

NSE, however, adopted a pure demutualised governance structure where ownership, management and trading are with three different sets of people. This completely eliminated any conflict of interest and helped NSE to aggressively pursue policies and practices within a public interest (market efficiency and investor interest) framework. Currently, there are 19 demutualised stock exchanges.

Depositories Act: The earlier settlement system on Indian stock exchanges gave rise to settlement risk due to the time that elapsed before trades are settled. Trades were settled by physical movement of paper. This had two aspects. First, the settlement of trade in stock exchanges by delivery of shares by the seller and payment by the purchaser. The stock exchange aggregated trades over a period of time to carry out net settlement through the physical delivery of securities. The process of physically moving the securities from the seller to the ultimate buyer through the seller's broker and buyer's broker took time with the risk of delay somewhere along the chain. The second aspect related to transfer of shares in favour of the purchaser by the company. The system of transfer of ownership was grossly

inefficient as every transfer involved physical movement of paper securities to the issuer for registration, with the change of ownership being evidenced by an endorsement on the security certificate. In many cases the process of transfer took much longer, and a significant proportion of transactions ended up as bad delivery due to faulty compliance of paper work. Theft, forgery, mutilation of certificates and other irregularities were rampant, and in addition the issuer had the right to refuse the transfer of a security. All this added to costs, and delays in settlement, restricted liquidity and made investor grievance redressal time consuming and at times intractable.

To obviate these problems, the Depositories Act, 1996 was passed to provide for the establishment of depositories in securities with the objective of ensuring free transferability of securities with speed, accuracy and security by (a) making securities of public limited companies freely transferable subject to certain exceptions; (b) dematerialising the securities in the depository mode; and (c) providing for maintenance of ownership records in a book entry form. In order to streamline both the stages of settlement process, the Act envisages transfer of ownership of securities electronically by book entry without making the securities move from person to person. In order to promote dematerialisation, the regulator mandated trading and settlement in demat form in an ever-increasing number of securities in a phased manner. The stamp duty on transfer of demat securities was waived. Two depositories, namely, NSDL and CDSL, came up to provide instantaneous electronic transfer of securities. All actively traded scrips are held, traded and settled in demat form. Demat settlement accounts for over 99% of turnover settled by delivery. This has almost eliminated the bad deliveries and associated problems.

To prevent physical certificates from sneaking into circulation, it is mandatory for all IPOs to be compulsorily traded in dematerialised form. The admission to a depository for dematerialisation of securities has been made a prerequisite for making a public or rights issue or an offer for sale. It has also been made compulsory for public listed companies making IPO of any security for Rs.10 crore or more to do the same only in dematerialised form.

Risk Management: Market integrity is the essence of any financial market. To pre-empt market failures and protect investors, the regulator/exchanges have developed a comprehensive risk management system, which is constantly monitored and upgraded. It encompasses capital adequacy of members, adequate margin requirements, limits on exposure and turnover, indemnity insurance, on-line position monitoring and automatic disablement, etc. They also administer an efficient market surveillance system to curb excessive volatility, detect and prevent price manipulations. Exchanges have set up trade/settlement guarantee funds for meeting shortages arising out of non-fulfillment/partial fulfillment of funds obligations by the members in a settlement. As a part of the risk management system, the index based market wide circuit breakers have also been put in place.

The anonymous electronic order book ushered in by the NSE did not permit members to assess credit risk of the counter-party necessitated some innovation in this area. To effectively address

this issue, NSE introduced the concept of a novation, and set up the first clearing corporation, *viz*. National Securities Clearing Corporation Ltd. (NSCCL), which commenced operations in April 1996. The NSCCL assures the counterparty risk of each member and guarantees financial settlement. Counterparty risk is guaranteed through a fine tuned risk management system and an innovative method of on-line position monitoring and automatic disablement. NSCCL established a Settlement Guarantee Fund (SGF). The SGF provides a cushion for any residual risk and operates like a self-insurance mechanism wherein the members contribute to the fund. In the event of failure of a trading member to meet his obligations, the fund is utilized to the extent required for successful completion of the settlement. This has eliminated counter-party risk of trading on the Exchange. The market has now full confidence that settlements will take place in time and will be completed irrespective of default by isolated trading members. In fact such confidence is driving volumes on exchanges.

Traditionally, brokerage firms in India have been proprietary or partnership concerns with unlimited liabilities. This restricted the amount of capital that such firms can raise. The growing volume of transactions made it imperative for such firms to be well capitalised and professional. The necessary legal changes were effected to open up the membership of stock exchanges to corporates with limited liability, so that brokerage firms may be able to raise capital and retain earnings. In order to boost the process of corporatisation, capital gains tax payable on the difference between the cost of the individual's initial acquisition of membership and the market value of that membership on the date of transfer to the corporate entity was waived. In response, many brokerage firms reorganised themselves into corporate entities.

Investor Protection: The SEBI Act established SEBI with the primary objective of protecting the interests of investors in securities and empowers it to achieve this objective. SEBI specifies the matters to be disclosed and the standards of disclosure required for the protection of investors in respect of issues and issues directions to all intermediaries and other persons associated with the securities market in the interest of investors or of orderly development of the securities market. The Central Government established a fund called Investor Education and Protection Fund (IEPF) in October 2001 for the promotion of awareness amongst investors and protection of the interest of investors. The Government issued the following guidelines for the purpose of financial assistance from IEPF:

(a) Any organisation/entity/person with a viable project proposal on investors' education and protection would be eligible for assistance from the fund.

(b) The entity should be registered under the Societies Registration Act or formed as Trusts or incorporated Companies; should be in existence for a minimum period of 2 years prior to its date of application for registration for assistance; should have a minimum of 20 members and a proven record of 2 years; and should have rules, regulations and or by-laws for its governance and management.

(c) No profit making entity shall be eligible for financial assistance from the fund.

(d) Notwithstanding the above, the Committee on IEPF can give a project to any organisation.

(e) While considering proposals, the IEPF Committee takes into account the audited accounts and the annual reports of the last three years of the entity seeking assistance from IEPF.

(f) The limit for each entity for assistance would be subject to 5% of the budget of IEPF during that financial year and not exceeding 80%[1] of the amount to be spent on the proposed programme/activity.

DEA, DCA, SEBI and exchanges have set up investor grievance cells for redressal of investor grievance. The exchanges maintain investor protection funds to take care of investor claims, which may arise out of non-settlement of obligations by a trading member for trades executed on the exchange. DCA has also set up an investor education and protection fund for the promotion of investors' awareness and protection of interest of investors. All these agencies and investor associations are organising investor education and awareness programmes.

Globalisation: Indian securities market is getting increasingly integrated with the rest of the world. Indian companies have been permitted to raise resources from abroad through issue of ADRs, GDRs, FCCBs and ECBs. ADRs/GDRs have two-way fungibility. Indian companies are permitted to list their securities on foreign stock exchanges by sponsoring ADR/GDR issues against block shareholding. NRIs and OCBS are allowed to invest in Indian companies. FIIs have been permitted to invest in all types of securities, including government securities. The investments by FIIs enjoy full capital account convertibility. They can invest in a company under portfolio investment route upto 24% of the paid up capital of the company. This can be increased up to the sectoral cap/statutory ceiling, as applicable, provided this has the approval of the Indian company's board of directors and also its general body. Indian Stock Exchanges have been permitted to set up trading terminals abroad. The trading platform of Indian exchanges is now accessed through the Internet from anywhere in the world. Mutual Funds have been permitted to set up off-shore funds to invest in equities of other countries. They can also invest in ADRs/GDRs of Indian companies.

Mini Nifty and long dated options: The year 2008 witnessed the launch of new products in the F&O Segment. The mini derivative (futures and options) contracts on S&P CNX Nifty were introduced for trading on January 1, 2008. The mini contracts are a fraction of normal derivative contracts and extend greater affordability to individual investors, helps the individual investor to hedge risks of a smaller portfolio, offers low levels of risk in terms of smaller level of possible downside compared to a big size contract and also increases overall market liquidity and participation. The Long Term Options Contracts on NSEs S&P CNX Nifty were launched on March 3, 2008. The long-term options are similar to short-term options, but the later expiration dates offer the opportunity for long-term investors to take a view on prolonged price changes

[1] Sourced from http://www.iepf.gov.in/Reg_Fin.

without needing to use a combination of shorter term option contracts. The premiums for long term options tend to be higher than that of short term option because the increased expiration period means increased possibility of larger movement in the price of the underlying.

Short Selling*:* Pursuant to the recommendations of the Secondary Market Advisory Committee (SMAC) of SEBI and the decision of the SEBI Board, it was decided to permit all classes of investors to short sell.

Short selling is defined as selling a stock which the seller does not own at the time of trade. It increases liquidity in the market, and makes price discovery more efficient. Besides, it curbs manipulation of stocks as informed investors are able to go short on stocks they feel are higher than fair value. This facility was available to non-institutional investors. Vide a circular in February 2008, SEBI permitted all classes of investors, viz., retail and institutional investors to short sell. It, however, does not permit naked short sales and accordingly, requires participants to mandatorily honour their obligation of delivering the securities at the time of settlement. It does not permit institutional investor to do day trading i.e., square-off their transactions intra-day. In other words, all transactions are be grossed for institutional investors at the custodians' level and the institutions are required to fulfill their obligations on a gross basis. The custodians, however, continue to settle their deliveries on a net basis with the stock exchanges. It has put in a scheme for Securities Lending and Borrowing to provide the necessary impetus to short sell. The facility of short sales is made available in respect of securities traded in derivatives segment of exchanges.

Securities Lending and Borrowing: SEBI issued a SLB scheme on December 20, 2007. The salient features of the scheme are as under:

- All Clearing members of NSCCL including Banks and Custodians referred to as 'Participant' are registered as Approved Intermediaries (AIs) under the SLS, 1997.
- The SLB would take place on an automated, screen based, order-matching platform which will be provided by the AIs. This platform would be independent of the other trading platforms.
- Currently, securities available for trading in F&O segment of National Stock Exchange of India Ltd. (NSEIL) would be eligible for lending & borrowing under the scheme. Securities lending and borrowing is permitted in dematerialized form only
- All categories of investors including retail, institutional etc. will be permitted to borrow and lend securities. The borrowers and lenders would access the platform for lending/ borrowing set up by the AIs through the clearing members (CMs) who are authorized by the AIs in this regard.
- The tenure of lending/borrowing would be fixed as standardised contracts. Accordingly the return of securities by borrower is scheduled on the respective reverse leg settlement day. Each reverse leg settlement date is assigned a specific series number. The tenure of lending and borrowing ranges from 1 month up to a maximum period of 12 months.

- The first leg of the transactions across all series including early recall/repayment transactions are settled on T+1 day on a gross basis.. The settlement of lending and borrowing transactions would be independent of normal market settlement.
- The settlement of the lending and borrowing transactions should be done on a gross basis at the level of the clients i.e. no netting of transactions at any level will be permitted.

NSCCL, as an Approved Intermediary (AI) launched the Securities Lending & Borrowing Scheme from April 21, 2008. Lending & Borrowing is carried on an automated screen based platform where the order matching is done on basis of price time priority.

Direct Market Acess: During April 2008, Securities & Exchange Board of India (SEBI) allowed the direct market access (DMA) facility to the institutional investors. DMA allows brokers to offer clients direct access to the exchange trading system through the broker's infrastructure without manual intervention by the broker. DMA facility give clients direct control over orders, help in faster execution of orders, reduce the risk of errors from manual order entry and lend greater transparency and liquidity. DMA also leads to lower impact cost for large orders, better audit trails and better use of hedging and arbitrage opportunities through the use of decision support tools/algorithms for trading.

Volatility Index: With rapid changes in volatility in securities market from time to time, a need was felt for an openly available and quoted measure of market volatility in the form of an index to help market participants. On January 15, 2008, Securities and Exchange Board of India recommended Exchange to construct and disseminate the volatility index. Volatility Index is a measure, of the amount by which an underlying Index is expected to fluctuate, in the near term, (calculated as annualised volatility, denoted in percentage e.g. 20%) based on the order book of the underlying index options. On April 08, 2008, NSE launched the Volatility Index, India VIX, based on the Nifty 50 Index Option prices. From the best bid-ask prices of Nifty 50 Options contracts, a volatility figure (%) is calculated which indicates the expected market volatility over the next 30 calendar days. The India VIX is a simple but useful tool in determining the overall volatility of the market

Cross Margining: Many trading members undertake transactions on both the cash and derivative segments of an Exchange. They keep separate deposits with the exchange for taking positions in two different segments. In order to improve the efficiency of the use of the margin capital by market participants and as in initial step towards cross margining across cash and derivatives markets SEBI allowed Cross Margining benefit in May 2008.

For Cross margining the stock positions of the institutions in capital market segment after confirmation by the custodian on T+1 day shall be compared with the stock futures position of the same institution in derivative segment based on the CP code of the institution at the end of the day. The position shall be considered for cross margining only if the position in the capital market segment off set the position in the derivative segment.

SEBI has allowed the following to start with: a. Cross margin is available for institutional trades. b. Cross margin is available to positions in cash market having corresponding off-setting positions in the stock futures market. c. For positions in the cash market which have corresponding offsetting positions in the stock futures, VaR margin is not be levied on the cash market position to the extent of the off-setting stock futures market position. d. Extreme Loss margin and Market to Market margin shall continue to be levied on the entire cash market position. e. The near-month stock futures positions are not considered for cross-margin benefit three days prior to expiry (the last Thursday of every month) and there will be no change in the margins on the F & O positions.

In December 2008, SEBI extended the cross margin facility across Cash and F&O segment and to all the market participants. The salient features of the cross margining are as under :

1. Cross margin is available across Cash and F&O segment and to all categories of market participants.
2. The positions of clients in both the Cash and F&O segments to the extent they offset each other shall be considered for the purpose of cross margining as per the following priority.
    a. Index futures and constituent stock futures in F&O segment.
    b. Index futures and constituent stock positions in Cash segment.
    c. Stock futures in F&O segment and stock positions in Cash segment
3. In order to extend the cross margin benefit as per 2 (a) and (b) above, the basket of constituent stock futures/ stock positions shall be a complete replica of the index futures
4. The positions in F&O segment for stock futures and index futures shall be in the same expiry month to be eligible for cross margin benefit.
5. Positions in option contracts shall not be considered for cross margining benefit.
6. The Computation of cross margin shall be at client level on an on-line real time basis.
7. For institutional investors the positions in Cash segment shall be considered only after confirmation by the custodian on T+1 basis and on confirmation by the clearing member in F&O segment.
8. The positions in the Cash and F&O segment shall be considered for cross margining only till time the margins are levied on such positions.
9. The positions which are eligible for offset, shall be subject to spread margins. The spread margins shall be 25% of the applicable upfront margins on the offsetting positions.

Government Securities Market

The government securities market has witnessed significant transformation in the 1990s. With giving up of the responsibility of allocating resources from securities market, government stopped expropriating seigniorage and started borrowing at near-market rates. Government securities are now sold at market related coupon rates through a system of auctions instead of earlier practice of issue of securities at very low rates just to reduce the cost of borrowing of the government. Major reforms initiated in the primary market for government securities include auction system (uniform price and multiple price method) for primary issuance of T-bills and central government dated securities, a system of primary dealers and non-competitive bids to widen investor base and promote retail participation, issuance of securities across maturities to develop a yield curve from short to long end and provide benchmarks for rest of the debt market, innovative instruments like, zero coupon bonds, floating rate bonds, bonds with embedded derivatives, availability of full range (91-day, 182 day and 364-day) of T-bills, etc. The reforms in the secondary market include Delivery versus Payment system for settling scripless SGL transactions to reduce settlement risks, SGL Account II with RBI to enable financial intermediaries to open custody (Constituent SGL) accounts and facilitate retail transactions in scripless mode, enforcement of a trade-for-trade regime, settlement period of T+1 for all transactions undertaken directly between SGL participants and for transactions routed through NSE brokers, routing transactions through brokers of NSE, OTCEI and BSE, repos in all government securities with settlement through SGL, liquidity support to PDs to enable them to support primary market and undertake market making, special fund facility for security settlement, etc. Other measures include abolition of TDS on government securities and stamp duty on transfer of demat debt securities.

Market Infrastructure: As part of the ongoing efforts to build debt market infrastructure, two new systems, the Negotiated Dealing System (NDS) and the Clearing Corporation of India Limited (CCIL) commenced operations on February 15, 2002. NDS, interalia, facilitates screen based negotiated dealing for secondary market transactions in government securities and money market instruments, online reporting of transactions in the instruments available on the NDS and dissemination of trade information to the market. Government Securities (including T-bills), call money, notice/term money, repos in eligible securities, Commercial Papers and Certificate of Deposits are available for negotiated dealing through NDS among the members. The CCIL facilitates settlement of transactions in government securities (both outright and repo) on Delivery versus Payment (DVP-II) basis which provides for settlement of securities on gross basis and settlement of funds on net basis simultaneously. It acts as a central counterparty for clearing and settlement of government securities transactions done on NDS.

Further, there was adoption of modified Delivery-versus-Payment mode of settlement (DvP III in March 2004). The settlement system for transaction in government securities was standardized to T+1 cycle on May 11, 2005. To provide banks and other institutions with a more advanced and more efficient trading platform, an anonymous order matching trading platform (NDS-OM) was introduced in August 2005. Short sale was permitted in G-secs in

2006 to provide an opportunity to market participants to manage their interest rate risk more effectively and to improve liquidity in the market. 'When issued' (WI) trading in Central Government Securities was introduced in 2006.

As a result of the gradual reform process undertaken over the years, the Indian G-Sec market has become increasingly broad-based and characterized by an efficient auction process, an active secondary market, electronic trading and settlement technology that ensures safe settlement with Straight through Processing (STP).

Research in Securities Market

In order to deepen the understanding and knowledge about Indian capital market, and to assist in policy-making, SEBI has been promoting high quality research in capital market. It has set up an in-house research department, which brings out working papers on a regular basis. In collaboration with NCAER, SEBI brought out a 'Survey of Indian Investors', which estimates investor population in India and their investment preferences. SEBI has also tied up with reputed national and international academic and research institutions for conducting research studies/projects on various issues related to the capital market. In order to improve market efficiency further and to set international benchmarks in the securities industry, NSE supports a scheme called the NSE Research Initiative with a view to develop an information base and a better insight into the working of securities market in India. The objective of this initiative is to foster research, which can support and facilitate (a) stock exchanges to better design market micro-structure, (b) participants to frame their strategies in the market place, (c) regulators to frame regulations, (d) policy makers to formulate policies, and (e) expand the horizon of knowledge. The Initiative has received tremendous response.

Testing and Certification

The intermediaries, of all shapes and sizes, who package and sell securities, compete with one another for the chance to handle investors/issuers' money. The quality of their services determines the shape and health of the securities market. In developed markets and in some of the developing markets, this is ensured through a system of testing and certification of persons joining market intermediaries in the securities market. This sort of arrangement ensures that a person dealing with financial products has a minimum standard of knowledge about them, market and regulations so as to assist the customers in their dealings. This allows market participants and intermediaries to build their own tailored staff development strategies and improves career prospectus of certified professionals, while maintaining and enhancing the confidence of the investors in the market.

A testing and certification mechanism that has become extremely popular and is sought after by the candidates as well as employers is unique on-line testing and certification programme called National Stock Exchange's Certification in Financial Markets (NCFM). It is an on-line fully automated nation-wide testing and certification system where the entire process from generation of question paper, testing, assessing, scores reporting and certifying is fully automated - there is absolutely no scope for human intervention. It allows tremendous

flexibility in terms of testing centres, dates and timing and provides easy accessibility and convenience to candidates as he can be tested at any time and from any location. It tests practical knowledge and skills, that are required to operate in financial markets, in a very secure and unbiased manner, and certifies personnel who have a proper understanding of the market and business and skills to service different constituents of the market.

The above reforms have come in stages. As some deficiency is noted or some malpractice surfaces in the working of the market, the authorities initiate further reforms and corrective steps. As such, the process of reform in the securities market is far from complete. At the same time the reforms undertaken so far have aimed to improve operational and informational efficiency in the market by enabling the participants to carry out transactions in a cost effective manner and providing them with full, relevant and accurate information in time. A number of checks and balances have been built up to protect investors, enhance their confidence and avoid systemic failure of the market. Stability of the system as a whole has been protected by allowing for contestability of the market and imposing entry criteria for issuers and intermediaries. Financial integrity of the market is ensured by prudential controls on intermediaries.

1.6 ROLE OF NSE IN INDIAN SECURITIES MARKET

National Stock Exchange of India Limited (NSE) was given recognition as a stock exchange in April 1993. NSE was set up with the objectives of (a) establishing a nationwide trading facility for all types of securities, (b) ensuring equal access to all investors all over the country through an appropriate communication network, (c) providing a fair, efficient and transparent securities market using electronic trading system, (d) enabling shorter settlement cycles and book entry settlements, and (e) meeting the international benchmarks and standards. Within a short span of life, above objectives have been realized and the Exchange has played a leading role as a change agent in transforming the Indian Capital Markets to its present form.

NSE has set up infrastructure that serves as a role model for the securities industry in terms of trading systems, clearing and settlement practices and procedures. The standards set by NSE in terms of market practices, products, technology and service standards have become industry benchmarks and are being replicated by other market participants. It provides screen-based automated trading system with a high degree of transparency and equal access to investors irrespective of geographical location. The high level of information dissemination through on-line system has helped in integrating retail investors on a nation-wide basis. The Exchange currently operates three market segments, namely Capital Market Segment, Wholesale Debt Market Segment and Futures an Options segment. NSE has been playing the role of a catalytic agent in reforming the market in terms of microstructure and market practices. Right from its inception, the exchange has adopted the purest form of demutualised set up whereby the ownership, management and trading rights are in the hands of three different sets of people. This has completely eliminated any conflict of interest and helped NSE to aggressively pursue policies and practices within a public interest framework. It has helped in shifting the trading platform from the trading hall in the premises of the exchange to the computer terminals at the premises of the trading members located country-wide and subsequently to the personal

computers in the homes of investors and even to hand held portable devices for the mobile investors. Settlement risks have been eliminated with NSE's innovative endeavors in the area of clearing and settlement viz., reduction of settlement cycle, professionalisation of the trading members, fine-tuned risk management system, dematerialisation and electronic transfer of securities and establishment of clearing corporation. As a consequence, the market today uses the state-of-art information technology to provide an efficient and transparent trading, clearing and settlement mechanism.

NSE provides a trading platform for of all types of securities-equity and debt, corporate and government and derivatives. On its recognition as a stock exchange under the Securities Contracts (Regulation) Act, 1956 in April 1993, it commenced operations in the Wholesale Debt Market (WDM) segment in June 1994, in the Capital Market (CM) segment in November 1994, and in Futures & Options (F&O) segment in June 2000. The Exchange started providing trading in retail debt of Government Securities in January 2003.

The ***Wholesale Debt Market*** segment provides the trading platform for trading of a wide range of debt securities. Its product, which is now disseminated jointly with FIMMDA, the *FIMMDA NSE MIBID/MIBOR* is used as a benchmark rate for majority of deals struck for Interest Rate Swaps, Forwards Rate Agreements, Floating Rate Debentures and Term Deposits in the country. Its 'Zero Coupon Yield Curve' as well as NSE-VaR for Fixed Income Securities have also become very popular for valuation of sovereign securities across all maturities irrespective of its liquidity and facilitated the pricing of corporate papers and GOI Bond Index.

NSEs ***Capital Market*** segment offers a fully automated screen based trading system, known as the National Exchange for Automated Trading (NEAT) system, which operates on a strict price/time priority. It enables members from across the country to trade simultaneously with enormous ease and efficiency. Its *Futures & Options* segment provides trading of a wide range of derivatives like Index Futures, Index Options, Stock Options and Stock Futures.

NSEs **Futures & Options** segment provides trading of a wide range of derivatives like Index Futures, Index Options, Stock Options and Stock Futures.

NSEs **Currency Derivatives** segment provides trading on currency futures contracts on the US $-INR which commenced on August 29, 2008. In February 2009, trading on additional pairs such as GBP-INR, EUR-INR and JPY-INR was allowed while trading in US $-INR currency options were allowed for trading on October 29, 2010. The interest rate futures trade on the currency derivatives segment of NSE and they were allowed for trading segment on August 31, 2009

Technology and Application Systems in NSEIL

NSE is the first exchange in the world to use satellite communication technology for trading. Its trading system, called National Exchange for Automated Trading (NEAT), is a state of-the-art client server based application. At the server end all trading information is stored in an in-memory database to achieve minimum response time and maximum system availability for users. It has uptime record of 99.7%. The system also ensures data integrity with past record of a single error in 10 million bits. NSE has been continuously undertaking capacity

enhancement measures so as to effectively meet the requirements of increased users and associated trading loads. NSE has also put in place NIBIS (NSE's Internet Based Information System) for on-line real-time dissemination of trading information over the Internet.

As part of its business continuity plan, NSE has established a disaster back-up site at Chennai along with its entire infrastructure, including the satellite earth station and the high-speed optical fibre link with its main site at Mumbai. This site at Chennai is a replica of the production environment at Mumbai. The transaction data is backed up on near real time basis from the main site to the disaster back-up site through the high-speed optical fibre to keep both the sites all the time synchronised with each other.

NSEIL is a technology driven exchange and since its inception it has been harnessing technology to provide the best possible and efficient service to all market participants and stake holders. The various application systems that it uses for trading as well clearing and settlement and other operations are the backbone of the Exchange. The application systems used for the day-to-day functioning of the Exchange can be divided into (a) Front end applications and (b) Back office applications.

In the front end, there are 6 applications:

(a) **NEAT – CM system** takes care of trading of securities in the Capital Market segment that includes equities, debentures/notes as well as retail Gilts. The NEAT – CM application has a split architecture wherein the split is on the securities and users. The application runs on three Stratus systems with Open Strata Link (OSL). This application also provides data feed for processing to some other systems like Index, OPMS through TCP/IP. This is a direct interface with the Trading members of the CM segment of the Exchange for entering the orders into the main system. There is a two way communication between the NSE main system and the front end terminal of the Trading Member.

(b) **NEAT – WDM system** takes care of trading of securities in the Wholesale Debt Market (WDM) segment that includes Gilts, Corporate Bonds, CPs, T-Bills, etc. This is a direct interface with the Trading members of the WDM segment of the Exchange for entering the orders/trades into the main system. There is a two way communication between the NSE main system and the front end terminal of the Trading Member.

(c) **NEAT – F&O system** takes care of trading of securities in the Futures and Options (F&O) segment that includes Futures on Index as well as individual stock and Options on Index as well as individual stocks. This is a direct interface with the Trading members of the F&O segment of the Exchange for entering the orders into the main system. There is a two way communication between the NSE main system and the front end terminal of the Trading Member.

(d) **NEAT – IPO system** is an interface to help the initial public offering of companies which are issuing the stocks to raise capital from the market. This is a direct interface with the Trading members of the CM segment who are registered for undertaking

order entry on behalf of their clients for IPOs. NSE uses the NEAT IPO system that allows bidding in several issues concurrently. There is a two way communication between the NSE main system and the front end terminal of the Trading Member.

(e) **NEAT – MF system** is an interface with the Trading members of the CM segment for order collection of designated Mutual Funds units.

(f) **NEAT- CD system** is trading system for currency derivatives. Currently, currency futures are trading in the segment.

(g) **Surveillance system** offers the users a facility to comprehensively monitor the trading activity and analyse the trade data online and offline.

In the back office, the following important application systems are operative:

(i) **NCSS (Nationwide Clearing and Settlement System)** is the clearing and settlement system of the NSCCL for the trades executed in the CM segment of the Exchange. The system has 3 important interfaces –

a) *OLTL (Online Trade loading)* that takes each and every trade executed on real time basis and allocates the same to the clearing members,

b) *Depository Interface* that connects the depositories for settlement of securities and Clearing Bank Interface that connects the 13 clearing banks for settlement of funds. It also interfaces with the clearing members for all required reports.

c) Through *collateral management system* it keeps an account of all available collaterals on behalf of all trading/clearing members and integrates the same with the position monitoring of the trading/clearing members. The system also generates base capital adequacy reports.

(ii) **FOCASS** is the clearing and settlement system of the NSCCL for the trades executed in the F&O segment of the Exchange. It interfaces with the clearing members for all required reports. Through collateral management system it keeps an account of all available collaterals on behalf of all trading/clearing members and integrates the same with the position monitoring of the trading/clearing members. The system also generates base capital adequacy reports.

(iii) **OPMS** – the online position monitoring system that keeps track of all trades executed for a trading member vis-à-vis its capital adequacy.

(iv) **PRISM** is the parallel risk management system for F&O trades using Standard Portfolio Analysis (SPAN). It is a system for comprehensive monitoring and load balancing of an array of parallel processors that provides complete fault tolerance. It provides real time information on initial margin value, mark to market profit or loss, collateral amounts, contract-wise latest prices, contract-wise open interest and limits.

(v) **Data warehousing** that is the central repository of all data in CM as well as F&O segment of the Exchange,

(vi) **Listing system** that captures the data from the companies which are listed in the Exchange for corporate governance and integrates the same to the trading system for necessary broadcasts for data dissemination process and

(vii) **Membership system** that keeps track of all required details of the Trading Members of the Exchange.

MODEL QUESTIONS

Ques:1 Which one of the following is not among the major legislations governing the securities market?

(a) Capital Issues Act, 1947 (b) SEBI Act, 1992

(c) Companies Act 1956 (d) Depositories Act 1996

Correct Answer: (a)

Ques:2 Which of the following is not the main objective of SEBI?

(a) Protecting the interest of investors in securities market

(b) Protecting & development of forex market in India

(c) Promoting the development of securities market

(d) Regulating the securities market

Correct answer: (b)

Ques:3 All market intermediaries are registered and regulated by _____.

(a) DCA (b) SEBI

(c) MOF (d) RBI

Correct answer: (b)

Ques:4 The _____ issued by SEBI aim to secure fuller disclosure of the relevant information about the issuer and the nature of issue so that the investors can take informed decision.

(a) Disclosure & Investor Protection Guidelines

(b) SCRA

(c) SEBI (Stock Brokers and Sub brokers) Rule

(d) SEBI (Prohibition of Fraudulent and Unfair Trade Practices Relating to Securities Markets) regulations

Correct answer: (a)

Ques:5 NSE's screen based trading system (SBTS) matches orders in the _____ priority basis.

(a) time/price (b) price/time

(c) price/quantity (d) quantity/price

Correct answer: (b)

Ques:6 The current trading cycle practiced by the exchanges is

(a) T+5 (b) T+3

(c) T+2 (d) T+1

Correct answer: (c)

Ques:7 Following problems have been eliminated by introduction of Depositories act?

(a) Stamp duty on transfer of shares in dematerialized form

(b) reduction in the share transfer time to the buyer

(c) higher liquidity

(d) All of the above

Correct answer: (d)

Ques:8 For the promotion of awareness among the investors and the protection of the interest of the investors the central government has established

(a) investor education and protection fund

(b) investors grievance redressal cell

(c) settlement guarantee fund

(d) all of the above

Correct Answer: (a)

CHAPTER 2: PRIMARY MARKET

2.1 INTRODUCTION

Primary market provides opportunity to issuers of securities, Government as well as corporates, to raise resources to meet their requirements of investment and/or discharge some obligation. The issuers create and issue fresh securities in exchange of funds through public issues and/or as private placement. They may issue the securities at face value, or at a discount/ premium and these securities may take a variety of forms such as equity, debt or some hybrid instrument. They may issue the securities in domestic market and/or international market through ADR/GDR/ECB route.

2.2 MARKET DESIGN

The market design for primary market is provided in the provision of the Companies Act, 1956, which deals with issues, listing and allotment of securities. In addition, ICDR guidelines of SEBI prescribe a series of disclosures norms to be complied by issuer, promoter, management, project, risk factors and eligibility norms for accessing the market. In this section, the market design as provided in securities laws has been discussed.

2.2.1 SEBI Issue of Capital and Disclosure Requirements (ICDR) Regulations 2009[2]

The issue of capital in India is governed by the SEBI (Issue of Capital and Disclosure Requirements) Regulation, 2009[3]. ICDR regulations are applicable for public issue; rights issue[4], preferential issue; an issue of bonus shares by a listed issuer; qualified institutions placement by a listed issuer and issue of Indian Depository Receipts.

General conditions for public issues and rights issues

An issuer cannot make a public issue or rights issue of equity shares and convertible securities[5] under the following conditions:

a. If the issuer, any of its promoters, promoter group or directors or persons in control of the issuer are debarred from accessing the capital market by SEBI or

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2 Only some provisions pertaining to ICDR Regulations 2009 are discussed here. For greater details, it is recommended that original regulation may be referred to. The regulations are updated as of December 31, 2010.

3 The ICDR Regulations 2009 have been made primarily by conversion of the SEBI (Disclosure and Investor Protection) Guidelines, 2000 (rescinded). ICDR were notified on August 26, 2009.While incorporating the provisions of the rescinded Guidelines into the ICDR Regulations, certain changes have been made by removing the redundant provisions, modifying certain provisions on account of changes necessitated due to market design and bringing more clarity to the provisions of the rescinded Guidelines. (sourced from SEBI circular (SEBI/CFD/DIL/ICDRR/1/2009/03/09) dated September 3, 2009)

4 where the aggregate value of specified securities offered is Rs.50 lakh or more;

5 Convertible security means a security which is convertible into or exchangeable with equity shares at a later date with or without the option of the holder of the security and includes convertible debt instrument and convertible preference shares.

b. If any of the promoters, director or person in control of the issuer was or also is a promoter, director or person in control of any other company which is debarred from accessing the capital market under the order or directions made by SEBI.

c. If the issuer of convertible debt instruments[6] is in the list of willful defaulters published by the RBI or it is in default of payment of interest or repayment of principal amount in respect of debt instruments issued by it to the public, if any, for a period of more than 6 months.

d. Unless an application is made to one or more recognised stock exchanges for listing of equity shares and convertible securities on such stock exchanges and has chosen one of them as a designated stock exchange. However, in case of an initial public offer, the issuer should make an application for listing of the equity shares and convertible securities in at least one recognised stock exchange having nationwide trading terminals.

e. Unless it has entered into an agreement with a depository for dematerialisation of equity shares and convertible securities already issued or proposed to be issued.

f. Unless all existing partly paid-up equity shares of the issuer have either been fully paid up or forfeited.

g. Unless firm arrangements of finance through verifiable means towards 75% of the stated means of finance, excluding the amount to be raised through the proposed public issue or rights issue or through existing identifiable internal accruals, have been made.

Appointment of Merchant banker and other intermediaries

The issuer should appoint one or more merchant bankers, at least one of whom should be a lead merchant banker. The issuer should also appoint other intermediaries, in consultation with the lead merchant banker, to carry out the obligations relating to the issue. The issuer should in consultation with the lead merchant banker, appoint only those intermediaries which are registered with SEBI. Where the issue is managed by more than one merchant banker, the rights, obligations and responsibilities, relating *inter alia* to disclosures, allotment, refund and underwriting obligations, if any, of each merchant banker should be predetermined and disclosed in the offer document.

Conditions for Initial Public Offer

1) An issuer may make an initial public offer (an offer of equity shares and convertible debentures by an unlisted issuer to the public for subscription and includes an offer for sale of specified securities to the public by an existing holder of such securities in an unlisted issuer) if:

[6] means an instrument which creates or acknowledges indebtedness and is convertible into equity shares of the issuer at a later date at or without the option of the holder of the instrument, whether constituting a charge on the assets of the issuer or not

a. The issuer has net tangible assets of at least Rs.3 crores in each of the preceding 3 years (of 12 months each) of which not more than 50% are held in monetary assets. If more than 50% of the net tangible assets are held in monetary assets, then the issuer has to make firm commitment to utilize such excess monetary assets in its business or project.

b. The issuer has a track of distributable profits[7] in at least 3 out of the immediately preceding 5 years[8].

c. The issuer company have a net worth of at least Rs.1 crores in each of the preceding 3 full years (of 12 months each).

d. The aggregate of the proposed issue and all previous issues made in the same financial year in terms of issue size does not exceed 5 times its pre-issue net worth as per the audited balance sheet of the preceding financial year.

e. In case of change of name by the issuer company within last one year, at least 50% of the revenue for the preceding one year should have been earned by the company from the activity indicated by the new name.

2) Any issuer not satisfying any of the conditions stipulated above may make an initial public offer if:

a. The issue is made through the book building process and the issuer undertakes to allot at least 50% of the net offer to public to qualified institutional buyers and to refund full subscription monies if it fails to make allotment to the qualified institutional buyers **OR** At least 15% of the cost of project is contributed by scheduled commercial banks or public financial institutions, of which not less than 10% would come from the appraisers and the issuer undertakes to allot at least 10% of the net offer to public to qualified institutional buyers and to refund full subscription monies if it fails to make the allotment to the qualified institutional buyers.

b. The minimum post-issue face value capital of the issuer should be Rs.10 crore; **OR** the issuer undertakes to provide compulsory market making for at least 2 years from the date of listing of the equity shares and convertible securities subject to the conditions that a) the Market makers undertake to offer buy and sell quotes for a minimum depth of 300 equity shares and convertible securities and ensure that the bid-ask spread for their quotes should not at any time exceed 10 % b) the inventory of the market makers, as on the date of allotment of the equity shares and convertible securities should be at least 5% of the proposed issue.

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[7] Distributable profits have to be in terms of section 205 of the Companies Act 1956.

[8] Provided that extraordinary items shall not be considered for calculating distributable profits

3) An issuer may make an initial public offer of convertible debt instruments without making a prior public issue of its equity shares and listing.

4) An issuer cannot make an allotment pursuant to a public issue if the number of prospective allottees is less than one thousand.

5) No issuer can make an initial public offer if there are any outstanding convertible securities or any other right which would entitle any person any option to receive equity shares after the initial public offer. However, this is not applicable to:

- a public issue made during the currency of convertible debt instruments which were issued through an earlier initial public offer, if the conversion price of such convertible debt instruments was determined and disclosed in the prospectus of the earlier issue of convertible debt instruments;
- outstanding options granted to employees pursuant to an employee stock option scheme framed in accordance with the relevant Guidance Note or Accounting Standards, if any, issued by the Institute of Chartered Accountants of India in this regard.
- Fully paid-up outstanding securities which are required to be converted on or before the date of filing of the red herring prospectus (in case of book built issues) or the prospectus (in case of fixed price issues), as the case may be.

Conditions for further public offer

An issuer may make a further public offer (an offer of equity shares and convertible securities) if it satisfies the following conditions:

a) the aggregate of the proposed issue and all previous issues made in the same financial year in terms of issue size does not exceed 5 times its pre-issue net worth as per the audited balance sheet of the preceding financial year;

(b) if it has changed its name within the last one year, at least 50% of the revenue for the preceding one full year has been earned by it from the activity indicated by the new name.

If the issuer does not satisfy the above conditions, it may make a further public offer if it satisfies the following conditions:

(i) the issue is made through the book building process and the issuer undertakes to allot at least 50% of the net offer to public to qualified institutional buyers and to refund full subscription monies if it fails to make allotment to the qualified institutional buyers ;or at least 15% of the cost of the project is contributed by scheduled commercial banks or public financial institutions, of which not less than 10% should come from the appraisers and the issuer undertakes to allot at least 10% of the net offer to

public to qualified institutional buyers and to refund full subscription monies if it fails to make the allotment to the qualified institutional buyers;

(ii) the minimum post-issue face value capital of the issuer is Rs.10 crore; or the issuer undertakes to provide market-making for at least 2 years from the date of listing of the specified securities, subject to the two conditions that a) the market makers offer buy and sell quotes for a minimum depth of three hundred specified securities and ensure that the bid-ask spread for their quotes does not, at any time, exceed 10%;

b) the inventory of the market makers, as on the date of allotment of the specified securities, should be at least 5% of the proposed issue.

Pricing in Public Issues

The issuer determines the price of the equity shares and convertible securities[9] in consultation with the lead merchant banker or through the book building process. In case of debt instruments, the issuer determines the coupon rate and conversion price of the convertible debt instruments in consultation with the lead merchant banker or through the book building process.

Differential Pricing

An issuer may offer equity shares and convertible securities at different prices; subject to the following condition;

(a) the retail individual investors/shareholders or employees entitled for reservation[10] making an application for equity shares and convertible securities of value not more than Rs.2 lakh, may be offered equity shares and convertible securities at a price lower than the price at which net offer is made to other categories of applicants provided that such difference is not more than 10% of the price at which equity shares and convertible securities are offered to other categories of applicants;

(b) in case of a book built issue, the price of the equity shares and convertible securities offered to an anchor investor[11] cannot be lower than the price offered to other applicants;

(c) in case of a composite issue[12], the price of the equity shares and convertible securities offered in the public issue may be different from the price offered in rights issue and justification for such price difference should be given in the offer document.

(d) in case the issuer opts for the alternate method of book building, the issuer may offer specified securities to its employees at a price lower than the floor price. However, the

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9 convertible security" means a security which is convertible into or exchangeable with equity shares of the issuer at a later date, with or without the option of the holder of the security and includes convertible debt instrument and convertible preference shares.

10 Made under regulation 42 pertaining to Reservation on competitive basis.

11 Anchor investor" means a qualified institutional buyer who makes an application for a value of Rs.10 crores or more in a public issue through the book building process in accordance with the ICDR regulations 2009.

12 " Composite issue" means an issue of equity shares and convertible securities by a listed issuer on public cum-rights basis, wherein the allotment in both public issue and rights issue is proposed to be made simultaneously.

difference between the floor price and the price at which equity shares and convertible securities are offered to employees should not be more than 10% of the floor price.

Promoters' Contribution

The promoters' minimum contribution varies from case to case. The promoters of the issuer are required to contribute in the public issue as follows:

In case of an **initial public offer**, the minimum contribution should not be less than 20% of the post issue capital;

In case of **further public offer**, it should be either to the extent of 20 % of the proposed issue size or to the extent of 20% of the post-issue capital;

In case of a **composite issue**, either to the extent of 20% of the proposed issue size or to the extent of 20% of the post-issue capital excluding the rights issue component.

Lock-in of specified securities held by promoters.

In a public issue, the equity shares and convertible debentures held by promoters are locked-in for the period stipulated below:

(a) minimum promoters' contribution is locked-in for a period of 3 years from the date of commencement[13] of commercial production or date of allotment in the public issue, whichever is later;

(b) promoters' holding in excess of minimum promoters' contribution is locked-in for a period of 1 year:

However, excess promoters' contribution in a further public offer[14] are not subject to lock in.

Book Building

Book Building means a process undertaken to elicit demand and to assess the price for determination of the quantum or value of specified securities or Indian Depository Receipts, as the case may be in accordance with the SEBI ICDR Regulations 2009.

In an issue made through the book building process, the allocation in the net offer to public category is made as follows

i) Not less than 35 % to retail individual investors.

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13 "date of commencement of commercial production" means the last date of the month in which commercial production in a manufacturing company is expected to commence as stated in the offer document.

14 where the equity shares of the same class which are proposed to be allotted pursuant to conversion or exchange of convertible securities offered through the offer or are proposed to be allotted in the offer have been listed and are not infrequently traded in a recognised stock exchange for a period of at least three years and the issuer has a track record of dividend payment for at least immediately preceding three years.Provided that where promoters propose to subscribe to the specified securities offered to the extent greater than higher of the two options available in clause (b) of sub-regulation (1) of regulation 32, the subscription in excess of such percentage shall be made at a price determined in terms of the provisions of regulation 76 or the issue price, whichever is higher.shall not be subject to lock-in.

ii) Not less than 15 % to non institutional investors i.e. investors other than retail individual investors and qualified institutional buyers.

iii) Not more than 50% to Qualified Institutional Buyers; 5 % of which would be allocated to mutual funds[15].

However, if the issue is made through the book building process and the issuer undertakes to allot at least 50% of the net offer to public to qualified institutional buyers and to refund full subscription monies if it fails to make allotment to the qualified institutional buyers **then** in that case at least 50% of the net offer to public should be allotted to qualified institutional buyers.

In an issue made through the book building process, the issuer may allocate upto 30% of the portion available for allocation to qualified institutional buyers to an anchor investor in accordance with the conditions laid down in ICDR Regulations 2009[16].

In an issue made other than through the book building process, allocation in the net offer to public category will be made as follows:

(a) minimum 50% to retail individual investors; and

(b) remaining to individual applicants other than retail individual investors and) other investors including corporate bodies or institutions, irrespective of the number of equity shares and convertible securities applied for;

(c) the unsubscribed portion in either of the categories specified above (point a and b) may be allocated to applicants in the other category.

If the retail individual investor category is entitled to more than 50% on proportionate basis, the retail individual investors will be allocated that higher percentage.

Indian Depository Receipts

A foreign company can access Indian securities market for raising funds through issue of Indian Depository Receipts (IDRs).

An IDR is an instrument denominated in Indian Rupees in the form of a depository receipt created by a Domestic Depository (custodian of securities registered with the

Securities and Exchange Board of India) against the underlying equity of issuing company to enable foreign companies to raise funds from the Indian securities markets.[17]

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15 In addition to the 5% allocation, mutual funds are eligible for allocation under the balance available for qualified institutional buyers.

16 Conditions laid down in the Schedule XI of ICDR regulations.

17 Sourced from SEBI FAQ on Primary issuance

An issuing company making an issue of IDR is required to satisfy the following:

(a) it should be listed in its home country[18].

(b) it should not be prohibited to issue securities by any regulatory body.

(c) it should have a track record of compliance with securities market regulations in its home country.

Conditions for issue of IDR.

An issue of IDR is subject to the following conditions:

(a) issue size should not be less than Rs.50 crore.

(b) procedure to be followed by each class of applicant for applying should be mentioned in the prospectus;

(c) minimum application amount should be Rs.20,000;

(d) at least 50 %. of the IDR issued should be allotted to qualified institutional buyers on proportionate basis.

(e) the balance 50 % may be allocated among the categories of non-institutional investors and retail individual investors including employees[19] at the discretion of the issuer and the manner of allocation has to be disclosed in the prospectus. Allotment to investors within a category will be on proportionate basis.

Further, atleast 30% of the IDRs issued will be allocated to retail individual investors and in case of under-subscription in retail individual investor category, spill over to other categories to the extent of under-subscription may be permitted.

(f) At any given time, there will be only one denomination of IDR of the issuing company.

2.2.2 Merchant Banking

The merchant banking activity in India is governed by SEBI (Merchant Bankers) Regulations, 1992. All merchant bankers have to be registered with SEBI. The person applying for certificate of registration as merchant banker has to be a body corporate other than a non-banking financial company, has necessary infrastructure, and has at least two persons in his employment with experience to conduct the business of the merchant banker. The applicant has to fulfill the capital adequacy requirements, with prescribed minimum net worth. The

[18] Home country means the country where the issuing company is incorporated and listed.

[19] "employee" means a resident of India, and is a permanent and full-time employee or a director, whether whole time or part time, of the issuer or of the holding company or subsidiary company or of the material associate(s) of the issuer, whose financial statements are consolidated with the issuer's financial statements, working in India and does not include promoters and an immediate relative of the promoter (i.e., any spouse of that person, or any parent, brother, sister or child of the person or of the spouse

regulations specify the code of conduct to be followed by merchant bankers, responsibilities of lead managers, payments of fees and disclosures to SEBI. They are required to appoint a Compliance Officer, who monitors compliance requirements of the securities laws and is responsible for redressal of investor grievance.

2.2.3 Credit Rating

Credit rating is governed by the SEBI (Credit Rating Agencies) Regulations, 1999. The Regulations cover rating of securities only and not rating of fixed deposits, foreign exchange, country ratings, real estates etc. CRAs can be promoted by public financial institutions, scheduled commercial banks, foreign banks operating in India with the approval of RBI, foreign credit rating agencies recognised in the country of their incorporation, having at least five years experience in rating, or any company or a body corporate having continuous net worth of minimum Rs.100 crore for the previous five years. CRAs would be required to have a minimum net worth of Rs. 5 crore. No Chairman, Director or Employee of the promoters shall be Chairman, Director or Employee of CRA or its rating committee. A CRA can not rate (i) a security issued by its promoter, (ii) securities issued by any borrower, subsidiary, an associate promoter of CRA, if there are common Chairman, Directors and Employees between the CRA or its rating committee and these entities (iii) a security issued by its associate or subsidiary if the CRA or its rating committee has a Chairman, Director or Employee who is also a Chairman, Director or Employee of any such entity.

For all public and rights issues of debt securities, an obligation has been cast on the issuer to disclose in the offer documents all the ratings it has got during the previous 3 years for any of its listed securities. CRAs would have to carry out periodic reviews of the ratings given during the lifetime of the rated instrument.

2.2.4 Demat Issues

As per SEBI mandate, all new IPOs are compulsorily traded in dematerialised form. The admission to a depository for dematerialisation of securities is a prerequisite for making a public or rights issue or an offer for sale. The investors would however, have the option of either subscribing to securities in physical form or dematerialised form. The Companies Act, 1956 requires that every public listed company making IPO of any security for Rs.10 crore or more shall issue the same only in dematerialised form.

2.2.5 Private Placement

The private placement involves issue of securities, debt or equity, to a limited number of subscribers, such as banks, FIs, MFs and high net worth individuals. It is arranged through a merchant/investment banker, who acts as an agent of the issuer and brings together the issuer and the investor(s). On the presumption that these are allotted to a few sophisticated and experienced investors and the public at large does not have much stake in it, the securities

offered in a private placement are exempt from the public disclosure regulations and registration requirements of the regulatory body. What distinguishes private placement from public issues is while the latter invite application from as many subscribers, the subscriptions in the private placement are normally restricted to a limited number. In terms of the Companies Act, 1956, offer of securities to more than 50 persons is deemed to be public issue.

2.2.6 Virtual Debt Portal

The private placement of debt as well as transactions in debt securities are generally effected through opaque negotiations. The result is inefficient price discovery, fragmented market, low liquidity, poor disclosures and ineffective audit trails. B2B portal, namely *debtonnetindia* provides a secure, anonymous, neutral and flexible transactional platform for issue and trading of fixed income instruments.

The *debtonnetindia* is a B2B web-enabled market place for primary issuance of debt securities and provides investors and brokers similar levels of efficiency and transparency on the primary market segment as exchange system provides for secondary market in debt.

2.2.7 ADRs/GDRs

Indian companies are permitted to raise foreign currency resources through two main sources:(a) issue of Foreign Currency Convertible Bonds (FCCBs) –more commonly known as 'Euro Issues' and (b) issue of ordinary equity shares through depository receipts, namely, Global Depository Receipts (GDRs)/American Depository Receipts (ADRs) to foreign investors i.e. institutional investors or individuals (including NRIs) residing abroad. A depository receipt (DR) is any negotiable instrument in the form of a certificate denominated in US dollars. The certificates are issued by an overseas depository bank against certain underlying stock/shares. The shares are deposited by the issuing company with the depository bank. The depository bank in turn tenders DRs to the investors. A DR represents a particular bunch of shares on which the receipt holder has the right to receive dividend, other payments and benefits which company announces from time to time for the share holders. However, it is non-voting equity holding. DRs facilitate cross border trading and settlement, minimize transactions costs and broaden the potential base, especially among institutional investors.

An American Depository Receipt (ADR) is a negotiable U.S. certificate representing ownership of shares in a non-U.S. corporation. ADRs are quoted and traded in U.S. dollars in the U.S. securities market. Also, the dividends are paid to investor in U.S. dollars. ADRs were specifically designed to facilitate the purchase, holding and sale of non-U.S. securities by U.S. investor, and to provide a corporate finance vehicle for non-U.S. companies. Any non-U.S. company seeking to raise capital in the U.S. or increase their base of U.S. investor can issue ADRs. Advantages of ADRs are:

- ADRs allow you to diversify your portfolio with foreign securities easily.

- ADRs trade, clear and settle in accordance with U.S. market regulations and permit prompt dividend payments and corporate action notification.
- If an ADR is exchange-listed, investor also benefits from readily available price and trading information.

Global Depository Receipts (GDRs) may be defined as a global finance vehicle that allows an issuer to raise capital simultaneously in two or more markets through a global offering. GDRs may be used in either the public or private markets inside or outside the US. GDR, a negotiable certificate usually represents a company's publicly traded equity or debt.

ADRs and GDRs are identical from a legal, operational, technical and administrative standpoint. The word 'global' denotes receipts issued are on a global basis that is to investors not restricted to US.

The FCCBs/GDRs/ADRs issued by Indian companies to non-residents have free convertibility outside India. In India, GDRs/ADRs are reckoned as part of foreign direct investment and hence need to conform to the existing FDI policy. Resource mobilisation by Indian corporates through Euro issues by way of FCCBs, GDRs and ADRs has been significant in the 1990s. As per current guidelines, the proceeds of ADRs/GDRs/FCCBs cannot be used on investment in real estate and stock markets. This prohibition not only puts restriction on Indian bidders in the first stage offer to the Government, but also to fund second stage of mandatory public offer under SEBI Takeover Code. In order to promote the disinvestment programme, it has been decided that ADR/GDR/FCCB proceeds could be used in the first stage acquisition of shares in the disinvestment process and also in the mandatory second stage offer to the public, in view of their strategic importance. It has been clarified by SEBI that the scheme of two-way fungibility of ADR/GDR issues will be only operated for foreign investors other than OCBs.

As regards transfer of shares (on conversion of GDRs/ADRs into shares) in favour of residents, the non-resident holder of GDRs/ADRs should approach the Overseas Depository bank with a request to the Domestic Custodian bank to get the corresponding underlying shares released in favour of the non-resident investor for being sold by the non-resident or for being transferred in the books of the issuing company in the name of the non-resident. In order to improve liquidity in ADR/GDR market and eliminate arbitrage, RBI issued guidelines in February 2002 to permit two-way fungibility for ADRs/GDRs which means that investors (foreign institutional or domestic) in any company that has issued ADRs/GDRs can freely convert the ADRs/GDRs into underlying domestic shares. They can also reconvert the domestic shares into ADRs/ GDRs, depending on the direction of price change in the stock.

MODEL QUESTIONS

Ques:1 A company making a public issue of securities has to file a draft prospectus with SEBI at least _____ prior to the filing of prospectus with the Registrar of Companies.

(a) 21 days (b) 30 days

(c) one month (d) 15 days

Correct Answer: (b)

Ques:2. In the case of a public issue through 100% book building route what is the minimum percentage of shares that can be allocated to the retail investors applying for Rs.1000 worth shares for subscription?

(a) 20% (b) 25%

(c) 35% (d) 45%

Correct Answer: (c)

Ques:3 At the time of public issue each company enters into a memorandum of understanding with its_____

(a) Auditors (b) Directors

(c) Merchant Bankers (d) SEBI

Correct Answer: (c)

Ques:4. In terms of Companies Act 1956, offer of securities to more than _____ persons is deemed to be public issue.

(a) 50 (b) 40

(c) 100 (d) 75

Correct Answer: (a)

Ques:5 A holder of an ADR/GDR does not have right to _____.

(a) vote

(b) receive dividend

(c) receive corporate action notification

(d) trade the ADRs/GDRs in the stock market

Correct Answer: (a)

Ques:6 Which of the following is not true of a credit rating agency (CRA)?

(a) CRA has to have a minimum net worth of 5 crore

(b) CRA cannot rate the securities issued by its promoter

(c) CRA cannot rate the securities issued by any borrower, subsidiary, an associate promoter of CRA if there are common Chairman, Directors or employee between CRA or its rating committee and these entities.

(d) CRA can be promoted by any company or body corporate having the net worth of 100 crore in previous 3 years.

Correct Answer: (d)

CHAPTER 3: SECONDARY MARKET

3.1 INTRODUCTION

Secondary market is the place for sale and purchase of existing securities. It enables an investor to adjust his holdings of securities in response to changes in his assessment about risk and return. It also enables him to sell securities for cash to meet his liquidity needs. It essentially comprises of the stock exchanges which provide platform for trading of securities and a host of intermediaries who assist in trading of securities and clearing and settlement of trades. The securities are traded, cleared and settled as per prescribed regulatory framework under the supervision of the Exchanges and SEBI.

3.2 MARKET DESIGN

3.2.1 Stock Exchanges

The stock exchanges are the exclusive centres for trading of securities. Listing of companies on a Stock Exchange is mandatory to provide an opportunity to investors to invest in the securities of local companies. The trading volumes on exchanges have been witnessing phenomenal growth for last few years. Since the advent of screen based trading system in 1994-95, it has been growing by leaps and bounds and reported a total turnover of Rs.46,85,034 crore during 2010-11. The growth of turnover has, however, not been uniform across exchanges as may be seen from Table 3.1. The increase in turnover took place mostly at big exchanges(NSE and BSE) and it was partly at the cost of small exchanges that failed to keep pace with the changes. The business moved away from small exchanges to big exchanges, which adopted technologically superior trading and settlement systems. The huge liquidity and order depth of big exchanges further diverted liquidity of other stock exchanges. The small exchanges put together reported less than 0.06% of total turnover during 2010-11, while 2 big exchanges accounted for over 99.94 % of turnover. For most of the exchanges, the raison d'être for their existence, i.e. turnover, has disappeared. NSE and BSE are the major exchanges having nationwide operations. NSE operated through 2,100 VSATs in 174 cities at the end of March 2011.

(Table: 3.1): Turnover on NSE vs. Turnover on other Exchanges

(in Rs. crore)

Exchange	2008-09	2009-10	2010-11
NSE	27,52,023	41,38,023	35,77,410
BSE	11,00,074	13,78,809	11,05,027
UPSE	89	25	0.12
Ahmedabad	0	0	0

Exchange	2008-09	2009-10	2010-11
Calcutta	393	1,612	2,597
Madras	0	0	0
OTCEI	0	0	0
Delhi	0	0	0
Bangalore	0	0	0
ISE	0	0	0
Bhubaneshwar	0	0	0
Cochin	0	0	0
Coimbatore	0	0	0
Gauhati	0	0	0
Jaipur	0	0	0
Ludhiana	0	0	0
MPSE	0	0	0
Pune	0	0	0
Vadodara	0	0	0
Total	**38,52,579**	**55,18,469**	**46,85,034**
NSE+BSE	**38,52,097**	**55,16,832**	**46,82,437**
Total (Except NSE + BSE)	**482**	**1,637**	**2,597**

Source: SEBI Annual Report 2010-11

Corporatisation & Demutualisation of Stock Exchanges:

'Corporatisation' means the succession of a recognized stock exchange, being a body of individuals or a society registered under the Societies Registration Act 1860 (21 of 1860) by another stock exchange, being a company incorporated for the purpose of assisting, regulating or controlling the business of buying, selling or dealing in securities carried on by such individuals or society.

'Demutualisation' means the segregation of ownership and management from the trading rights of the members of a recognized stock exchange in accordance with the scheme approved by the Securities and Exchange Board of India.

Demutualization is the process through which a member-owned company becomes shareholder-owned company. Worldwide, stock exchanges have offered striking example of the trend towards demutualization, as the London Stock Exchange (LSE), New York Stock Exchange (NYSE), Toronto Stock Exchange (TSE) and most other exchanges across the globe have moved towards demutualization and India is no exception to it.

In January 2002, SEBI directed all the recognised stock exchanges to suitably amend their Rules, Articles etc. within a period of two months from the date of the order to provide that

no broker member of the stock exchanges shall be an office bearer of an exchange, i.e. hold the position of President, Vice President, Treasurer etc. This was done to give effect to the decision taken by SEBI and the policy decision of Government in regard to demutualisation/ corporatisation of exchanges by which ownership, management and trading membership would be segregated from each other.

Corporatisation and demutualisation of stock exchanges are complex subjects and involve a number of legal, accounting, Companies Act related and tax issues. Therefore, SEBI set up in March 2002 a Group on 'Corporatisation & Demutualisation of Stock Exchanges' under the Chairmanship of Shri M. H. Kania, former Chief Justice of India. The Group submitted its report in August 2002 with the following recommendations:

(a) A common model for corporatisation and demutualisation may be adopted for all stock exchanges. Each stock exchange would be required to submit a scheme drawn on the lines of the recommendations of the Group to SEBI for approval. Any stock exchange failing to comply with the requirement of corporatisation and demutualisation by the appointed date may be derecognised.

(b) The SCRA may be amended to provide that a stock exchange should be a company incorporated under the Companies Act. The stock exchanges set up as association of persons or as companies limited by guarantee may be converted into companies limited by shares.

(c) The Income Tax Act may be amended to provide that the accumulated reserves of the stock exchange as on the day of corporatisation are not taxed. The reserves may be taxed in the hands of the shareholders when these are distributed to shareholders as dividend at the net applicable tax rate. All future profits of the stock exchange after it becomes a for-profit company may be taxed. Further, the issue of ownership rights (shares) and trading rights in lieu of the card should not be regarded as transfer and not attract capital gains tax. However, at the point of sale of any of these two rights, capital gains tax would be attracted.

(d) The Indian Stamp Act and the Sales Tax laws may be amended to exempt from stamp duty and sales tax, the transfer of the assets from the mutual stock exchange and the issuance of shares by the new demutualised for-profit company.

(e) While the Group favours the deposit system for trading rights, it likes to leave the choice of adopting either the card or the deposit system to the exchanges. If the deposit system is accepted, the value of the card will be segregated into two independent rights namely the right to share in the net assets and goodwill of the stock exchange and the right to trade on the stock exchange.

(f) The three stakeholders viz. shareholders, brokers and investing public through the regulatory body should be equally represented on the governing board of the demutualised exchange. The roles and hence the posts of the Chairman and Chief Executive should be segregated. The Chairman should be a person who has considerable knowledge and experience of the functioning of the stock exchanges

and the capital market. The Chairman of the Board should not be a practicing broker. The exchange must appoint a CEO who would be solely responsible for the day to day functioning of the exchange, including compliance with various regulations and risk management practices. The board should not constitute any committee which would dilute the independence of the CEO.

(g) The demutualised stock exchanges should follow the relevant norms of corporate governance applicable to listed companies in particular, the constitution of the audit committee, standards of financial disclosure and accounting standards, disclosures in the annual reports, disclosures to shareholders and management systems and procedures. It would be desirable for the demutualised exchanges to list its shares on itself or on any other exchange. However, this may not be made mandatory; in case the exchange is listed the monitoring of its listing conditions should be left to the Central Listing Authority or SEBI.

(h) No specific form of dispersal need be prescribed but there should be a time limit prescribed, say three years which can be extended by a further maximum period of 2 years with the approval of SEBI, within which at least 51% of the shares would be held by non-trading members of the stock exchange. There should be a ceiling of 5% of the voting rights, which can be exercised by a single entity, or groups of related entities, irrespective of the size of ownership of the shares.

Thereafter, various activities associated with the C&D were completed by the stock exchanges within time specified in the respective approved schemes. During the year 2007, SEBI approved and notified the corporatisation and Demutualisation Schemes of 19 stock exchanges, under Section 4B(8) of the Securities Contracts (Regulation) Act, 1956.

Stock Exchanges Subsidiary

SEBI required with effect from February 28, 2003 that the small stock exchanges which are permitted to promote/float a subsidiary/company to carry out the following changes in management structure of their subsidiaries and to ensure the compliance:

1. The subsidiary company should appoint a CEO who should not hold any position concurrently in the stock exchange (parent exchange). The appointment, the terms and conditions of service, the renewal of appointment and the termination of service of CEO should be subject to prior approval of SEBI.

2. The governing board of the subsidiary company should have the following composition *viz.*, (a) the CEO of the subsidiary company should be a director on the Board of subsidiary and the CEO should not be a sub-broker of the subsidiary company or a broker of the parent exchange (b) at least 50% of directors representing on the Governing Board of subsidiary company should not be sub-brokers of the subsidiary company or brokers of the promoter/holding exchange and these directors should be called the Public Representatives (c) the public representatives should be nominated by the parent exchange (subject to prior approval of SEBI) (d) public representatives

should hold office for a period of one year from the date of assumption of the office or till the Annual General Meeting of subsidiary company whichever is earlier (e) there should be a gap of at least one year after a consecutive period of three years before re-nomination of any person for the post of non-member director (f) the parent exchange should appoint a maximum of two directors who are officers of the parent exchange.

3. The subsidiary company should have its own staff none of whom should be concurrently working for or holding any position of office in the parent exchange.

4. The parent exchange should be responsible for all risk management of the subsidiary company and shall set up appropriate mechanism for the supervision of the trading activity of subsidiary company.

3.2.2 Membership in NSE

There are no entry/exit barriers to the membership of NSE. Anybody can become a member by complying with the prescribed eligibility criteria and exit by surrendering membership without any hidden cost.

The members are admitted to different segments of the Exchange subject to the provisions of the Securities Contracts (Regulation) Act, 1956, the SEBI Act, 1992, the rules, circulars, notifications, guidelines, etc. issued hereunder and the byelaws, rules and regulations of the Exchange. The trading members of NSE have certain benefits, which includes:

(a) Access to a nation - wide trading facility for equities, derivatives, debt and hybrid instruments / products;

(b) Ability to provide a fair, efficient and transparent securities market to the investors;

(c) Use of state-of-the-art electronic trading systems and technology;

(d) Dealing with an organisation which follows strict standards for trading & settlement at par with those available at the top international bourses and constantly strives to move towards a global marketplace in the securities industry.

New Membership

The persons eligible to become trading members of Exchange are:

(a) Individuals;

(b) Partnership firms registered under the Indian Partnership Act, 1932.

(c) Institutions, including subsidiaries of banks engaged in financial services;

(d) Banks for Currency Derivatives Segment;

(e) Body corporates including companies as defined in the Companies Act, 1956. A company is eligible to be admitted as a member if:

i) It is formed in compliance with provisions of Section 12 of the Companies Act 1956 which mentions about the mode of forming incorporated company;

ii) It complies with the financial requirements and norms as may be specified by SEBI;

iii) The directors of the company shouldn't have been disqualified for being members of a stock exchange and should not have held the offices of the directors in any company which had been a member of the stock exchange and had been declared defaulter or expelled by the stock exchange; and

(f) Such other persons or entities as may be permitted from time to time by RBI/SEBI under the Securities Contracts (Regulations) Rules, 1957.

Membership for Different Segments at NSE

Persons or Institutions desirous of securing admission as members (stock brokers) on the Exchange may apply for membership on any one of the following segment groups:

(a) Wholesale Debt Market (WDM) Segment

(b) Capital Market (CM) segment

(c) Capital Market (CM) and Wholesale Debt Market (WDM) segment

(d) Capital Market (CM) and Futures & Options (F&O) segment

(e) Capital Market (CM), Futures & Options (F&O) segment and Wholesale Debt Market (WDM) segment

(f) Currency Derivatives (CD) segment with or without the above mentioned segments.

(g) Clearing Membership of National Securities Clearing Corporation Ltd. (NSCCL) as a Professional Clearing Member (PCM). Professional Clearing Members do not trade but only clear and settle trades executed by other trading members (TMs). Professional clearing membership is only applicable for the F&O and CD segments.

In addition to the trading membership in the F&O segment, the trading member can also take two types of clearing membership in the F&O Segment i.e. as a clearing member and self clearing member. The self clearing members clear and settle the trades executed by them only, either on their account or on account of their clients. Trading members cum clearing members can clear and settle their own trades as well as trades of other trading members.

Trading members registered in F&O segment and CD segment are eligible to trade in interest rate futures market.

Eligibility Criteria for Membership:

The eligibility criteria and deposits/fees payable for trading membership are summarised in Table 3.2. An applicant for membership must possess the minimum stipulated networth. The networth for the purpose should be calculated as stipulated by the Exchange/SEBI. In case

the company is a member of any other Stock Exchange(s), it should satisfy the combined minimum networth requirements of all these Stock Exchanges including NSEIL. The minimum paid up capital of a corporate applicant for trading membership should be Rs. 30 lakh.

Table 3.2: Eligibilty Criteria for Membership

(Amount in Rs. Lakh)

Particulars/ Segments	**CM**	**CM and F&O**	**WDM**	**CM and WDM**	**CM,WDM and F&O**
Minimum Paid-up capital	30	30	30	30	30
Net Worth	100	100 (Membership in CM segment and Trading/Trading and self clearing membership in F&O segment) 300 (Membership in CM segment and Trading and Clearing membership in F&O segment)	200	200	200 (Membership in WDM segment, CM segment and Trading/Trading and Self Clearing membership in F&O segment) 300 (Membership in WDM segment, CM segment and Trading and Clearing membership in F&O segment)
Interest Free Security Deposit with NSEIL	85	110	150	235	260
Interest Free Security Deposit with NSCCL	15	15 *	NIL	15	15 *
Collateral Security Deposit with NSCCL	25	25**	NIL	25	25**
Annual Subscription	1	1	1	2	2
Advance Minimum Transaction Charges for Futures Segment	NIL	1	NIL	NIL	1

Particulars/ Segments	CM	CM and F&O	WDM	CM and WDM	CM,WDM and F&O
Education	Two directors should be HSC. Dealers should also have passed SEBI approved certification test for Capital Market Module of NCFM.	Two directors should be HSC. Dealers should also have passed SEBI approved certification test for Derivatives and Capital Market Module of NCFM.	Two directors should be HSC. Dealers should also have passed FIMMDA-NSE Debt Market (Basic Module) of NCFM.	Two directors should be HSC. Dealers should also have passed FIMMDA-NSE Debt Market (Basic Module) of NCFM & Capital Market Module of NCFM.	Two directors should be HSC. Dealers should also have passed FIMMDA-NSE Debt Market (Basic Module) of NCFM, Capital Market Module of NCFM.& SEBI approved certification test for Derivatives
Experience	----------Two year's experience in securities market----------				
Track Record	The Directors should not be defaulters on any stock exchange. They must not be debarred by SEBI for being associated with capital market as intermediaries. They must be engaged solely in the business of securities and must not be engaged in any fund-based activity.				

Net worth requirement for Professional Clearing members in F&O segment is Rs. 300 lakhs. Further, a Professional Clearing member needs to bring IFSD of 25 lakhs with NSCCL and Collateral Security Deposit (CSD) of 25 lakh with NSCCL as deposits.

* *Additional IFSD of 25 lakhs with NSCCL is required for Trading and Clearing members (TM-CM) and for Trading and Self clearing members (TM/SCM).*

** *Additional Collateral Security Deposit (CSD) of 25 lakhs with NSCCL is required for Trading and Clearingmembers (TM-CM) and for Trading and Self clearing members (TM/SCM). In addition, a member clearing for others is required to bring in IFSD of Rs. 2 lakh and CSD of Rs. 8 lakh per trading member he undertakes to clear in the F&O segment.*

Table 3.3: Eligibility Criteria for Membership- Individuals/ Partnership Firms

(Amount in Rs. lakh)

Particulars	CM	CM and F&O	WDM	CM and WDM	CM,WDM and F&O
Net Worth	75	75 (Membership in CM segment and Trading membership in F&O segment) 100 (Membership in CM segment and Trading and Self clearing membership in the F&O segment) 300 (Membership in CM segment and Trading and Clearing membership in F&O segment)	200	200	200 (Membership in WDM segment, CM segment and Trading/ Trading and Self Clearing membership in F&O segment) 300 (Membership in WDM segment,CM segment and Trading and clearing membership on F&O segment)
Interest Free Security Deposit (IFSD) with NSEIL	26.5	51.5	150	176.5	201.5
Interest Free Security Deposit (IFSD) with NSCCL	6	6 *	NIL	6	6*
Collateral Security Deposit (CSD) with NSCCL	17.5	17.5 **	NIL	17.5	17.5 **

Particulars	CM	CM and F&O	WDM	CM and WDM	CM,WDM and F&O
Annual Subscription	0.5	0.5	1	1.5	1.5
Advance Minimum Transaction Charges for Futures Segment	NIL	1	NIL	NIL	1
Track Record	The Partners/Proprietor should not be defaulters on any stock exchange. They must not be debarred by SEBI for being associated with capital market as intermediaries. They must be engaged solely in the business of securities and must not be engaged in any fund-based activity.				

* *Additional IFSD of 25 lakhs with NSCCL is required for Trading and Clearing Members (TM-CM) and for Trading and Self clearing members (TM/SCM).*

** *Additional Collateral Security Deposit (CSD) of 25 lakh with NSCCL is required for Trading and Clearing members (TM-CM) and for Trading and Self clearing members (TM/SCM).*

***Admission**:* Admission is a two-stage process with applicants requiring to go through an examination (a module of NCFM) followed by an interview with the Membership Recommendation Committee. At any point of time the applicant has to ensure that at least the sole proprietor/ one of the designated partner/one of the designated director/compliance officer has a valid certificate for Securities Market (Basic) Module or Compliance Officers (Brokers) Module or the relevant module pertaining to the segments wherein membership of the Exchange has been sought.i.e.

(a) Capital Market (Dealers) Module

(b) Derivatives Market (Dealers) Module

(c) National Institute of Securities Markets (NISM) Series I – Currency Derivatives Certification Examination

Applicants are required to submit application form, in the prescribed format along with other relevant documents to the Exchange.

The application for new membership is then forwarded to Membership Recommendation Committee. The Membership Recommendation Committee (MRC) consists of seven persons from various disciplines. The MRC conducts interviews of the applicants for trading membership. In case of corporates, the dominant shareholder and designated directors; in case of individuals, the individual himself and in case of partnership firms – two designated partners have to appear for the interview. The purpose of the interview is to acquire information about their capability & commitment to carry on stock broking activities, financial standing and integrity.

The MRC recommends the names for admission of trading members to the Membership Approval Committee (Sub-committee of board of directors)/Board of directors of the Exchange.

The Board of Directors after taking into consideration the recommendations of the MRC either approves or rejects the applications.

On getting approval from the Board, an admission on a provisional basis is provided to the applicant subject to certain conditions like registration with SEBI, submission of relevant

fees/deposits and documents. The documents of the member are then forwarded to SEBI for registration.

After satisfying itself as to compliance with respect to all the prescribed norms, SEBI grants a Registration Certificate in the name of the applicant.

The applicant then has to remit the prescribed membership deposits (as required by the demand advice attached to the provisional offer letter) within the time frame prescribed in the demand advice attached to the provisional offer letter.

After obtaining SEBI Registration, payment of fees/deposits and submission of relevant documents, the trading member has to satisfy all the formalities and requirements of Exchange and NSCCL for enablement. The dealers on CM segment are required to clear the Capital Market (Dealers) Module of NCFM; dealers on Futures & Options Segment are required to clear the Derivatives Market (Dealers) Module or equivalent examination of NCFM and dealers on Currency Derivatives segment are required to clear National Institute of Securities Market (NISM) Series I- Currency Derivatives Certificate Examination. This is a pre-requisite without which user-ids are not issued.

After ensuring that all the formalities and requirements with regard to the Exchange and NSCCL are complied, the Trading Member is enabled to trade on the NEAT system.

3.2.3 Listing of securities

Listing means admission of securities of an issuer to trading privileges on a stock exchange through a formal agreement. The prime objective of admission to dealings on the Exchange is to provide liquidity and marketability to securities, as also to provide a mechanism for effective management of trading.

Listing Criteria

As per SEBI directive, an unlisted company may make an initial public offering (IPO) of equity shares or any other security which may be converted into or exchanged with equity shares at a later date, only if it meets all the following conditions:

(a) The company should have net tangible assets of at least Rs. 3 crore in each of the preceding 3 full years (of 12 months each), of which not more than 50% is held in monetary assets;

(b) The company should have a track record of distributable profits in terms of section 205 of the Companies Act, 1956, for at least three (3) out of immediately preceding five (5) years;

(c) The company should have a net worth of at least Rs. 1 crore in each of the preceding 3 full years (of 12 months each);

(d) In case the company has changed its name within the last one year, atleast 50% of the revenue for the preceding 1 full year is earned by the company from the activity suggested by the new name; and

(e) The aggregate of the proposed issue and all previous issues made in the same financial year in terms of size (i.e. offer through offer document + firm allotment + promoters' contribution through the offer document), does not exceed five (5) times its pre-issue networth as per the audited balance sheet of the last financial year.

Listing agreement

At the time of listing securities of a company on a stock exchange, the company is required to enter into a listing agreement with the exchange. The listing agreement specifies the terms and conditions of listing and the disclosures that shall be made by a company on a continuous basis to the exchange for the dissemination of information to the market.

Disclosure of audit qualifications:

SEBI has advised the Stock exchanges to modify the listing agreement to incorporate disclosure of audit qualifications. The same would include:

- disclosures of amounts at the year end and the maximum amount of loans/ advances/ investments outstanding during the year from both parent to subsidiary and vice versa,
- un-audited quarterly results of all listed companies should be subjected to Limited Review from the quarters ending on or after June 30, 2003,
- publication of consolidated financial results along with stand-alone financial results should be applicable on annual basis only. However, companies may have option to publish consolidated financial results along with stand alone financial results on a quarterly/half yearly basis,
- In addition to the above, the stock exchanges should also be required to inform SEBI in cases where companies have failed to remove audit qualifications.

3.2.4 Delisting of Securities

SEBI (Delisting of Securities) Guidelines 2003 are applicable to delisting of securities of companies and specifically apply to:

(a) Voluntary delisting being sought by the promoters of a company

(b) Any acquisition of shares of the company (either by a promoter or by any other person) or scheme or arrangement, by whatever name referred to, consequent to which the public shareholding falls below the minimum limit specified in the listing conditions or listing agreement that may result in delisting of securities

(c) Promoters of the companies who voluntarily seek to de-list their securities from all or some of the stock exchanges

(d) Cases where a person in control of the management is seeking to consolidate his holdings in a company, in a manner which would result in the public shareholding in

the company falling below the limit specified in the listing conditions or in the listing agreement that may have the effect of company being de-listed

(e) Companies which may be compulsorily de-listed by the stock exchanges: provided that company shall not be permitted to use the buy-back provision to delist its securities.

Voluntary Delisting

- Any promoter or acquirer desirous of delisting securities of the company under the provisions of these guidelines should obtain the prior approval of shareholders of the company by a special resolution passed at its general meeting, make a public announcement in the manner provided in these guidelines, make an application to the delisting exchange in the form specified by the exchange, and comply with such other additional conditions as may be specified by the concerned stock exchanges from where securities are to be de-listed.
- Any promoter of a company which desires to de-list from the stock exchange should determine an exit price for delisting of securities in accordance with the book building process as stated in the guidelines.
- The stock exchanges shall provide the infrastructure facility for display of the price at the terminal of the trading members to enable the investors to access the price on the screen to bring transparency to the delisting process. The stock exchange shall also monitor the possibility of price manipulation and keep under special watch the securities for which announcement for delisting has been made.

Compulsory De-listing of Companies

- The stock exchanges may de-list companies which have been suspended for a minimum period of six months for non-compliance with the listing agreement.
- The stock exchanges have to give adequate and wide public notice through newspapers and also give a show cause notice to a company. The exchange shall provide a time period of 15 days within which representation may be made to the exchange by any person who may be aggrieved by the proposed delisting.
- Where the securities of the company are de-listed by an exchange, the promoter of the company should be liable to compensate the security holders of the company by paying them the fair value of the securities held by them and acquiring their securities, subject to their option to remain security-holders with the company.

Reinstatement of De-listed Securities

Reinstatement of de-listed securities should be permitted by the stock exchanges with a cooling period of 2 years. It should be based on the respective norms/criteria for listing at the

time of making the application for listing and the application should be initially scrutinized by the CLA.

3.2.5 Listing of Securities on NSE

NSE plays an important role in helping Indian companies access equity capital, by providing a liquid and well-regulated market. NSE has 1,574 (as on 31st March, 2011) companies listed representing the length, breadth and diversity of the Indian economy which includes from hi-tech to heavy industry, software, refinery, public sector units, infrastructure, and financial services. Listing on NSE raises a company's profile among investors in India and abroad. Trade data is distributed worldwide through various news-vending agencies. More importantly, each and every NSE listed company is required to satisfy stringent financial, public distribution and management requirements. High listing standards foster investor confidence and also bring credibility into the markets.

NSE lists securities in its Capital Market (Equities) segment and its Wholesale Debt Market segment. NSE NEAT trading terminals are now situated in 203 cities across the length and breadth of India. Securities listed on the Exchange are required to fulfill the eligibility criteria for listing. Various types of securities of a company are traded under a unique symbol and different series.

Benefits of Listing on NSE

Listing on NSE provides qualifying companies with the broadest access to investors, the greatest market depth and liquidity, cost-effective access to capital, the highest visibility, the fairest pricing, and investor benefits.

(a) **A premier marketplace**: The sheer volume of trading activity ensures that the impact cost is lower on the Exchange which in turn reduces the cost of trading to the investor. NSE's automated trading system ensures consistency and transparency in the trade matching which enhances investors confidence and visibility of our market.

(b) **Visibility**: The trading system provides unparallel level of trade and post-trade information. The best 5 buy and sell orders are displayed on the trading system and the total number of securities available for buying and selling is also displayed. This helps the investor to know the depth of the market. Further, corporate announcements, results, corporate actions etc are also available on the trading system.

(c) **Largest exchange**: NSE is the largest exchange in the county in terms of trading volumes. NSE's reported turnover in the equities segment accounts for over 74 % of the total Indian securities market.

(d) **Unprecedented reach:** NSE provides a trading platform that extends across the length and breadth of the country. The Exchange uses the latest communication technology to give instant access to investors from many locations.

(e) **Modern infrastructure**: NSE introduced for the first time in India, fully automated screen based trading. The Exchange uses a sophisticated telecommunication network

with trading terminals connected through VSATs (Very Small Aperture Terminals) and leased lines.

(f) **Transaction speed:** The speed at which the Exchange processes orders, results in liquidity and best available prices. The Exchange's trading system on an average processes large numbers of orders per minute.

(g) **Short settlement cycles:** The exchanges follows a T+2 settlement cycle which is of international standards.

(h) **Broadcast facility for corporate announcements**: The NSE network is used to disseminate information and company announcements across the country. Important information regarding the company is announced to the market through the Broadcast Mode on the NEAT system as well as disseminated through the NSE's website. Corporate developments such as financial results, book closure, announcements of bonus, rights, takeover, mergers etc. are disseminated across the country thus minimizing scope for price manipulation or misuse.

(i) **Trade statistics for listed companies**: Listed companies are provided with monthly trade statistics for all the securities of the company listed on the Exchange.

(j) **Investor service centers**: Investor-service centers opened by NSE across the country cater to the needs of investors.

Listing criteria:

The Exchange has laid down criteria for listing of new issues by companies through IPOs, companies listed on other exchanges in conformity with the Securities Contracts (Regulation) Rules, 1957 and directions of the Central Government and the Securities and Exchange Board of India (SEBI). The criteria include minimum paid-up capital and market capitalisation, company/promoter's track record, etc. The listing criteria for companies in the CM Segment are presented in Table 3.4. The issuers of securities are required to adhere to provisions of the Securities Contracts (Regulation) Act, 1956, the Companies Act, 1956, the Securities and Exchange Board of India Act, 1992, and the rules, circulars, notifications, guidelines, etc. prescribed there under.

Table 3.4: Listing Criteria for Companies on the CM Segment of NSE

Criteria	Initial Public Offerings (IPOs)	Companies listed on other exchanges
Paid-up Equity Capital (PUEC)/Market Capitalisation (MC) /Net Worth	PUEC ≥ Rs. 10 cr. and MC ≥ Rs. 25 cr.	PUEC ≥ Rs. 10 cr. and MC ≥ Rs. 25 cr. OR PUEC ≥ Rs. 25 cr. OR MC ≥ Rs. 50 cr. OR The company shall have a net worth of not less than Rs.50 crores in each of the preceding financial years.

Criteria	Initial Public Offerings (IPOs)	Companies listed on other exchanges
Company/ Promoter's Track Record	Atleast 3 years track record of either a) the applicant seeking listing OR b) the promoters/promoting company incorporated in or outside India OR c) Partnership firm and subsequently converted into Company not in existence as a Company for three years and approaches the Exchange for listing. The Company subsequently formed would be considered for listing only on fulfillment of conditions stipulated by SEBI in this regard.	Atleast three years track record of either a) the applicant seeking listing; OR b) the promoters/promoting company, incorporated in or outside India.
Dividend Record / Net worth / Distributable Profits	--	Dividend paid in at least 2 out of the last 3 financial years immediately preceding the year in which the application has been made OR The networth of the applicants atleast Rs.50 crores OR The applicant has distributable profits in at least two out of the last three financial years.
Listing	--	Listed on any other recognized stock exchange for at least last three years OR listed on the exchange having nationwide trading terminals for at least one year.
Other Requirements	(a) No disciplinary action by other stock exchanges/regulatory authority in past 3 yrs. (b) Satisfactory redressal mechanism for investor grievances, (c) distribution of shareholding and (d) details of litigation record in past 3 years (e) Track record of Directors of the Company	(a) No disciplinary action by other stock exchanges/regulatory authority in past 3 yrs. (b) Satisfactory redressal mechanism for investor grievances, (c) distribution of shareholding and (d) details of litigation record in past 3 years. (e) Track record of Directors of the Company (f) Change in control of a Company/ Utilisation of funds raised from public

Note:

1. (a) In case of IPOs, Paid up Equity Capital means post issue paid up equity capital.
   (b) In case of Existing companies listed on other exchanges, the existing paid up equity capital as well as the paid up equity capital after the proposed issue for which listing is sought shall be taken into account.
2. (a) In case of IPOs, market capitalisation is the product of the issue price and the post-issue number of equity shares.
   (b) In case of case of Existing companies listed on other stock exchanges the market capitalisation shall be calculated by using a 12 month moving average of the market capitalisation over a period of six months immediately preceding the date of application. For the purpose of calculating the market capitalisation over a 12 month period, the average of the weekly high and low of the closing prices of the shares as quoted on the National Stock Exchange during the last twelve months and if the shares are not traded on the National Stock Exchange such average price on any of the recognised Stock Exchanges where those shares are frequently traded shall be taken into account while determining market capitalisation after making necessary adjustments for Corporate Action such as Rights / Bonus Issue/Split.

3. In case of Existing companies listed on other stock exchanges, the requirement of Rs.25 crores market capitalisation shall not be applicable to listing of securities issued by Government Companies, Public Sector Undertakings, Financial Institutions, Nationalised Banks, Statutory Corporations and Banking Companies who are otherwise bound to adhere to all the relevant statutes, guidelines, circulars, clarifications etc. that may be issued by various regulatory authorities from time to time
4. Net worth means paid-up equity capital + reserves excluding revaluation reserve - miscellaneous expenses not written off - negative balance in profit and loss account to the extent not set off.
5. Promoters mean one or more persons with minimum 3 years of experience of each of them in the same line of business and shall be holding at least 20 % of the post issue equity share capital individually or severally.
6. In case a company approaches the Exchange for listing within six months of an IPO, the securities may be considered as eligible for listing if they were otherwise eligible for listing at the time of the IPO. If the company approaches the Exchange for listing after six months of an IPO, the norms for existing listed companies may be applied and market capitalisation be computed based on the period from the IPO to the time of listing.

3.2.6 Dematerialisation

Traditionally, settlement system on Indian stock exchanges gave rise to settlement risk due to the time that elapsed before trades were settled. Trades were settled by physical movement of certificates. This had two aspects: First related to settlement of trade in stock exchanges by delivery of shares by the seller and payment by the buyer. The stock exchange aggregated trades over a period of time and carried out net settlement through the physical delivery of securities. The process of physically moving the securities from the seller to his broker to Clearing Corporation to the buyer's broker and finally to the buyer took time with the risk of delay somewhere along the chain. The second aspect related to transfer of shares in favour of the purchaser by the issuer. This system of transfer of ownership was grossly inefficient as every transfer involved the physical movement of paper securities to the issuer for registration, with the change of ownership being evidenced by an endorsement on the security certificate. In many cases the process of transfer took much longer than the two months as stipulated in the Companies Act, and a significant proportion of transactions ended up as bad delivery due to faulty compliance of paper work. Theft, forgery, mutilation of certificates and other irregularities were rampant, and in addition the issuer had the right to refuse the transfer of a security. Thus, the buyer did not get good title of the securities after parting with good money. All this added to costs and delays in settlement, restricted liquidity and made investor grievance redressal time-consuming and at times intractable.

To obviate these problems, the Depositories Act, 1996 was passed to provide for the establishment of depositories in securities with the objective of ensuring free transferability of securities with speed, accuracy and security by

- making securities of public limited companies freely transferable subject to certain exceptions;
- dematerialising the securities in the depository mode; and
- Providing for maintenance of ownership records in a book entry form.

In order to streamline both the stages of settlement process, the Depositories Act envisages transfer of ownership of securities electronically by book entry without making the securities move from person to person. The Act has made the securities of all public limited companies

freely transferable by restricting the company's right to use discretion in effecting the transfer of securities, and dispensing with the transfer deed and other procedural requirements under the Companies Act.

A depository holds securities in dematerialised form. It maintains ownership records of securities and effects transfer of ownership through book entry. By fiction of law, it is the registered owner of the securities held with it with the limited purpose of effecting transfer of ownership at the behest of the owner. The name of the depository appears in the records of the issuer as registered owner of securities. The name of actual owner appears in the records of the depository as beneficial owner. The beneficial owner has all the rights and liabilities associated with the securities. The owner of securities intending to avail of depository services opens an account with a depository through a depository participant (DP). The securities are transferred from one account to another through book entry only on the instructions of the beneficial owner.

In order to promote dematerialisation of securities, NSE joined hands with leading financial institutions to establish the National Securities Depository Ltd. (NSDL), the first depository in the country, with the objective of enhancing the efficiency in settlement systems as also to reduce the menace of fake/forged and stolen securities. This has ushered in an era of dematerialised trading and settlement. SEBI has made dematerialised settlement mandatory in an ever-increasing number of securities in a phased manner, thus bringing about an increase in the proportion of shares delivered in dematerialised form. This was initially introduced for institutional investors and was later extended to all investors. Starting with twelve scrips on January 15, 1998, all investors were required to mandatorily trade in dematerialised form in respect of 2,335 securities as at end-June 2001. By November 2001, 3811 companies were under demat mode and the rest of the companies were brought under compulsory demat mode by January 02, 2002. At the end of September 2010 2008, 8,514 and 7,392 companies were connected to NSDL and CDSL respectively. The number of dematerialised securities together at NSDL & CDSL increased from 39 billion at the end of March 2001 to 495 billion at the end of September 2010.

Pursuant to the SEBI directive on providing facility for small investors holding physical shares in the securities mandated for compulsory demat, the Exchange has provided such facility for trading in physical shares not exceeding 500 shares in the Limited Physical (LP) market segment.

Primarily all trades are now settled in dematerialized form. The share of demat delivery in total delivery at NSE increased to almost 100% in value terms.

3.3 TRADING

3.3.1 Trading Mechanism

The trading on stock exchanges in India used to take place through open outcry without

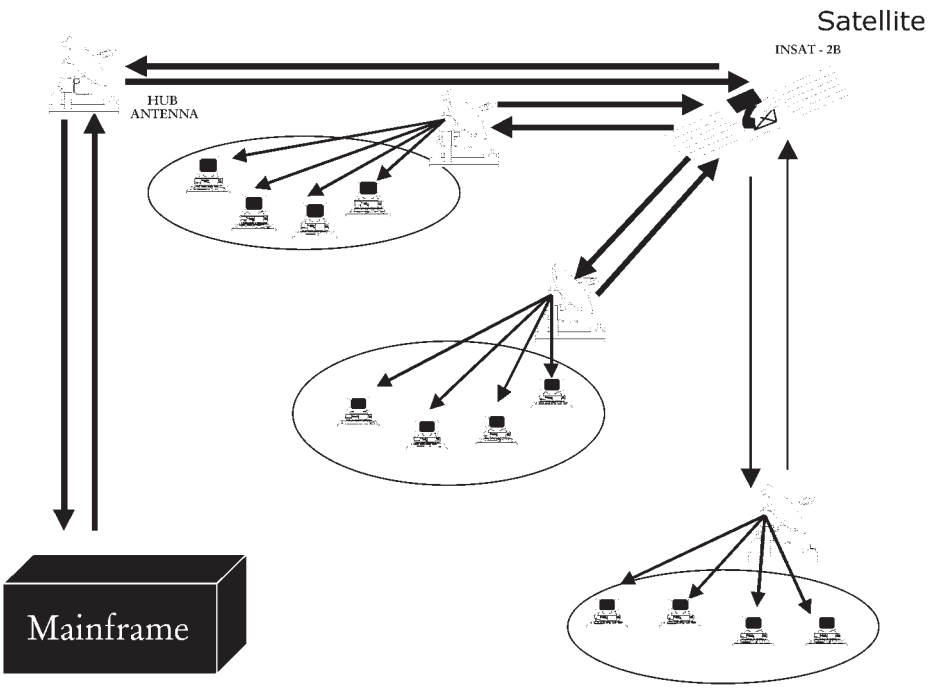
use of information technology for immediate matching or recording of trades. This was time consuming and inefficient. This imposed limits on trading volumes and efficiency. In order to provide efficiency, liquidity and transparency, NSE introduced a nation-wide on-line fully-automated screen based trading system (SBTS) where a member can punch into the computer quantities of securities and the prices at which he likes to transact and the transaction is executed as soon as it finds a matching sale or buy order from a counter party.

SBTS electronically matches orders on a strict price/time priority and hence cuts down on time, cost and risk of error, as well as on fraud resulting in improved operational efficiency. It allows faster incorporation of price sensitive information into prevailing prices, thus increasing the informational efficiency of markets. It enables market participants, irrespective of their geographical locations, to trade with one another simultaneously, improving the depth and liquidity of the market. It provides full anonymity by accepting orders, big or small, from members without revealing their identity, thus providing equal access to everybody. It also provides a perfect audit trail, which helps to resolve disputes by logging in the trade execution process in entirety. This diverted liquidity from other exchanges and in the very first year of its operation, NSE became the leading stock exchange in the country, impacting the fortunes of other exchanges and forcing them to adopt SBTS also. Today India can boast that almost 100% trading takes place through electronic order matching.

Technology was used to carry the trading platform from the trading hall of stock exchanges to the premises of brokers. NSE carried the trading platform further to the PCs at the residence of investors through the Internet and to handheld devices through Wireless Application Protocol (WAP) for convenience of mobile investors. This made a huge difference in terms of equal access to investors in a geographically vast country like India.

The trading network is depicted in **Figure 3.1**. NSE has main computer which is connected through Very Small Aperture Terminal (VSAT) installed at its office. The main computer runs on a fault tolerant STRATUS mainframe computer at the Exchange. Brokers have terminals (identified as the PCs in the Figure 3.1) installed at their premises which are connected through VSATs/leased lines/modems. An investor informs a broker to place an order on his behalf. The broker enters the order through his PC, which runs under Windows NT and sends signal to the Satellite via VSAT/leased line/modem. The signal is directed to mainframe computer at NSE via VSAT at NSE's office. A message relating to the order activity is broadcast to the respective member. The order confirmation message is immediately displayed on the PC of the broker. This order matches with the existing passive order(s) otherwise it waits for the active orders to enter the system. On order matching, a message is broadcast to the respective member.

Figure 3.1: Trading Network



The trading system operates on a strict price time priority. All orders received on the system are sorted with the best priced order getting the first priority for matching i.e., the best buy orders match with the best sell order. Similar priced orders are sorted on time priority basis, i.e. the one that came in early gets priority over the later one. Orders are matched automatically by the computer keeping the system transparent, objective and fair. Where an order does not find a match, it remains in the system and is displayed to the whole market, till a fresh order comes in or the earlier order is cancelled or modified. The trading system provides tremendous flexibility to the users in terms of kinds of orders that can be placed on the system.

Several time-related (day, immediate or cancel), price-related (buy/sell limit and stop loss orders) or volume related (Disclosed Quantity) conditions can be easily built into an order. The trading system also provides complete market information on-line. The market screen at any point of time provides complete information on total order depth in a security, the five best buys and sells available in the market, the quantity traded during the day in that security, the high and the low, the last traded price, etc. Investors can also know the fate of the orders almost as soon as they are placed with the trading members. Thus the NEAT system provides an Open Electronic Consolidated Limit Order Book (OECLOB). Limit orders are orders to buy or sell shares at a stated quantity and stated price. If the price quantity conditions do not match, the limit order will not be executed. The term 'limit order book' refers to the fact that only limit orders are stored in the book and all market orders are crossed against the limit orders

sitting in the book. Since the order book is visible to all market participants, it is termed as an 'Open Book'.

NEAT SYSTEM

The NEAT system supports an order driven market, wherein orders match on the basis of price and time priority. All quantity fields are in units and prices are quoted in Indian Rupees. The regular lot size and tick size for various securities traded is notified by the Exchange from time to time.

Market Types

The Capital Market system (the NEAT system) has four types of active markets:

(i) **Normal Market:** Normal market consists of various book types in which orders are segregated as Regular Lot Orders, Special Term Orders, and Stop Loss Orders depending on the order attributes.

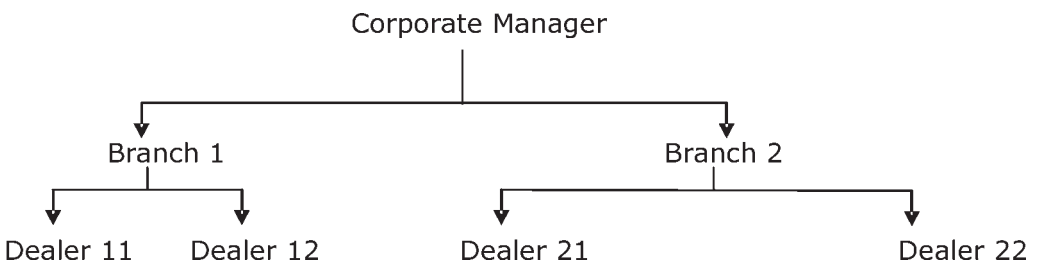
(ii) **Auction Market:** In the auction market, auctions are initiated by the exchange on behalf of trading members for settlement related reasons. The main features of this market are detailed in a separate section (3.13) on auction.

(iii) **Odd Lot Market:** The odd lot market facility is used for the Limited Physical Market and for the Block Trades Session. The main features of the Limited Physical Market are detailed in a separate section (3.14). The main features of the Block Trades Session are detailed in a separate section (3.15).

(iv) **Retail Debt Market:** The RETDEBT market facility on the NEAT system of capital market segment is used for transactions in Retail Debt Market session. Trading in Retail Debt Market takes place in the same manner as in equities (capital market) segment. The main features of this market are detailed in a separate section (3.16) on RETDEBT market.

Corporate Hierarchy

The trading member has the facility of defining a hierarchy amongst its users of the NEAT system. This hierarchy comprises:



The users of the trading system can logon as either of the user type. The significance of each type is explained below:

(i) **Corporate Manager:** The corporate manager is a term assigned to a user placed at the highest level in a trading firm. Such a user receives the end-of-day reports for all branches of the trading member. The facility to set branch order value limits and user order value limits is available to the corporate manager. The corporate manager also has facility to set symbol wise user order quantity limit. He can view outstanding orders and trades of all users of the trading member and can also cancel/modify outstanding orders of all users of the trading member.

(ii) **Branch Manager:** The branch manager is a term assigned to a user who is placed under the corporate manager. The branch manager receives end-of-day reports for all the dealers under that branch. He can set user order value limit for each of his branch. He can view outstanding orders and trades of all users of his branch and can also cancel/modify outstanding order of all users of his branch.

(iii) **Dealer:** Dealers are users at the lowest level of the hierarchy. A dealer can view and perform order and trade related activities only for himself and do not have access to information on other dealers under either the same branch or other branches.

Market Phases

The trading system is normally made available for trading on all days except Saturdays, Sundays and other holidays. Holidays are declared by the Exchange from time to time. A trading day typically consists of a number of discrete stages as below:

(i) **Opening:** The trading member can carry out the following activities after login to the NEAT system and before the market opens for trading:

(a) Set up Market Watch (the securities which the user would like to view on the screen)

(b) View Inquiry screens

At the point of time when the market is opening for trading, the trading member cannot login to the system. A message '*Market status is changing. Cannot logon for sometime*' is displayed. If the member is already logged in, he cannot perform trading activities till market is opened.

(ii) **Pre-open:** The pre-open session is for a duration of 15 minutes i.e. from 9:00 am to 9:15 am. The pre-open session is comprised of Order collection period and order matching period.

The order collection period of 8* minutes is provided for order entry, modification and cancellation. (* - System driven random closure between 7th and 8th minute). During this period orders can be entered, modified and cancelled.

The information like Indicative equilibrium / opening price of scrip, total buy and sell quantity of the scrip is disseminated on the NEAT Terminal to the members on real time basis.

Indicative NIFTY Index value & % change of indicative equilibrium price to previous close price are computed based on the orders in order book and are disseminated during pre-open session.

Order matching period starts immediately after completion of order collection period. Orders are matched at a single (equilibrium) price which will be open price. The order matching happens in the following sequence:

- Eligible limit orders are matched with eligible limit orders
- Residual eligible limit orders are matched with market orders
- Market orders are matched with market orders

Equilibrium price determination

In a call auction price mechanism, equilibrium price is determined as shown below. Assume that NSE received bids for particular stock xyz at different prices in between 9.00 am & 9:07/08 am. Based on the principle of demand supply mechanism, exchange will arrive at the equilibrium price - price at which the maximum number of shares can be bought / sold. In below example, the opening price will be 105 where maximum 27,500 shares can be traded.

Share Price	Order Book		Demand/Supply schedule		Maximum tradable Quantity
	Buy	Sell	Demand	Supply	
100	13500	11500	50500	11500	11500
104	9500	9500	37000	21300	21300
105	12000	15000	27500	36300	27500
106	6500	12000	15500	48300	15500
107	5000	12500	9000	60800	9000
108	4000	8500	4000	69300	4000

During order matching period order modification, order cancellation, trade modification and trade cancellation is not allowed. The trade confirmations are disseminated to respective members on their trading terminals before the start of normal market. After completion of order matching there is a silent period to facilitate the transition from pre-open session to the normal market. All outstanding orders are moved to the normal market retaining the original time stamp. Limit orders are at limit price and market orders are at the discovered equilibrium price. In a situation where no equilibrium price is discovered in the pre-open session, all market orders are moved to normal market at previous day's close price or adjusted close price / base price following price time priority. Accordingly, Normal Market / Odd lot Market and Retail Debt Market opens for

trading after closure of pre-open session i.e. 9:15 am. Block Trading session is available for the next 35 minutes from the open of Normal Market.

The opening price is determined based on the principle of demand supply mechanism. The equilibrium price is the price at which the maximum volume is executable. In case more than one price meets the said criteria, the equilibrium price is the price at which there is minimum unmatched order quantity. In case more than one price has same minimum order unmatched quantity, the equilibrium price is the price closest to the previous day's closing price. In case the previous day's closing price is the mid-value of pair of prices which are closest to it, then the previous day's closing price itself will be taken as the equilibrium price. In case of corporate action, previous day's closing price is adjusted to the closing price or the base price. Both limit and market orders are reckoned for computation of equilibrium price. The equilibrium price determined in pre-open session is considered as open price for the day. In case if only market orders exists both in the buy and sell side, then order is matched at previous days close price or adjusted close price / base price. Previous day's close or adjusted close price / base price is the opening price. In case if no price is discovered in pre-open session, the price of first trade in the normal market is the open price.

(iii) Normal Market Open Phase: The open period indicates the commencement of trading activity. To signify the start of trading, a message is sent to all the trader workstations. The market open time for different markets is notified by the Exchange to all the trading members. Order entry is allowed when all the securities have been opened. During this phase, orders are matched on a continuous basis. Trading in all the instruments is allowed unless they are specifically prohibited by the Exchange. The activities that are allowed at this stage are Inquiry, Order Entry, Order Modification, Order Cancellation (including quick order cancellation), Order Matching and Trade Cancellation.

(iv) Market Close: When the market closes, trading in all instruments for that market comes to an end. A message to this effect is sent to all trading members. No further orders are accepted, but the user is permitted to perform activities like inquiries and trade cancellation.

(v) Post-Close Market: This closing session is available only in Normal Market Segment. Its timings are from 3.50 PM to 4.00 PM. Only market price orders are allowed. Special Terms, Stop Loss and Disclosed Quantity Orders, Index Orders are not allowed. The trades are considered as Normal Market trades. Securities not traded in the normal market session are not allowed to participate in the Closing Session.

(vi) Surcon: Surveillance and Control (SURCON) is that period after market close during which, the users have inquiry access only. After the end of SURCON period, the system processes the data for making the system available for the next trading day. When the

system starts processing data, the interactive connection with the NEAT system is lost and the message to that effect is displayed at the trader workstation.

Major Segments of the NEAT Screen

The trader workstation screen of the trading member is divided into the following windows:

(i) **Title bar:** It displays trading system name i.e. NEAT, the trading member name the user id, user type, the date and the current time.

(ii) **Ticker Window:** The ticker displays information of all trades in the system as and when it takes place. The user has the option of selecting the securities that should appear in the ticker. Securities in ticker can be selected for each market type. On the extreme right hand of the ticker is the on-line index window that displays the current index value of NSE indices namely S&P CNX Nifty, S&P CNX Defty, CNX Nifty Junior, S&P CNX500, CNX Midcap, CNX IT, Bank Nifty, CNX 100 and Nifty Midcap 50, CNX Realty, CNX MNC, CNX FMCG, CNX Energy, CNX Infra, CNX Pharma, CNX PSU Bank, CNX PSE and CNX Service and India VIX. The user can scroll within these indices and view the index values respectively. Index point change with reference to the previous close is displayed along with the current index value. The difference between the previous close index value and the current index value becomes zero when the Nifty closing index is computed for the day.

The ticker window displays securities capital market segments. The ticker selection facility is confined to the securities of capital market segment only. The first ticker window, by default, displays all the derivatives contracts traded in the Futures and Options segment.

(iii) **Tool Bar:** The toolbar has functional buttons which can be used with the mouse for quick access to various functions such as Buy Order Entry, Sell Order Entry, Market By Price (MBP), Previous Trades (PT), Outstanding Order (OO), Activity Log (AL), Order Status (OS), Market Watch (MW), Snap Quote (SQ), Market Movement (MM), Market Inquiry (MI), Auction Inquiry (AI), Order Modification (OM), Order Cancellation (OCXL), Security List, Net Position, Online Backup, Supplementary Menu, Index Inquiry, Index Broadcast and Help. All these functions are also accessible through the keyboard.

(iv) **Market Watch Window:** The *'Market Watch'* window is the main area of focus for a trading member. This screen allows continuous monitoring of the securities that are of specific interest to the user. It displays trading information for the selected securities.

(v) **Inquiry Window:** This screen enables the user to view information such as Market by Order (MBO), Market By Price (MBP), Previous Trades (PT), Outstanding Orders (OO), Activity Log (AL), Order Status (OS), Market Movement (MM), Market Inquiry (MI), Net Position, Online Backup, Index Inquiry, Indices Broadcast, Most Active Securities and so on. Relevant information for the selected security can be viewed.

(vi) Snap Quote: The snap quote feature allows a trading member to get instantaneous market information on any desired security. This is normally used for securities that are not already set in the Market Watch window. The information presented is the same as that of the Marker Watch window.

(vii) Order/Trade Window: This window enables the user to enter/modify/cancel orders and to send request for trade cancellation and modification.

(viii) Message Window: This enables the user to view messages broadcast by the exchange such as corporate actions, any market news, auctions related information etc. and other messages like order confirmation, order modification, order cancellation, orders which have resulted in quantity freezes/price freezes and the exchange action on them, trade confirmation, trade cancellation/modification requests and exchange action on them, name and time when the user logs in/logs off from the system, messages specific to the trading member, etc. These messages appear as and when the event takes place in a chronological order.

Basket Trading

The purpose of Basket Trading is to provide NEAT users with a facility to create offline order entry file for a selected portfolio. On inputting the value, the orders are created for the selected portfolio of securities according to the ratios of their market capitalisations. All the orders generated through the offline order file are priced at the available market price.

Quantity of shares of a particular security in portfolio are calculated as under:

$$\text{No. of Shares of a security in portfolio} = \frac{\text{Amount *Issued Capital for the Security}}{\text{Current Portfolio Capitalization}}$$

Where:

Current Portfolio Capitalisation = Summation [Last Traded Price (Previous close if not traded) * No. of Issued shares]

In case at the time of generating the basket if any of the constituents are not traded, the weightage of the security in the basket is determined using the previous close price. This price may become irrelevant if there has been a corporate action in the security for the day and the same has not yet been traded before generation of the file. Similarly, basket facility will not be available for a new listed security till the time it is traded.

Reverse Basket on Traded Quantity

The Reverse Basket Trading provides the users with an offline file for reversing the trades that have taken place for a basket order. This file will contain orders for different securities of the selected basket file. The Orders are created according to the volume of trade that has taken place for that basket. This helps to monitor the current status of the basket file as the latest status of the orders are displayed in the list box. It is advisable to create each basket with a

different name and clean up the directories regularly and not tamper with the original basket file once it has been loaded as it may give erroneous results.

Index Trading

The purpose of Index Trading is to provide users with a facility of buying and selling of Indexes, in terms of securities that comprises the Index. The users have to specify the amount, and other inputs that are sent to the host, and the host generates the orders. The Index Trading enables the users for buying or selling an Index Basket. Putting orders in securities in proportion that comprises the chosen index, simulates the buying and selling of Index basket.

Formula Used to calculate no of shares of each security is

$$\text{No of Shares of a security in index} = \frac{\text{Amount} * \text{Issued Capital for the security} * \text{Free Float Factor}}{\text{Current Market Capitalization of the Index}}$$

Current Market Capitalization of the Index =

Summation [Last Traded Price (Previous close if not traded) * No of Issued shares]

The no of shares are rounded off to the nearest integer. If the Index basket contains any security whose regular lot is not one, then the file will need to be corrected by the user to accommodate shares in tradable lots.

Buy Back Trades

The purpose of Buy Back Trade functionality is to give information to the market about the buy back trades executed from the start of the buy back period till current trading date in the securities whose buyback period is currently on. The front screen shows Symbol, Series, Low price (Today), High price (Today), Weightage. Average price, Volume (Today) and Previous day Volume.

3.3.2 Order Management

Order Management consists of entering orders, order modification, order cancellation and order matching.

Entering Orders

The trading member can enter orders in the normal market and auction market. A user can place orders in any of the above mentioned markets by invoking the respective order entry screens.

Active & Passive Orders*:* When any order enters the trading system, it is an active order. It tries to find a match on the other side of the books. If it finds a match, a trade is generated. If it does not find a match, the order becomes a passive order and goes and sits in the order book.

Order Books: As and when valid orders are entered or received by the trading system, they are first numbered, time stamped and then scanned for a potential match. This means that each order has a distinctive order number and a unique time stamp on it. If a match is not found, then the orders are stored in the books as per the price/time priority. Price priority means that if two orders are entered into the system, the order having the best price gets the higher priority. Time priority means if two orders having the same price is entered, the order that is entered first gets the higher priority. Best price for a sell order is the lowest price and for a buy order, it is the highest price.

The different order books in the NEAT system are as detailed below:

- **Pre-open Book**: - An order during Preopen session has to be a Preopen (PO) order. All the Preopen orders are stacked in system till the Preopen phase. At the end of Preopen phase, the matching of Preopen orders takes place at the Final Opening Price. By default, the Preopen (PO) book appears in the order entry screen when the Normal Market is in Preopen and the security is eligible for Preopen Session. Order entry in preopen book type is allowed only during market status is in preopen.
- **Regular Lot Book:** An order that has no special condition associated with it is a Regular Lot order. When a dealer places this order, the system looks for a corresponding Regular Lot order existing in that market (Passive orders). If it does not find a match at the time it enters the system, the order is stacked in the Regular Lot book as a passive order. By default, the Regular Lot book appears in the order entry screen in the normal market. Buyback orders can be placed through the Regular Lot (RL) book in the Normal Market. The member can place a buyback order by specifying 'BUYBACKORD' in the Client Account field in the order entry screen. Such company buyback orders will be identified in MBP screen by an '*' (asterisk) indicator against such orders.
- **Special Terms Book:** Orders which have a special term attribute attached to it are known as special terms orders. When a special term order enters the system, it scans the orders existing in the Regular Lot book as well as Special Terms Book. Currently this facility is not available in the trading system.
- **Stop Loss Book:** Stop Loss (SL) orders are released into the market when the last traded price for that security in the normal market reaches or surpasses the trigger price. Before triggering, the order does not participate in matching and the order cannot get traded. Untriggered stop loss orders are stacked in the stop loss book. The stop loss orders can be either a market order or a limit price order. For buy SL orders, the trigger price has to be less than or equal to the limit price. Similarly, for sell SL orders, the trigger price has to be greater than or equal to the limit price.
- **Odd Lot Book:** The Odd Lot book can be selected in the order entry screen in order to trade in the Odd Lot market. Order matching in this market takes place between two

orders on the basis of quantity and price. To enter orders in the odd lot market, select the book type as OL.

- **RETDEBT Order Book:** RETDEBT market orders can be entered into the system by selecting the RETDEBT Order book. These orders scan only the RETDEBT Order book for potential matches. If no suitable match can be found, the order is stored in the book as a passive order. To enter orders in the RETDEBT market, select the book type as 'D'.
- **Auction Order Book:** Auction order book stores orders entered by the trading members to participate in the Exchange initiated auctions. Auction orders can be initiator orders, competitor orders and solicitor orders.

Symbol & Series: Securities can be selected to the order entry screen from any of the inquiry screens such as MBP, OO, PT, AL, MI and SQ. In case the security is not set up in the Market Watch screen, the Security List can also be used to select the codes as default values.

Order entry in a security is not possible if that security is either suspended from trading or not eligible to trade in a particular market.

Quantity: Quantity should be mentioned in multiples of regular lot size for that security.

Price: A user has the option to either enter the order at the default price or overwrite it with any other desired price. If a user mentions a price, it should be in multiples of the tick size for that particular security and within the day's minimum/maximum price range.

In case of stop loss orders, a user has the flexibility of specifying a limit price along with the trigger price.

Order Types and Conditions: The system allows the trading members to enter orders with various conditions attached to them as per their requirements. These conditions are broadly divided into Time Conditions, Quantity Conditions, Price Conditions and Other Conditions. Several combinations of the above are allowed thereby providing enormous flexibility to the users. The order types and conditions are summarised below:

a) ***Time Conditions***

DAY**:** A DAY order, as the name suggests is an order that is valid for the day on which it is entered. If the order is not executed during the day, the system cancels the order automatically at the end of the day.

IOC**:** An Immediate or Cancel (IOC) order allows the user to buy or sell a security as soon as the order is released into the system, failing which the order is cancelled from the system. Partial match is possible for the order, and the unmatched portion of the order is cancelled immediately.

b) ***Quantity Conditions***

DQ**:** An order with a Disclosed Quantity (DQ) allows the user to disclose only a portion

of the order quantity to the market. For e.g. if the order quantity is 10,000 and the disclosed quantity is 2,000, then only 2,000 is disclosed to the market.

Security Wise User Order Quantity Limit (SUOQL) : An additional facility for setting up Security wise User wise Order Quantity Limits (SUOQL) for buy and/or sell has now been provided.

(a) The Corporate Manager is allowed to set the SUOQL separately for buy and sell orders for each security for all the Branch Managers (BMs) and Dealers (except inquiry only users) under him including himself.

(b) It is possible to modify the SUOQL anytime during trading hours. SUOQL should not be set lower than the used limit for that security. For a Symbol both Buy and Sell quantity can be set to unlimited.

(c) The used limit field is displayed for buy and sell separately for each security.

(d) Any activity like order modification or cancellation gets reflected in used limit figure for the respective security and respective side.

(e) This limit is applicable for a symbol across all series, across all the markets. SUOQL setting option is given in supplementary menu.

(f) A bulk upload facility to set the security wise buy sell limit through a (comma separated values) csv file has been provided. In case of failure to upload a particular record/s, failure message is written in the input file in the form of an error code. The file is reusable.

(g) SUOQL bulk upload facility is not available during the market hours.

(h) After the limit is set successfully, the message is sent to the respective CM/BM/dealer.

(i) A facility to limit trading to the securities set up in the SUOQL has been provided. If limit trading option is set for a user, then the user is allowed to place orders only for Symbols set in his SUOQL list by the CM. It would however be possible to enable this facility without having any security in the SUOQL list, which in turn prevents the user from entering of any fresh orders.

(j) Corporate Manager has been given a facility to allow or disallow a user from entering Index orders. By default all dealers will be allowed to place index orders. Index orders are not validated for SUOQL limits. However, orders once entered are updated in the used limits.

(k) It is possible that dealer is restricted to enter order in particular security, but allowed to enter index order and that restricted security is a part of Nifty.

(l) If the order is modified by CM/BM for a respective dealer then the used limit will be updated accordingly, but in this case it can exceed the set limit.

(m) SUOQL used limit will not be validated and updated for Auction orders.

Quantity Freeze: All orders with very large quantities receive quantity alert at member terminal. If members enter any order exceeding the lowest of the quantity given below, it results in an alert which reads as *"Order entered exceeds alert quantity limit. Confirm availability of adequate capital to proceed"* and only after the member clicks the button 'Yes' the order will be further processed for execution.

Quantity Freeze parameters:-

- 0.5% of the issue size of the security or
- value of the order is around Rs. 2.5 crores or
- a global alert quantity limit of more than 25000 irrespective of the issue size of the security, whichever is less.

c) Price Conditions

***Market Orders*:** Market orders are orders for which price is specified as 'MKT' at the time the order is entered. For such orders, the system determines the price.

***Stop-Loss*:** This facility allows the user to release an order into the system, after the market price of the security reaches or crosses a threshold price called trigger price.

***Trigger Price*:** Price at which an order gets triggered from the stop loss book.

***Limit Price*:** Price of the orders after triggering from stop loss book.

***Price Freeze*:** Since no price bands are applicable in respect of securities on which derivative products are available or securities included in indices on which derivative products are available, in order to prevent members from entering orders at non-genuine prices in such securities, the exchange has decided to introduce operating range of 20% for such securities. Any order above or below 20% over the base price should come to the exchange as a price freeze.

Market Price Protection

Market Price protection functionality gives an option to a trader to limit the risk of a market order, within a pre-set percentage of the Last Trade Price (LTP).The pre-set Market price protection percentage is by default set to 5% of the LTP. The users can change the pre-set Market price protection percentage from the Order Limit Screen which can be invoked from the Supplementary Menu. The set percentage will be applicable till the Ntreltdr EXE is re-inflated.

At the time of order entry, the user can press (Page Up) when the cursor is in the price field. In case of a buy order, this defaults a price value, which is greater than LTP by a pre-set percentage. In case of a sell order the default value will be lesser than the LTP by a pre set percentage. The time condition in both cases will automatically change

to IOC. The user has the option to change any of the fields. Since the calculations are based on LTP of broadcast for the security is not received, the default value will be 'MARKET'

d) Other Conditions

***PRO/CLI*:** A user can enter orders on his own account or on behalf of clients. By default, the system assumes that the user is entering orders on the trading member's own account.

***Participant Code*:** By default, the system displays the trading member id of the user in the participant field. Thus, all trades resulting from an order are to be settled by that trading member. Non-custodial institutional trade (NCIT) orders can be marked by the user at the order entry level itself. Only a valid participant code can be entered. In case the participant is suspended a message to this effect is displayed to the user on the order entry screen.

Branch Order Value Limit Check: In addition to the checks performed for the fields explained above, every order entry is checked for the branch order value limit. In case the set order value limit is exhausted the subsequent order is rejected by the system.

Order Modification

All orders can be modified in the system till the time they do not get fully traded and only during market hours. Once an order is modified, the branch order value limit for the branch gets adjusted automatically. Order modification is rejected if it results in a price freeze, message displayed is 'CFO request rejected'.

Order Cancellation

Order cancellation functionality can be performed only for orders which have not been fully or partially traded (for the untraded part of partially traded orders only) and only during market hours and in preopen period.

Order Matching

The buy and sell orders are matched on Book Type, Symbol, Series, Quantity and Price.

Matching Priority: The best sell order is the order with the lowest price and a best buy order is the order with the highest price. The unmatched orders are queued in the system by the following priority:

(a) ***By Price*:** A buy order with a higher price gets a higher priority and similarly, a sell order with a lower price gets a higher priority. E.g. Consider the following buy orders:

1) 100 shares @ Rs. 35 at time 10:30 a.m.

2) 500 shares @ Rs. 35.05 at time 10:43 a.m.

The second order price is greater than the first order price and therefore is the best buy order.

(b) ***By Time*:** If there is more than one order at the same price, the order entered earlier gets a higher priority. E.g. Consider the following sell orders:

1) 200 shares @ Rs. 72.75 at time 10:30 a.m.

2) 300 shares @ Rs. 72.75 at time 10:35 a.m.

Both orders have the same price but they were entered in the system at different time. The first order was entered before the second order and therefore is the best sell order.

As and when valid orders are entered or received by the system, they are first numbered, time stamped and then scanned for a potential match. This means that each order has a distinctive order number and a unique time stamp on it. If a match is not found, then the orders are stored in the books as per the price/time priority.

An active buy order matches with the best passive sell order if the price of the passive sell order is less than or equal to the price of the active buy order. Similarly, an active sell order matches with the best passive buy order if the price of the passive buy order is greater than or equal to the price of the active sell order.

3.3.3 Trade Management

A trade is an activity in which a buy and a sell order match with each other. Matching of two orders is done automatically by the system. Whenever a trade takes place, the system sends a trade confirmation message to each of the users involved in the trade. The trade confirmation slip gets printed at the trader workstation of the user with a unique trade number. The system also broadcasts a message to the entire market through the ticker window displaying the details of the trade.

Trade Verification

With a facility to verify trades on the NSE website, an investor who has received a contract note from a trading member of the Exchange, can check whether the trade has been executed on the Exchange. This facility is available on the NSE website for the Capital Market, Derivatives (F&O) and Retail Debt Market segments.

Trade details are available for verification on the same day (i.e. T itself) after 19:00 hours IST as well as trade details of all trades for the last 5 trading days are available on the website. (i.e. trades executed on 'T' day, can be verified till the T+4th day. The investor needs to input minimum details of the trade viz. client code (provided by the trading member), security details (symbol and series), order number, trade number, trade quantity and price (excluding brokerage). All the above details are mandatory. If an identical match is found for the details provided, a confirmation along with the details of the trade is displayed to the investor. If no

match is found, a message is displayed to that effect. Where no match is found, investors are advised to contact their trading member for clarification.

Trade Cancellation

The user can use trade cancellation screen for cancelling trades done during the day. If the user is a corporate manager of a trading member firm, he can request for trade cancellation for the trades of any dealer of the trading members firm and if he is a branch manager of a branch, then he can request for trade cancellation for the trades for any dealer of the branch of the trading member firm.

The user can request for trade cancellation either from the previous trades screen or by using the function key provided in the workstation. The trade cancellation request is sent to the Exchange for approval and message to that effect is displayed in the message window. The counterparty to the trade also receives the message. The counterparty then has to make similar request on the same trading day. Once both the parties to trade send the trade cancellation request, the Exchange either approves or rejects it. The message to that effect is displayed in the message window.

When a request for the trade cancellation is approved by the Exchange, the parties to trade receive a system message confirming the trade cancellation and the trade cancellation slip is printed at their respective trader workstations. If the Exchange rejects the trade cancellation request, the trade cancellation rejection slip is printed at their respective trader workstations. If counter party to the trade does not entered a trade cancellation request the Exchange reject the trade cancellation request.

3.3.4 Auction

Auctions are initiated by the Exchange on behalf of trading members for settlement related reasons. The main reasons are shortages,bad deliveries and objections. There are three types of participants in the auction market:

(a) *Initiator*: The party who initiates the auction process is called an initiator.

(b) *Competitor*: The party who enters on the same side as of the initiator is called a competitor.

(c) *Solicitor*: The party who enters on the opposite side as of the initiator is called a solicitor.

The trading members can participate in the Exchange initiated auctions by entering orders as a solicitor. E.g. If the Exchange conducts a Buy-In auction, the trading members entering sell orders are called solicitors.

When the auction starts, the competitor period for that auction also starts. Competitor period is the period during which competitor order entries are allowed. Competitor orders are the

orders which compete with the initiator's order i.e. if the initiator's order is a buy order, then all the buy orders for that auction other than the initiator's order are competitor orders. And if the initiator order is a sell order then all the sell orders for that auction other than the initiators order are competitor orders.

After the competitor period ends, the solicitor period for that auction starts. Solicitor period is the period during which solicitor order entries are allowed. Solicitor orders are the orders which are opposite to the initiator order i.e. if the initiator order is a buy order, then all the sell orders for that auction are solicitor orders and if the initiator order is a sell order, then all the buy orders for that auction are solicitor orders.

After the solicitor period, order matching takes place. The system calculates trading price for the auction and all possible trades for the auction are generated at the calculated trading price. After this the auction is said to be complete. Competitor period and solicitor period for any auction are set by the Exchange.

***Entering Auction Orders*:** Auction order entry allows the user to enter orders into auctions that are currently running.

***Auction Order Modification*:** The user is not allowed to modify any auction orders.

***Auction Order Cancellation*:** The user can cancel any solicitor order placed by him in any auction provided the solicitor period for that auction is not over.

***Auction Order Matching*:** When the solicitor period for an auction is over, auction order matching starts for that auction. During this process, the system calculates the trading price for the auction based on the initiator order and the orders entered during the competitor and the solicitor period. At present for Exchange initiated auctions, the matching takes place at the respective solicitor order prices.

All auction orders are entered into the auction order book. The rules for matching of auctions are similar to that of the regular lot book except for the following points:-

a) Auction order matching takes place at the end of the solicitor period for the auction.

b) Auction matching takes place only across orders belonging to the same auction.

c) All auction trades take place at the auction price.

***Example 1*:** Member A places a buy order for 1000 shares of ABC Ltd. in the NEAT system at 11:22:01 for Rs.155 per share. Member B places a sell order for 2000 shares of ABC Ltd. at 11:22:02 for Rs.150 per share. Assume that no other orders were available in the system during this time. Whether the trade will take place and if yes, at what price?

Yes, 1000 shares will get traded at Rs.155 per share (the passive price).

***Example 2*:** Auction is held in TISCO for 5,000 shares.

a) The closing price of TISCO on that day was Rs.155.00

b) The last traded price of TISCO on that day was Rs.150.00

c) The price of TISCO last Friday was Rs.151.00

d) The previous days' close price of TISCO was Rs.160.00

What is the maximum allowable price at which the member can put a sell order in the auction for TISCO? (Assuming that the price band applicable for auction market is +/-15%)

Max price applicable in auction = Previous days' close price * Price band
= Rs.160*1.15 =Rs.184.00

3.3.5 Internet Broking

SEBI Committee approved the use of Internet as an Order Routing System (ORS) for communicating clients' orders to the Exchanges through brokers. ORS enables investors to place orders with his broker and have control over the information and quotes and to hit the quote on an on-line basis. Once the broker's system receives the order, it checks the authenticity of the client electronically and then routes the order to the appropriate Exchange for execution. On execution of the order, it is confirmed on real time basis. Investor receives reports on margin requirement, payments and delivery obligations through the system. His ledger and portfolio account get updated online.

NSE was the first stock exchange in India to launch internet trading in early February 2000. It provides web-based access to investors to trade directly on the Exchange. The orders originating from the PCs of the investors are routed through the Internet to the trading terminals of the designated brokers with whom they are connected and further to the Exchange for trade execution. Soon after these orders get matched and result into trades, the investors get confirmation about them on their PCs through the same internet route.

3.3.6 Wireless Application Protocol

SEBI has also approved trading through wireless medium on WAP Platform. NSE-IT launched the Wireless Application Protocol (WAP) in November 2000. This provides access to its order book through the hand held devices, which use WAP technology. This serves primarily retail investors who are mobile and want to trade from any place when the market prices for stocks at their choice are attractive. Only SEBI registered members who have been granted permission by the Exchange for providing internet based trading services can introduce the service after obtaining permission from the Exchange.

3.3.7 Trading Rules

Insider Trading

Insider trading is prohibited and is considered an offence. The SEBI (Prohibition of Insider Trading) Regulations, 1992 prohibit an insider from dealing (on his own behalf or on behalf

of others) in listed securities when in possession of 'unpublished price sensitive information' or communicate, counsel or procure directly or indirectly any unpublished price sensitive information to any person who while in possession of such unpublished price sensitive information should not deal in securities. Price sensitive information is any information, which if published, is likely to materially affect the price of the securities of a company. Such information may relate to the financial results of the company, intended declaration of dividends, issue of securities or buy back of securities, amalgamation, mergers, takeovers, any major policy changes, etc. SEBI, on the basis of any complaint or otherwise, investigates/ inspects the allegation of insider trading. On the basis of the report of the investigation, SEBI may prosecute persons found *prima facie* guilty of insider trading in an appropriate court or pass such orders as it may deem fit. Based on inspection, an adjudicating officer appointed by SEBI can impose monetary penalty.

In order to strengthen insider trading regulations, SEBI mandated a code of conduct for listed companies, its employees, analysts, market intermediaries and professional firms. The insider trading regulations were amended to include requirements for initial and continual disclosure of shareholding by directors or officers, who are insiders, and substantial shareholders (holding more than 5% shares/voting rights) of listed companies. The listed companies are also mandated to adopt a code of disclosure with regard to price sensitive information, market rumours, and reporting of shareholding/ownership, etc.

Unfair Trade Practices

The SEBI (Prohibition of Fraudulent and Unfair Trade Practices in relation to the Securities Market) Regulations, 2003 enable SEBI to investigate into cases of market manipulation and fraudulent and unfair trade practices. These regulations empower SEBI to investigate into violations committed by any person, including an investor, issuer or an intermediary associated with the securities market. The regulations define frauds as acts, expression, omission or concealment committed whether in a deceitful manner or not by a person or by any other person or agent while dealing in securities in order to induce another person with his connivance or his agent to deal in securities, whether or not there is any wrongful gain or avoidance of any loss. The regulations specifically prohibit dealing in securities in a fraudulent manner, market manipulation, misleading statements to induce sale or purchase of securities, and unfair trade practices relating to securities. SEBI can conduct investigation, *suo moto* or upon information received by it, through an investigation officer in respect of conduct and affairs of any person buying/selling/dealing in securities. Based on the report of the investigating officer, SEBI can initiate action for suspension or cancellation of registration of an intermediary.

Takeovers

Owing to several factors such as the growth of Mergers & Acquisitions activity in India as the preferred mode of restructuring, the increasing sophistication of takeover market, the

decade long regulatory experience and various judicial pronouncements, it was felt necessary to review the Takeover Regulations 1997. Accordingly, SEBI formed a Takeover Regulations Advisory Committee (TRAC) in September 2009 under the Chairmanship of (Late) Shri. C. Achuthan, Former Presiding Officer, Securities Appellate Tribunal (SAT) for this purpose. After extensive public consultation on the report submitted by TRAC, SEBI came out with the Substantial Acquisition of Shares and Takeovers Regulations 2011 which were notified on September 23, 2011. The Takeover Regulations, 1997 stand repealed from October 22, 2011, i.e. the date on which SAST Regulations, 2011 come into force.

As per **SEBI (Substantial Acquisition of Shares and Takeovers) Regulations, 2011**, some key points are:

- Persons acting in Concert or 'PAC' in the context of SAST Regulations, 2011 are individual(s)/company (ies) or any other legal entity (ies) who, with a common objective or purpose of acquisition of shares or voting rights in, or exercise of control over the target company, pursuant to an agreement or understanding, formal or informal, directly or indirectly cooperate for acquisition of shares or voting rights in, or exercise of control over the target company.
- An open offer under the SAST Regulations, 2011 - is an offer made by the acquirer to the shareholders of the target company inviting them to tender their shares in the target company at a particular price. The primary purpose of an open offer is to provide an exit option to the shareholders of the target company on account of the change in control or substantial acquisition of shares, occurring in the target company.
- If an acquirer has agreed to acquire or acquired control over a target company or shares or voting rights in a target company which would be in excess of the threshold limits, then the acquirer is required to make an open offer to shareholders of the target company.
- An acquirer, who (along with PACs, if any) holds less than 25% shares or voting rights in a target company and agrees to acquire shares or acquires shares which along with his/ PAC's existing shareholding would entitle him to exercise 25% or more shares or voting rights in a target company, will need to make an open offer before acquiring such additional shares.
- An acquirer who (along with PACs, if any) holds 25% or more but less than the maximum permissible non-public shareholding in a target company, can acquire additional shares in the target company as would entitle him to exercise more than 5% of the voting rights in any financial year ending March 31, only after making an open offer.
- Maximum permissible non-public shareholding is derived based on the minimum public shareholding requirement under the Securities Contracts (Regulations) Rules 1957 ("SCRR").

- For computing acquisitions limits for creeping acquisition specified under regulation 3(2), gross acquisitions/ purchases shall be taken in to account thereby ignoring any intermittent fall in shareholding or voting rights whether owing to disposal of shares or dilution of voting rights on account of fresh issue of shares by the target company.
- A voluntary open offer under Regulation 6, is an offer made by a person who himself or through Persons acting in concert ,if any, holds 25% or more shares or voting rights in the target company but less than the maximum permissible non-public shareholding limit.

Voluntary offer by a person holding less than 25%	**Voluntary offer by a person holding more than 25%**
Minimum offer size of 26%.	Minimum offer size of 10%.
Maximum can be for entire share capital of the target company	The maximum offer size is linked to maximum permissible non public shareholding permitted under Securities Contracts (Regulations) Rules 1957.
No such conditions	• Acquirer should not have acquired any shares during 52 weeks period prior to Public Announcement. • Acquirer is not entitled to acquire any shares of the target company for a period of 6 months after the completion of the open offer except for a voluntary open offer.

- An open offer, other than a voluntary open offer under Regulation 6, must be made for a minimum of 26% of the target company's share capital. The size of voluntary open offer under Regulation 6 must be for at least 10% of the target company's share capital. Further the offer size percentage is calculated on the fully diluted share capital of the target company taking in to account potential increase in the number of outstanding shares as on 10th working day from the closure of the open offer.
- If the target company's shares are frequently traded then the open offer price for acquisition of shares under the minimum open offer shall be highest of the following:
  - Highest negotiated price per share under the share purchase agreement ("SPA") triggering the offer;
  - Volume weighted average price of shares acquired by the acquirer during 52 weeks preceding the public announcement ("PA");
  - Highest price paid for any acquisition by the acquirer during 26 weeks immediately preceding the PA;
  - Volume weighted average market price for sixty trading days preceding the PA.
- Since indirect acquisitions involve acquiring the target company as a part of a larger business, SAST Regulations, 2011 have prescribed additional parameters to be taken into account for determination of the offer price. If the size of the target company exceeds certain thresholds as compared to the size of the entity or business being

acquired then the acquirer is required to compute and disclose in the letter of offer, the per share value of the target company taken into account for the acquisition, along with the methodology.

- Further, in indirect acquisitions which are not in the nature of deemed direct acquisition, the offer price shall stand enhanced by an amount equal to a sum determined at the rate of 10% per annum for the period between the date on which primary acquisition was contracted and the date of Detailed Public Statement.
- The term 'offer period' pertains to the period starting from the date of the event triggering open offer till completion of payment of consideration to shareholders by the acquirer or withdrawal of the offer by the acquirer as the case may be.
- The term 'tendering period' refers to the 10 working days period falling within the offer period, during which the eligible shareholders who wish to accept the open offer can tender their shares in the open offer.

Further, the regulations also deals with appointment of merchant banker, timing of public announcement of offer, contents of public announcement of offer, Offer price, Disclosures required under (i) public announcement (ii) detailed public statement (iii) letter of offer, Creeping acquisition, General obligations of the acquirer, General Obligations of the board of directors of the target company, General obligations of the merchant banker, Competitive bid etc.

Buy back

Buy back aims at improving liquidity in the shares of companies and helps corporates in enhancing the shareholders' wealth. Under the SEBI (Buy Back of Securities) Regulations, 1998, a company is permitted to buy back its shares from:

a) the existing security holders on a on a proportionate basis through the tender offer,

b) the open market through stock exchanges, and book building process; and

c) shareholders holding odd lot shares.

The regulations provide for extensive disclosures in the explanatory statement to be annexed to the notice for the general meeting and the letter of offer. The company has to disclose the pre and post-buy back holdings of the promoters. With a view to ensure completion of the buy back process speedily, the regulations provide for time bound steps in every mode.

For example, as per the offer procedure prescribed under Regulation 10 an offer for buy back shall not remain open for more than 30 days and the verification of shares received in buy back has to be completed within 15 days of the closure of the offer. The payments for accepted securities has to be made within 7 days of the completion of verification and bought back shares have to be extinguished and physically destroyed within 7 days of the date of the payment.

To ensure security for performance of its obligation, the company making an offer for buy back will have to open an escrow account.

Price Bands

Stock market volatility is generally a cause of concern for both policy makers as well as investors. To curb excessive volatility, SEBI has prescribed a system of price bands. The price bands or circuit breakers bring about a coordinated trading halt in all equity and equity derivatives markets nation-wide. An index-based market-wide circuit breaker system at three stages of the index movement either way at 10%, 15% and 20% has been prescribed. The breakers are triggered by movement of either S&P CNX Nifty or Sensex, whichever is breached earlier (please see chapter 5 for details). As an additional measure of safety, individual scrip-wise price bands have been fixed as below:

- Daily price bands of 2% (either way) on securities as specified by the Exchange.
- Daily price bands of 5% (either way) on securities as specified by the Exchange.
- Daily price bands of 10% (either way) on securities as specified by the Exchange.
- No price bands are applicable on: scrips on which derivative products are available or scrips included in indices on which derivative products are available. In order to prevent members from entering orders at non-genuine prices in such securities, the Exchange has fixed operating range of 20% for such securities.
- Price bands of 20% (either way) on all remaining scrips (including debentures, warrants, preference shares etc).

The price bands for the securities in the Limited Physical Market are the same as those applicable for the securities in the Normal Market. For auction market the price bands of 20% are applicable. There are no price bands for those securities which are available for trading in the Futures and Options segment and securities which form part of the indices on which trading is available in the Futures and Options segment.

3.4 Clearing and Settlement

3.4.1 Clearing and Settlement Mechanism

Introduction

The clearing and settlement mechanism in Indian securities market has witnessed several innovations. These include use of the state-of-art information technology, compression of settlement cycle, dematerialisation and electronic transfer of securities, securities lending and borrowing, professionalisation of trading members, fine-tuned risk management system, emergence of clearing corporations to assume counterparty risk etc.

The stock exchanges in India were following a system of account period settlement for cash market transactions and then the T+2 rolling settlement was introduced for all securities. The members receive the funds/securities in accordance with the pay-in/pay-out schedules notified by the respective exchanges.

Given the growing volume of trades and market volatility, the time gap between trading and settlement gives rise to settlement risk. In recognition of this, the exchanges and their clearing corporations employ risk management practices to ensure timely settlement of trades. The regulators have also prescribed elaborate margining and capital adequacy standards to secure market integrity and protect the interests of investors.

The trades are settled irrespective of default by a member and the exchange follows up with the defaulting member subsequently for recovery of his dues to the exchange. Due to setting up of the Clearing Corporation, the market has full confidence that settlements will take place on time and will be completed irrespective of possible default by isolated trading members. Movement of securities has become almost instantaneous in the dematerialised environment.

Two depositories viz., National Securities Depositories Ltd. (NSDL) and Central Depositories Services Ltd. (CDSL) provide electronic transfer of securities and more than 99% of turnover is settled in dematerialised form.

All actively traded scrips are held, traded and settled in demat form. The obligations of members are downloaded to members/custodians by the clearing agency. The members/custodians make available the required securities in their pool accounts with depository participants (DPs) by the prescribed pay-in time for securities. The depository transfers the securities from the pool accounts of members/custodians to the settlement account of the clearing agency. As per the schedule determined by the clearing agency, the securities are transferred on the pay-out day by the depository from the settlement account of the clearing agency to the pool accounts of members/custodians. The pay-in and pay-out of securities is effected on the same day for all settlements. Select banks have been empanelled by clearing agency for electronic transfer of funds. The members are required to maintain accounts with any of these banks.

The members are informed electronically of their pay-in obligations of funds. The members make available required funds in their accounts with clearing banks by the prescribed pay-in day. The clearing agency forwards funds obligations file to clearing banks which, in turn, debit the accounts of members and credit the account of the clearing agency.

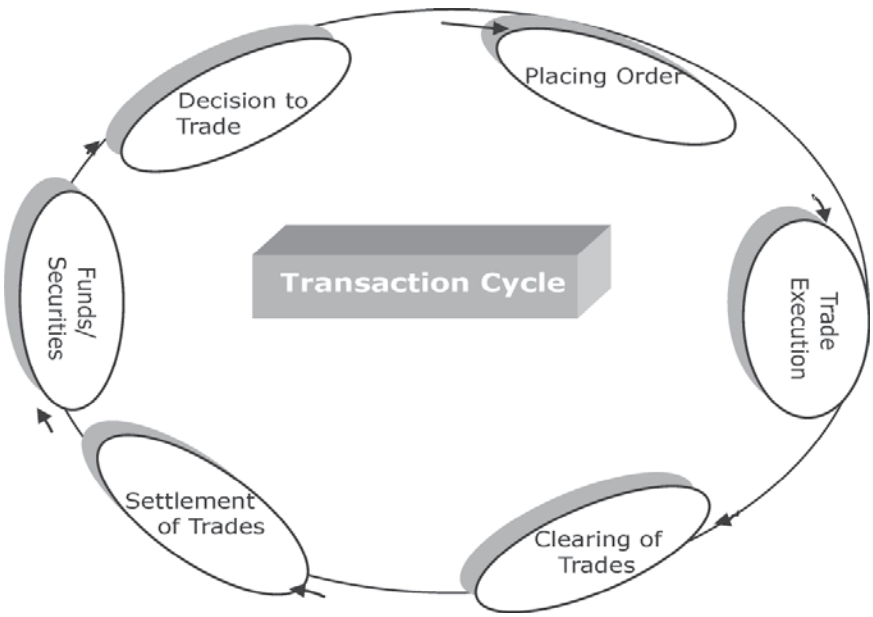
In some cases, the clearing agency runs an electronic file to debit members' accounts with clearing banks and credit its own account. On pay-out day, the funds are transferred by the clearing banks from the account of the clearing agency to the accounts of members as per the member's obligations. In the T+2 rolling settlement, the pay-in and pay-out of funds as well as securities take place 2 working days after the trade date.

Transaction Cycle

A person holding assets (securities/funds), either to meet his liquidity needs or to reshuffle his holdings in response to changes in his perception about risk and return of the assets, decides to buy or sell the securities. He finds out the right broker and instructs him to place buy/sell order on an exchange.

The order is converted to a trade as soon as it finds a matching sell/buy order. The trades are cleared to determine the obligations of counterparties to deliver securities/funds as per settlement schedule. Buyer/seller delivers funds/securities and receives securities/ funds and acquires ownership over them. A securities transaction cycle is presented in Figure 3.2

Figure 3.2: Transaction cycle



Settlement Process

While NSE provides a platform for trading to its trading members, the National Securities Clearing Corporation Ltd. (NSCCL) determines the funds/securities obligations of the trading members and ensures that trading members meet their obligations. NSCCL becomes the legal counterparty to the net settlement obligations of every member. This principle is called `novation' and NSCCL is obligated to meet all settlement obligations, regardless of member defaults, without any discretion.

Once a member fails on any obligations, NSCCL immediately cuts off trading and initiates recovery. The clearing banks and depositories provide the necessary interface between the custodians/clearing members (who clear for the trading

members or their own transactions) for settlement of funds/securities obligations of trading members.

The core functions involved in the process are:

a) ***Trade Recording:*** The key details about the trades are recorded to provide basis for settlement. These details are automatically recorded in the electronic trading system of the exchanges.

b) ***Trade Confirmation:*** The counterparties to trade agree upon the terms of trade like security, quantity, price, and settlement date, but not the counterparty which is the NSCCL. The electronic system automatically generates confirmation by direct participants. The ultimate buyers/sellers of securities also affirm the terms, as the funds/securities would flow from them, although the direct participants are responsible for settlement of trade.

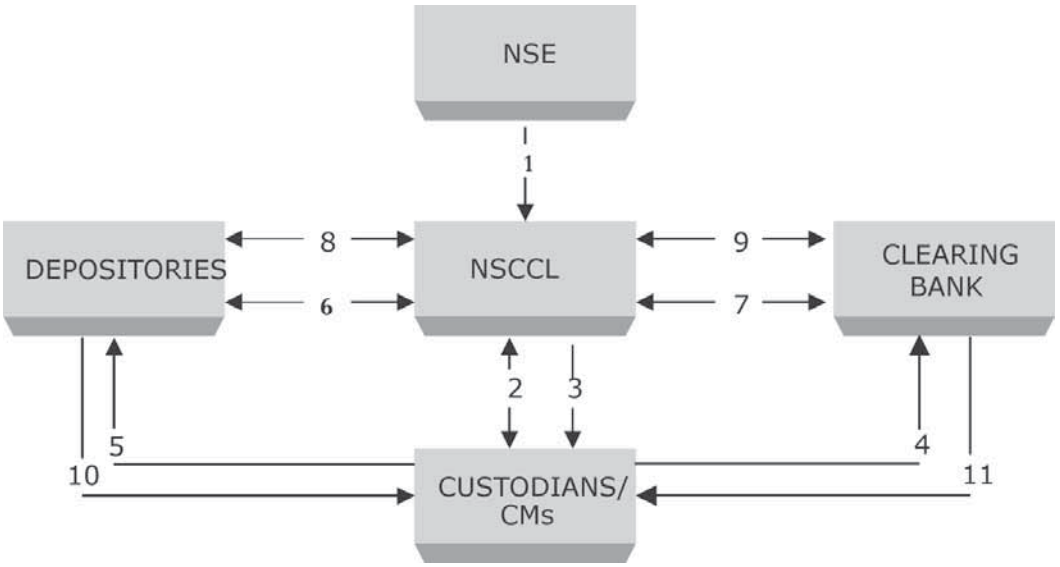
c) ***Determination of Obligation:*** The next step is determination of what counter-parties owe, and what counter-parties are due to receive on the settlement date. The NSCCL interposes itself as a central counterparty between the counterparties to trades and nets the positions so that a member has security wise net obligation to receive or deliver a security and has to either pay or receive funds.

d) ***Pay-in of Funds and Securities:*** The members bring in their funds/securities to the NSCCL. They make available required securities in designated accounts with the depositories by the prescribed pay-in time. The depositories move the securities available in the accounts of members to the account of the NSCCL. Likewise members with funds obligations make available required funds in the designated accounts with clearing banks by the prescribed pay-in time. The NSCCL sends electronic instructions to the clearing banks to debit member's accounts to the extent of payment obligations. The banks process these instructions, debit accounts of members and credit accounts of the NSCCL.

e) ***Pay-out of Funds and Securities*:** After processing for shortages of funds/securities and arranging for movement of funds from surplus banks to deficit banks through RBI clearing, the NSCCL sends electronic instructions to the depositories/clearing banks to release pay-out of securities/funds. The depositories and clearing banks debit accounts of the NSCCL and credit accounts of members. Settlement is complete upon release of pay-out of funds and securities to custodians/members. The settlement process for transactions in securities in the CM segment of NSE is presented in the Figure 3.3.

f) ***Risk Management:*** A sound risk management system is integral to an efficient settlement system. The NSCCL ensures that trading members' obligations are commensurate with their net worth. It has put in place a comprehensive risk management system, which is constantly monitored and upgraded to pre-empt market failures. It monitors the track record and performance of members and their net worth; undertakes on-line monitoring of members' positions and exposure in the market, collects margins from members and automatically disables members if the limits are breached.

Figure 3.3: Settlement Process in CM segment of NSE



Explanations:

(1) Trade details from Exchange to NSCCL (real-time and end of day trade file).

(2) NSCCL notifies the consummated trade details to CMs/custodians who affirm back. Based on the affirmation, NSCCL applies multilateral netting and determines obligations.

(3) Download of obligation and pay-in advice of funds/securities.

(4) Instructions to clearing banks to make funds available by pay-in time.

(5) Instructions to depositories to make securities available by pay-in-time.

(6) Pay-in of securities (NSCCL advises depository to debit pool account of custodians/CMs and credit its account and depository does it).

(7) Pay-in of funds (NSCCL advises Clearing Banks to debit account of custodians/CMs and credit its account and clearing bank does it).

(8) Pay-out of securities (NSCCL advises depository to credit pool account of custodians/CMs and debit its account and depository does it).

(9) Pay-out of funds (NSCCL advises Clearing Banks to credit account of custodians/CMs and debit its account and clearing bank does it).

(10) Depository informs custodians/CMs through DPs.

(11) Clearing Banks inform custodians/CMs.

Settlement Agencies

The NSCCL, with the help of clearing members, custodians, clearing banks and depositories settles the trades executed on exchanges. The roles of each of these entities are explained below:

(a) ***NSCCL*****:** The NSCCL is responsible for post-trade activities of a stock exchange. Clearing and settlement of trades and risk management are its central functions. It clears all trades, determines obligations of members, arranges for pay-in of funds/securities, receives funds/securities, processes for shortages in funds/securities, arranges for pay-out of funds/securities to members, guarantees settlement, and collects and maintains margins/collateral/base capital/other funds.

(b) ***Clearing Members*****:** They are responsible for settling their obligations as determined by the NSCCL. They have to make available funds and/or securities in the designated accounts with clearing bank/depositories, as the case may be, to meet their obligations on the settlement day. In the capital market segment, all trading members of the Exchange are required to become the Clearing Member of the Clearing Corporation.

(c) ***Custodians****:* Custodian is a clearing member but not a trading member. He settles trades assigned to him by trading members. He is required to confirm whether he is going to settle a particular trade or not. If it is confirmed, the NSCCL assigns that obligation to that custodian and the custodian is required to settle it on the settlement day. If the custodian rejects the trade, the obligation is assigned back to the trading / clearing member.

(d) ***Clearing Banks*****:** Clearing banks are a key link between the clearing members and NSCCL for funds settlement. Every clearing member is required to open a dedicated clearing account with one of the clearing banks. Based on his obligation as determined through clearing, the clearing member makes funds available in the clearing account for the pay-in and receives funds in case of a pay-out.

(e) ***Depositories*****:** Depositories help in the settlement of the dematerialised securities. Each custodian/clearing member is required to maintain a clearing pool account with the depositories. He is required to make available the required securities in the designated account on settlement day. The depository runs an electronic file to transfer the securities from accounts of the custodians/clearing member to that of NSCCL. As per the schedule of allocation of securities determined by the NSCCL, the depositories transfer the securities on the pay-out day from the account of the NSCCL to those of members/custodians.

(f) ***Professional Clearing Member*****:** NSCCL admits special category of members namely, professional clearing members. Professional Clearing Member (PCM) may clear and settle trades executed for their clients (individuals, institutions etc.). In such an event, the functions and responsibilities of the PCM would be similar to Custodians. PCMs may also undertake clearing and settlement responsibility for trading members. In such a case, the PCM would settle the trades carried out by the trading members connected to them. The onus for settling the trade would be thus on the PCM and not the trading

member. A PCM has no trading rights but has only clearing rights, i.e. he just clears the trades of his associate trading members and institutional clients.

Risks in Settlement

The following two kinds of risks are inherent in a settlement system:

***(1) Counterparty Risk*:** This arises if parties do not discharge their obligations fully when due or at any time thereafter. This has two components, namely replacement cost risk prior to settlement and principal risk during settlement.

(a) The *replacement cost risk* arises from the failure of one of the parties to transaction. While the non-defaulting party tries to replace the original transaction at current prices, he loses the profit that has accrued on the transaction between the date of original transaction and date of replacement transaction. The seller/buyer of the security loses this unrealised profit if the current price is below/above the transaction price. Both parties encounter this risk as prices are uncertain. It has been reduced by reducing time gap between transaction and settlement and by legally binding netting systems.

(b) The *principal risk* arises if a party discharges his obligations but the counterparty defaults. The seller/buyer of the security suffers this risk when he delivers/makes payment, but does not receive payment/delivery. This risk can be eliminated by delivery vs. payment mechanism which ensures delivery only against payment. This has been reduced by having a central counterparty (NSCCL) which becomes the buyer to every seller and the seller to every buyer.

(c) A variant of counterparty risk is *liquidity risk* which arises if one of the parties to transaction does not settle on the settlement date, but later. The seller/buyer who does not receive payment/delivery when due, may have to borrow funds/ securities to complete his payment/delivery obligations.

(d) Another variant is the *third party risk* which arises if the parties to trade are permitted or required to use the services of a third party which fails to perform. For example, the failure of a clearing bank which helps in payment can disrupt settlement. This risk is reduced by allowing parties to have accounts with multiple banks. Similarly, the users of custodial services face risk if the concerned custodian becomes insolvent, acts negligently etc.

***(2) System Risk*:** This comprises of operational, legal and systemic risks. The operational risk arises from possible operational failures such as errors, fraud, outages etc. The legal risk arises if the laws or regulations do not support enforcement of settlement obligations or are uncertain. Systemic risk arises when failure of one of the parties to discharge his obligations leads to failure by other parties. The domino effect of successive failures can cause a failure of the settle ment system. These risks have been contained

by enforcement of an elaborate margining and capital adequacy standards to secure market integrity, settlement guarantee funds to provide counter-party guarantee, legal backing for settlement activities and business continuity plan, etc.

3.4.2 Rolling Settlement

Introduction

Under rolling settlement, all trades executed on a trading day are settled X days later. This is called 'T+X' rolling settlement, where 'T' is the trade date and 'X' is the number of business days after trade date on which settlement takes place. The rolling settlement has started on T+2 basis in India, implying that the outstanding positions at the end of the day 'T' are compulsorily settled 2 days after the trade date.

Rolling settlement was first introduced in India by OTCEI. As dematerialisation took off, NSE provided an option to settle the trades in demat securities on rolling basis. In January 2000, SEBI made rolling settlement compulsory for trades in 10 scrips selected on the basis of the criteria that they were in the compulsory demat list and had daily turnover of about Rs.1 crore or more. This list, however, did not include scrips, which had carried forward trading facility. SEBI reviewed the progress of rolling settlement in February 2000. Consequent on the review, SEBI added a total of 156 scrips under rolling settlement. 74 companies, which had changed names to infotech companies, were included in compulsory rolling settlement from May 8, 2000. 31 NBFCs, which are listed and traded on the BSE, but whose applications for certificate of registration were rejected by RBI, were covered under compulsory rolling settlement from May 8, 2000. 17 scrips, which exhibited high volatility (i.e., of more than 110% for 7 weeks or more in the last 10 weeks) were also included in compulsory rolling settlement from May 8, 2000. In addition, 34 companies out of 199 companies, which were already included in compulsory demat trading for all investors and did not have carry forward facility in any of the exchanges and had signed agreements with both the depositories were included for compulsory rolling settlement from March 21, 2000.

Following Finance Minister's announcement on March 13, 2001 that the rolling settlement would be extended to 200 category 'A' stocks in MCFS (Modified Carried Forward System), ALBM (Automated Lending and Borrowing Mechanism) and BLESS (Borrowing and Lending Security Scheme) by July, 2001, SEBI decided that all 263 scrips included in the ALBM/BLESS or MCFS in any stock exchange or in the BSE-200 list would be traded only in the compulsory rolling settlement on all the exchanges from July 2, 2001. Further, SEBI mandated rolling settlement for the remaining securities from December 31, 2001. SEBI introduced T+5 rolling settlement in equity market from July 2001. Subsequently shortened the settlement cycle to T+3 from April 1, 2002. After having gained experience of T+3 rolling settlement and also taking further steps such as introduction of STP (Straight Through Processing), it was felt appropriate to further reduce the settlement cycle to T+2 thereby reducing the risk in the

market and to protect the interest of investors. As a result, SEBI, as a step towards easy flow of funds and securities, introduced T+2 rolling settlement in Indian equity market from 1st April 2003. The time schedule prescribed by SEBI for depositories and custodians for T+2 rolling settlement is as given in Table 3.5.

Table 3.5: Time schedule of Rolling Settlement:

S.No	Day	Time	Description of activity
1	T		Trade Day
2	T+1	By 1.00 pm	Confirmation of all trades (including custodial trades).
		By 2.30 pm	Processing and Downloading of obligation files to brokers/custodians
3	T+2	By 11.00 am	Pay-in of securities and funds
		By 1.30 pm	Pay-out of securities and funds

As per SEBI directive, the Custodians should adhere to the following activities for implementation of T+2 rolling settlement w.e.f. April 1, 2003:

1. Confirmation of the institutional trades by the custodians latest by 1.00 p.m. on T+1.

2. Pay-in to be made before 11:00 a.m. on T+2.

Rolling settlement offers several advantages over account period settlement:

(a) The account period settlement does not discriminate between an investor transacting on the first day and an investor transacting on the last day of the trading period, as trades are clubbed together for the purposes of settlement and all investors realise the securities and/or funds together. Hence some investors have to wait longer for settlement of their transactions. Under rolling settlement, the investors trading on a particular day are treated differently from the investors trading on the preceding or succeeding day. All of them wait for "X" days from the trade date for settlement. Further, the gap between the trade date and the settlement date is less under rolling settlement making both securities and funds easily convertible.

(b) The account period settlement combines the features of cash as well as futures markets and hence distorts price discovery process. In contrast, rolling settlement, which segregates cash and futures markets and thereby removes excessive speculation, helps in better price discovery.

(c) Account period settlement allows build up of large positions over a trading period of five days and consequently, there is a pressure to close them out on the last trading day, leading to significant market volatility. This does not happen under rolling settlement, where positions can be built during a day only.

(d) There is scope for both intra-settlement and intra-day speculation under account period settlement, which allows large outstanding positions and hence poses greater settlement

risks. In contrast, since all open positions under rolling settlement at the end of a date 'T' are necessarily settled 'X' working days later, it limits the outstanding positions and reduces settlement risk.

(e) Till recently, it was possible to shift positions from one exchange to another under account period as they follow different trading cycles. Rolling settlement took care of this by making trading cycle uniform.

Settlement Cycle

The NSCCL clears and settles trades as per well-defined settlement cycle. The settlement cycle for the CM segment of NSE is presented in Table 3.6. NSCCL notifies the consummated trade details to clearing members/custodians on the trade day. The custodians affirm back the trades to NSCCL by T+1 day. Based on the affirmation, NSCCL nets the positions of counterparties to determine their obligations. A clearing member has to pay-in/pay-out funds and/or securities.

A member has a security-wise net obligation to receive/deliver a security. The obligations are netted for a member across all securities to determine his fund obligations and he has to either pay or receive funds. Members' pay-in/pay-out obligations are determined latest by T+1 day and are forwarded to them on the same day so that they can settle their obligations on T+2 day. The securities/funds are paid-in/paid-out on T+2 days and the settlement is complete in 2 days from the end of the trade day.

Under Limited Physical Market segment, settlement for trades is done on a trade-for-trade basis and delivery obligations arise out of each trade. The settlement cycle for this segment is same as for the rolling settlement

Table 3.6: Settlement Cycle in CM Segment of NSE:

Activity	T+2 Rolling Settlement
Trading	T
Custodial Confirmation	T+1
Determination of Obligation	T+1
Securities/Funds Pay-in	T+2
Securities/Funds Pay-out	T+2
Valuation Debit	T+2
Auction	T+2
Auction Pay-in/Pay-out	T+3
Bad Delivery Reporting	T+4
Rectified Bad Delivery Pay-in/Pay-out	T+6
Re-bad Delivery Reporting	T+8
Close out of re-bad delivery and funds pay-in & pay-out	T+9

Pay-in and Pay-out of Funds

NSCCL offers Clearing Members the facility of settlement of funds obligations through 13 Clearing Banks, namely Axis Bank Ltd, Canara Bank, HDFC Bank, IndusInd Bank, ICICI Bank, Bank of India, IDBI Bank, Hongkong & Shanghai Banking Corporation Ltd., Kotak Mahindra Bank, Standard Chartered Bank, Union Bank of India, State Bank of India and Citibank N.A. Clearing Members are required to open clearing account with any one bank for the purpose of settlement of their transactions. They are also required to authorise their Clearing Bank to access their clearing account for debiting, crediting, reporting of balances and any other information in accordance with the advice received from NSCCL. Clearing accounts are used exclusively for clearing and settlement of transactions, i.e. for settling funds and other obligations to/ from the NSCCL, including payments of margins and penal charges. Clearing Banks debit/ credit the clearing account of clearing members as per instructions received from the NSCCL electronically.

Members are informed of their funds obligation for various settlements through the daily clearing data download. Members are also provided daily funds statement which gives date-wise details of each debit/ credit transaction in the member's clearing account. The summary statement provided to members summarises the debit/ credit information for a quick reference. Members can refer to these statements and provide for funds accordingly.

Member's account may be debited for various types of transactions on a daily basis. A member is required to ensure that adequate funds are available in the clearing accounts towards all obligations, by the scheduled date and time. It is possible that the total value of funds pay-in receivable by a bank is different from the value of funds payout from the bank i.e. the pay-in may be either more than the payout in a bank, or vice versa. In such cases, funds need to be transferred from the bank where there is excess pay-in to the bank where there is a shortage in pay-in. Based on estimated pay-in and pay-out of funds, on the day preceding the payout day, NSCCL advises the banks having pay-in in excess of pay-out to issue pay orders to the banks having pay-in less than the pay-out. The deficit banks accordingly get the funds to facilitate timely payout.

Shortfall of Funds Pay-in

Members are required to ensure that adequate funds are available in their clearing bank account towards all obligations, on the scheduled date and time. Based on current trends, settlement cycles, risk factors and other trade practices, in all cases of funds shortages, NSCCL may initiate various actions including withdrawing the trading facility of the member, withholding the securities pay-out due to the member, requiring the member to make advance pay-in, etc. as per the prescribed rules and regulations and circular instructions issued in this regard.

The above provisions shall apply if net cumulative fund shortage for a member is:

1. Equal to or greater than Rs. Five (5) lakhs at the end of pay-in.
2. Equal to or greater than Rs. Two (2) lakhs for six (6) or more occasions in the last three (3) months on any given day

In case, the member is disabled on account of (2) above, on making good the shortage amount, the member shall be permitted to trade subject to its providing a deposit equivalent to its cumulative funds shortage as the 'funds shortage collateral'. Such deposit shall be kept with the Clearing Corporation for a period of ten settlements and shall be released only if no further funds shortages are reported for the member in next ten consecutive settlements. Members may further note that there shall not be any margin benefit or any interest payment on the amount so deposited as 'funds shortage collateral'. The amount may be provided by way of cash, fixed deposit receipts, or bank guarantee, equivalent to the cumulative funds shortage.

In addition, the member will be required to pay a penal charge at the rate of 0.07% per day computed on the amount outstanding at the end of the day, till the amount is recovered.

However, the above actions are not constant and are subject to periodical review.

Pay-in and Pay-out of Securities

In order to settle trades in the dematerialised securities, a clearing member needs to open a clearing account with a depository participant (DP).

Clearing members are informed of their securities obligation for various settlements through the daily clearing data download and reports. Clearing members are also provided final delivery/ receipt statement and delivery details statement.

Before pay-in, selling investors instruct DP to transfer security balances from their beneficiary accounts to clearing member's pool account. At or before the time and day specified for pay-in by NSCCL, the clearing member instructs his DP to move the required balance from his pool account to his delivery account. On the pay-in day, the depository sends the balances to NSCCL at the scheduled time. The balances in respective clearing members' delivery accounts are first transferred to NSCCL's pool account which is then matched with the obligations generated by NSCCL system. The quantity and securities matched are accepted and credited to the pool account of the receiving clearing members through depository. The quantity and securities, not matched for any reason whatsoever, are not accepted and as such credited back to Pool Accounts of the delivering clearing members. On receipt of pay-out instructions from NSCCL, the depository credits the clearing members' pool accounts or clients beneficiary accounts in case of client direct payout instructions. From the pool accounts, the clearing members distribute the deliveries to the buying clients by issuing instructions to his DP.

3.5 Risk Management

A sound risk management system is integral to/pre-requisite for an efficient clearing and settlement system. The National Securities Clearing Corporation Ltd. (NSCCL), a wholly owned subsidiary of NSE, was incorporated in August 1995. It was set up to bring and sustain confidence in clearing and settlement of securities; to promote and maintain, short and consistent settlement cycles; to provide counter-party risk guarantee, and to operate a tight risk containment system. NSCCL commenced clearing operations in April 1996.

NSCCL ensures that trading members' obligations are commensurate with their net worth. In recognition of the fact that market integrity is the essence of any financial market and believing in the philosophy that prevention is better than cure, NSCCL has put in place a comprehensive risk management system which is constantly monitored and upgraded to pre-empt market failures.

Risk containment measures include capital adequacy requirements of members, monitoring of member performance and track record, stringent margin requirements, position limits based on capital, online monitoring of member positions and automatic disablement from trading when limits are breached.

To safeguard the interest of the investors, NSE administers an effective market surveillance system to curb excessive volatility, detect and prevent price manipulation and follows a system of price bands. Further, the exchange maintains strict surveillance over market activities in liquid and volatile securities.

3.5.1 Capital Adequacy Requirements

The core of the risk management is the liquid assets deposited by members with the exchange / clearing corporation. Members are required to provide liquid assets which adequately cover various margins & base minimum capital requirements. Liquid assets of the member include their Initial membership deposits including the security deposits. Members may provide additional collateral deposit towards liquid assets, over and above their minimum membership deposit requirements.

The acceptable forms of capital towards liquid assets and the applicable haircuts are listed below:

1. Cash Equivalents: Cash, Bank Fixed Deposits with approved custodians, Bank Guarantees from approved banks, Government Securities with 10% haircut, Units of liquid mutual funds or gilt funds with 10% haircut.
2. Other Liquid assets: (i) Liquid (Group I) Equity Shares in demat form, as specified by NSCCL from time to time deposited with approved Custodians. Haircuts applied are equivalent to the VaR margin for the respective securities (ii) Mutual fund units other than those listed under cash equivalents decided by NSCCL from time to time. Haircut

equivalent to the VaR margin for the units computed using the traded price if available, or else, using the NAV of the unit treating it as a liquid security.

Table3.7: Capital Adequacy Norms for Membership on NSE

(Rs. in lakh)

Particulars (all values in Rs. Lakh)	CM and F&O segment	CM, WDM and F&O segment
Net worth [1]	100	200
Interest free security deposit (IFSD) [2]	125	275
Collateral security deposit (CSD) [3]	25	25
Annual subscription	1	2

Note: (1) No additional networth is required for self-clearing members in F&O segment. However, networth of Rs. 300 lakh is required for members clearing for self as well as for other trading member.
(2) Additional Rs. 25 lakh is required for clearing membership. In addition, the clearing member is required to bring in IFSD of Rs. 2 lakh and CSD of Rs. 8 lakh per trading member in the F&O segment.

Additional Base Capital

Clearing members may provide additional base capital /collateral deposit (additional base capital) to NSCCL and/or may wish to retain deposits and/or such amounts which are receivable from NSCCL, over and above their minimum deposit requirements, towards initial margin and/or other obligations.

Clearing members may submit such deposits in any one form or combination of the following forms: (i) Cash (ii) Fixed Deposit Receipts with approved custodians (iii) Bank Guarantee from approved banks (iv) approved securities in demat form deposited with approved custodians.

Effective Deposits / Liquid Networth

Effective deposits

All collateral deposits made by CMs are segregated into cash component and non-cash component.

For Additional Capital, cash component means cash, bank guarantee, fixed deposit receipts, T-bills and dated government securities. Non-cash component shall mean all forms of collateral deposits like deposit of approved demand securities.

At least 50% of the Effective Deposits should be in the form of cash.

Liquid Networth

Liquid Networth is computed as total liquid assets less initial margin payable at any point in time.

The Liquid Networth maintained by CMs at any point in time should not be less than Rs.50 lakh (referred to as Minimum Liquid Net Worth).

3.5.2 Margins

Margins form a key part of the risk management system. In the stock markets there is always an uncertainty in the movement of share prices. This uncertainty leads to risk which is addressed by margining system of stock markets. Let us understand the concept of margins with the help of a following example.

Example: Suppose an investor, purchases 1000 shares of 'xyz' company at Rs.100/- on January 1, 2008. Investor has to give the purchase amount of Rs.1,00,000/- (1000 x 100) to his broker on or before January 2, 2008. Broker, in turn, has to give this money to stock exchange on January 3, 2008. There is always a small chance that the investor may not be able to bring the required money by required date. As an advance for buying the shares, investor is required to pay a portion of the total amount of Rs.1,00,000/- to the broker at the time of placing the buy order. Stock exchange in turn collects similar amount from the broker upon execution of the order. *This initial token payment is called margin.*

It is important to remember that for every buyer there is a seller and if the buyer does not bring the money, seller may not get his / her money and vice versa. Therefore, margin is levied on the seller also to ensure that he/she gives the 100 shares sold to the broker who in turn gives it to the stock exchange.

In the above example, assume that margin was 15%. That is investor has to give Rs.15,000/- (15% of Rs.1,00,000/) to the broker before buying. Now suppose that investor bought the shares at 11 am on January 1, 2008. Assume that by the end of the day price of the share falls by Rs.25/-. That is total value of the shares has come down to Rs.75,000/-. That is buyer has suffered a notional loss of Rs.25,000/-. In our example buyer has paid Rs.15,000/- as margin but the notional loss, because of fall in price, is Rs.25,000/-. That is notional loss is more than the margin given.

In such a situation, the buyer may not want to pay Rs.1,00,000/- for the shares whose value has come down to Rs.75,000/-. Similarly, if the price has gone up by Rs.25/-, the seller may not want to give the shares at Rs.1,00,000/-. To ensure that both buyers and sellers fulfill their obligations irrespective of price movements, notional losses are also need to be collected.

Prices of shares keep on moving every day. Margins ensure that buyers bring money and sellers bring shares to complete their obligations even though the prices have moved down or up.

IMPOSITION OF MARGINS

As per SEBI directives, the stocks are categorized as follows for imposition of margins:

- The Stocks which have traded atleast 80% of the days for the previous six months shall constitute the Group I (Liquid Securities) and Group II (Less Liquid Securities).
- Out of the scrips identified above, the scrips having mean impact cost of less than or equal to 1% shall be categorized under Group I and the scrips where the impact cost is more than 1, shall be categorized under Group II.
- The remaining stocks shall be classified into Group III (Illiquid Securities).
- The impact cost shall be calculated on the 15th of each month on a rolling basis considering the order book snapshots of the previous six months. On the basis of the impact cost so calculated, the scrips shall move from one group to another group from the 1st of the next month.
- For securities that have been listed for less than six months, the trading frequency and the impact cost shall be computed using the entire trading history of the security.
- For the first month and till the time of monthly review a newly listed security shall be categorised in that Group where the market capitalization of the newly listed security exceeds or equals the market capitalization of 80% of the securities in that particular group. Subsequently, after one month, whenever the next monthly review is carried out, the actual trading frequency and impact cost of the security shall be computed, to determine the liquidity categorization of the security.
- In case any corporate action results in a change in ISIN, then the securities bearing the new ISIN shall be treated as newly listed security for group categorization.

Daily margins payable by members consists of the following:

1. Value at Risk Margin
2. Extreme Loss Margin
3. Mark-To-Market Margin

Daily margin, comprising of the sum of VaR margin, Extreme Loss Margin and mark to market margin is payable.

Value at Risk Margin

VaR Margin is a margin intended to cover the largest loss that can be encountered on 99% of the days (99% Value at Risk). For liquid securities, the margin covers one-day losses while for illiquid securities, it covers three-day losses so as to allow the clearing corporation to liquidate the position over three days. This leads to a scaling factor of square root of three for illiquid securities.

For liquid securities, the VaR margins are based only on the volatility of the security while for other securities, the volatility of the market index is also used in the computation.

Computation of VaR Rate:

VaR is a single number, which encapsulates whole information about the risk in a portfolio. It measures potential loss from an unlikely adverse event in a normal market environment. It involves using historical data on market prices and rates, the current portfolio positions, and models (e.g., option models, bond models) for pricing those positions. These inputs are then combined in different ways, depending on the method, to derive an estimate of a particular percentile of the loss distribution, typically the 99th percentile loss.

The volatility is calculated as follows:

$$(\sigma_t)^2 = \lambda(\sigma_{t-1})^2 + (1-\lambda)(r_t)^2$$

σ^2 = is Variance

σ = standard deviation of daily returns

λ = is Lambda factor

r = Returns of the securities for the day

t = time

λ is a parameter which indicates how rapidly volatility estimate changes. The value of λ is fixed at 0.94 which has been arrived at on the basis of the empirical study done by Prof. J. R. Varma (F&O returns).

The 'return' is defined as the logarithmic return: $r_t = \ln(I_t/I_{t-1})$ where I_t is the security price at **time t.**

- **Security sigma** means the volatility of the security computed as at the end of the previous trading day. The volatility is computed as mentioned above
- **Security VaR** means the higher of 7.5% or 3.5 security sigmas.
- **Index sigma** means the daily volatility of the market index (S&P CNX Nifty or BSE Sensex) computed as at the end of the previous trading day.
- **Index VaR** means the higher of 5% or 3 index sigmas. The higher of the Sensex VaR or Nifty VaR would be used for this purpose.

The VaR Margins are specified as follows for different groups of securities:

Liquidity Categorization	One-Day VaR	Scaling factor for illiquidity	VaR Margin
Liquid Securities (Group I)	Security VaR	1.00	Security VaR
Less Liquid Securities (Group II)	Higher of Security VaR and three times Index VaR	1.73 (square root of 3.00)	Higher of 1.73 times Security VaR and 5.20 times Index VaR
Illiquid Securities (Group III)	Five times Index VaR	1.73 (square root of 3.00)	8.66 times Index VaR

VaR margin rate for a security constitutes the following:

1. Value at Risk (VaR) based margin, which is arrived at, based on the methods stated above. The index VaR, for the purpose, would be the higher of the daily Index VaR based on S&P CNX NIFTY or BSE SENSEX. The index VaR would be subject to a minimum of 5%.

2. Security specific Margin: NSCCL may stipulate security specific margins for the securities from time to time.

The VaR margin rate computed as mentioned above will be charged on the net outstanding position (buy value-sell value) of the respective clients on the respective securities across all open settlements. There would be no netting off of positions across different settlements. The net position at a client level for a member are arrived at and thereafter, it is grossed across all the clients including proprietary position to arrive at the gross open position.

For example, in case of a member, if client A has a buy position of 1000 in a security and client B has a sell position of 1000 in the same security, the net position of the member in the security would be taken as 2000. The buy position of client A and sell position of client B in the same security would not be netted. It would be summed up to arrive at the member's open position for the purpose of margin calculation.

The VaR margin shall be collected on an upfront basis by adjusting against the total liquid assets of the member at the time of trade.

The VaR margin so collected shall be released on completion of pay-in of the settlement.

Extreme Loss Margin

The Extreme Loss Margin for any security shall be higher of:

1. 5%, or

2. 1.5 times the standard deviation of daily logarithmic returns of the security price in the last six months. This computation shall be done at the end of each month by taking the price data on a rolling basis for the past six months and the resulting value shall be applicable for the next month.

Upfront margin rates (VaR Margin + Extreme Loss Margin) applicable for all securities in the Trade for Trade segment shall be 100%.

In view of market volatility, SEBI may direct stock exchanges to change the margins from time-to-time in order to ensure market safety and safeguard the interest of investors.

The Extreme Loss Margin shall be collected/ adjusted against the total liquid assets of the member on a real time basis.

The Extreme Loss Margin shall be collected on the gross open position of the member. The gross open position for this purpose would mean the gross of all net positions across all the clients of a member including its proprietary position.

There would be no netting off of positions across different settlements. The Extreme Loss Margin collected shall be released on completion of pay-in of the settlement.

Mark-to-Market Margin

Mark to market loss shall be calculated by marking each transaction in security to the closing price of the security at the end of trading. In case the security has not been traded on a particular day, the latest available closing price at the NSE shall be considered as the closing price. In case the net outstanding position in any security is nil, the difference between the buy and sell values shall be considered as notional loss for the purpose of calculating the mark-to-market margin payable.

MTM Profit/Loss = [(Total Buy Qty X Close price) – Total Buy Value] - [Total Sale Value - (Total Sale Qty X Close price)]

The mark to market margin (MTM) shall be collected from the member before the start of the trading of the next day.

The MTM margin shall also be collected/adjusted from/against the cash/cash equivalent component of the liquid net worth deposited with the Exchange.

Example 1:

A trading member has two clients with the following MTM positions. What will be the MTM for the trading member?

Client	Security X		Security Y		Security Z	
	T-1 Day	T Day	T-1 Day	T Day	T-1 Day	T Day
A	800	300	-500	-1200	0	0
B	1000	500	0	0	-1500	-800

The MTM for the trading member will be -1700.

The MTM margin shall be collected on the gross open position of the member. The gross open position for this purpose would mean the gross of all net positions across all the clients of a

member including its proprietary position. For this purpose, the position of a client would be netted across its various securities and the positions of all the clients of a broker would be grossed.

There would be no netting off of the positions and setoff against MTM profits across two rolling settlements i.e. T day and T-1 day. However, for computation of MTM profits/losses for the day, netting or setoff against MTM profits would be permitted.

Example 2:

A trading member has two clients with the following positions. What will be the gross open position for the member in X, Y and Z?

Client	Security	Settlement	Buy Value	Sell Value
Client A	Security X	2005001	1000	1100
	Security Y	2005002	3000	2550
Client B	Security X	2005001	4500	2400
	Security Z	2005002	7000	10450

The gross open position for the member in X, Y & Z will be 2200, 450, 3450 respectively.

In case of Trade for Trade Segment (TFT segment) each trade shall be marked to market based on the closing price of that security.

The MTM margin so collected shall be released on completion of pay-in of the settlement.

- Penalty applicable for margin violation shall be levied on a monthly basis based on slabs as mentioned below:

Instances of Disablement	Penalty to be levied
1st instance	0.07% per day
2nd to 5th instance of disablement	0.07% per day +Rs.5000/- per instance from 2nd to 5th instance
6th to 10th instance of disablement	0.07% per day+ Rs. 20000 (for 2nd to 5th instance) +Rs.10000/- per instance from 6th to 10th instance
11th instance onwards	0.07% per day +Rs. 70,000/- (for 2nd to 10th instance) +Rs.10000/- per instance from 11th instance onwards. Additionally, the member will be referred to the Disciplinary Action Committee for suitable action

Instances as mentioned above shall refer to all disablements during market hours in a calendar month.

- Penal charge of 0.07% per day shall be levied on the amount of margin shortage throughout the period of non-payment.

Institutional Transactions

Institutional businesses i.e., transactions done by all institutional investors are margined in the capital market segment from T+1 day subsequent to confirmation of the transactions by the custodians. For this purpose, institutional investors include

- Foreign Institutional Investors registered with SEBI. (FII)
- Mutual Funds registered with SEBI. (MF)
- Public Financial Institutions as defined under Section 4A of the Companies Act, 1956. (DFI)
- Banks, i.e., a banking company as defined under Section 5(1)(c) of the Banking Regulations Act, 1949. (BNK)
- Insurance companies registered with IRDA. (INS)
- Pension Funds regulated by Pension Fund Regulatory and Development Authority (PFRDA). (PNF)

Levy of margins:

- Institutional transactions are identified by the use of the participant code at the time of order entry.
- In respect of institutional transactions confirmed by the custodians the margins are levied on the custodians.
- In respect of institutional transactions rejected/not accepted by the custodians the margins are levied on the members who have executed the transactions.
- The margins are computed and levied at a client (Custodial Participant code) level in respect of institutional transactions and collected from the custodians/members.

Capping of margins

In case of a buy transaction, the VaR margins, Extreme loss margins and mark to market losses together shall not exceed the purchase value of the transaction. In case of a sale transaction, the VaR margins and Extreme loss margins together shall not exceed the sale value of the transaction and mark to market losses shall also be levied.

Exemption from margins:

- In cases where early pay-in of securities is made prior to the securities pay-in, such positions for which early pay-in (EPI) of securities is made shall be exempt from margins. The EPI would be allocated to clients having net deliverable position, on a random basis. However, members shall ensure to pass on appropriate early pay-in benefit of margin to the relevant clients.

- In cases where early pay-in of funds is made prior to the funds pay-in, such positions for which early pay-in (EPI) of funds is made shall be exempt from margins based on the client details provided by the member/ custodian. Early pay-in of funds specified by the member/custodians for a specific client and for a settlement shall be allocated against the securities in the descending order of the net buy value of outstanding position of the client.

Release of margins:

All margins collected for a settlement for a member/custodian *are* released on their individual completion of full obligations of funds and securities by the respective member/custodians after crystallization of the final obligations on T+1 day. Further, members are provided a facility to provide confirmation from their clearing banks towards their funds pay-in obligations on settlement day before prescribed pay-in time.

Retail Professional Clearing Member:

In case of transactions which are to be settled by Retail Professional Clearing Members (PCM), all the trades with PCM code shall be included in the trading member's positions till the same are confirmed by the PCM. Margins shall be collected from respective trading members until confirmation of trades by PCM.

On confirmation of trades by PCM, such trades will be reduced from the positions of trading member and included in the positions of PCM. The PCM shall then be liable to pay margins on the same.

Exemption upon early pay-in of securities

In cases where early pay-in of securities is made prior to the securities pay-in, such positions for which early pay-in (EPI) of securities is made shall be exempt from margins. The EPI of securities would be allocated to clients having net deliverable position, on a random basis unless specific client details are provided by the member/ custodian. However, member/ custodian shall ensure to pass on appropriate early pay-in benefit of margin to the relevant clients. Additionally, member/custodian can specify the clients to whom the early pay-in may be allocated.

Exemption upon early pay-in of funds

In cases where early pay-in of funds is made prior to the funds pay-in, such positions for which early pay-in (EPI) of funds is made shall be exempt from margins based on the client details provided by the member/ custodian. Early pay-in of funds specified by the member/ custodians for a specific client and for a settlement shall be allocated against the securities in the descending order of the net buy value of outstanding position of the client.

3.5.3 On-Line Exposure Monitoring

NSCCL has put in place an on-line monitoring and surveillance system whereby exposure of the members is monitored on a real time basis. A system of alerts has been built in so that both the member and NSCCL are alerted as per pre-set levels (reaching 70%, 85%, 90%, 95% and 100%) when the members approach their allowable limits. The system enables NSSCL to further check the micro-details of members' positions, if required and take pro-active action.

The on-line surveillance mechanism also generates various alerts/reports on any price/volume movement of securities not in line with past trends/patterns. For this purpose the exchange maintains various databases to generate alerts. Alerts are scrutinised and if necessary taken up for follow up action. Open positions of securities are also analysed. Besides this, rumors in the print media are tracked and where they are price sensitive, companies are contacted for verification. Replies received are informed to the members and the public.

3.5.4 Off-line Monitoring

Off-line surveillance activity consists of inspections and investigations. As per regulatory requirement, a minimum of 20% of the active trading members are to be inspected every year to verify the level of compliance with various rules, byelaws and regulations of the Exchange. Usually, inspection of more members than the regulatory requirement is undertaken every year. The inspection verifies if investor interests are being compromised in the conduct of business by the members.

The investigation is based on various alerts, which require further analysis. If further analysis reveals any suspicion of irregular activity which deviates from the past trends/patterns and concentration of trading at NSE at the member level, then a more detailed investigation is undertaken. If the detailed investigation establishes any irregular activity, then disciplinary action is initiated against the member. If the investigation suggests suspicions of possible irregular activity across exchanges and/or possible involvement of clients, then the same is informed to SEBI.

3.5.5 Index-based Market-wide Circuit Breakers/ Price Bands for Securities

An index based market-wide circuit breaker system applies at three stages of the index movement either way at 10%, 15% and 20%. These circuit breakers bring about a coordinated trading halt in trading on all equity and equity derivatives markets across the country. The breakers are triggered by movements in either Nifty 50 or Sensex, whichever is breached earlier.

- In case of a 10% movement in either of these indices, there would be a one-hour market halt if the movement takes place before 1:00 p.m. In case the movement takes place at or after 1:00 p.m. but before 2:30 p.m. there would be trading halt for ½ hour.

In case movement takes place at or after 2:30 p.m. there will be no trading halt at the 10% level and market would continue trading.

- In case of a 15% movement of either index, there should be a two-hour halt if the movement takes place before 1 p.m. If the 15% trigger is reached on or after 1:00 p.m. but before 2:00 p.m., there should be a one-hour halt. If the 15% trigger is reached on or after 2:00 p.m. the trading should halt for remainder of the day.
- In case of a 20% movement of the index, trading should be halted for the remainder of the day.

NSE may suo moto cancel the orders in the absence of any immediate confirmation from the members that these orders are genuine or for any other reason as it may deem fit. The Exchange views entries of non-genuine orders with utmost seriousness as this has market –wide repercussion. As an additional measure of safety, individual scrip-wise price bands have been fixed as below:

Daily price bands of 2% (either way) on a set of specified securities

Daily price bands of 5% (either way) on a set of specified securities

Daily price bands of 10% (either way) on a set of specified securities

Price bands of 20% (either way) on all the remaining securities (including debentures, warrants, preference shares etc. which are traded on CM segment of NSE),

No price bands are applicable on scrip on which derivative products are available or scrips included in indices on which derivative products are available. However in order to prevent members from entering orders at non-genuine prices in such securities, the Exchange has fixed operating range of 20% for such securities.

The price bands for the securities in the Limited Physical Market are the same as those applicable for the securities in the Normal Market. For Auction market the price bands of 20% are applicable.

3.5.6 Settlement Guarantee Mechanism

NSCCL assumes the counter party risk of each member and guarantees financial settlement. Counter party risk is guaranteed through a fine tuned risk management system and an innovative method of on-line position monitoring and automatic disablement. A large Settlement Guarantee Fund provides the cushion for any residual risk. In the event of failure of a trading member to meet settlement obligations or committing default, the Fund is utilized to the extent required for successful completion of the settlement. This has eliminated counter party risk of trading on the Exchange. The market has now full confidence that settlements will take place in time and will be completed irrespective of possible default by isolated trading members. The concept of guaranteed settlements has completely changed the way market safety is perceived.

The Settlement Guarantee Fund is an important element in facilitating the settlement process. The Fund operates like a self-insurance mechanism and is funded through the contributions made by trading members, transaction charges, penalty amounts, fines etc. recovered by NSCCL.

A part of the cash deposit and the entire security deposit of every clearing member with the Exchange has been converted into an initial contribution towards the Settlement Guarantee Fund, as indicated below:

Equity Segment

Type of Member	Cash Deposit (Rs. Lakh)	Security Deposit in the form of Bank FDR/ guarantee or securities (Rs. Lakh)
Individual/ partnership firms	6.00	17.50
Corporates	9.00	25.00

There is a provision that as and when volumes of business increase, members may be required to make additional contributions allowing the fund to grow alongwith the market volumes.

Direct Pay-out of Securities

NSCCL has put in place a system for giving direct pay-out of securities to investor's account. The system is applicable for both the depositories. The trading member/ clearing member indicates the beneficiary account to which the securities payout is to be made by way of file upload. In order to smoothen the back office work of the trading members for providing this information, NSCCL has provided a front end for creating the file through which the information is passed on to NSCCL. On the pay-out day, pay-out goes to such investors' account directly from NSCCL. In case of any wrong information provided by the trading member, the pay-out goes to the pool account of the trading member.

No-delivery Period

Whenever a book closure or a record date is announced by a company for corporate actions other than AGM, EGM, dividend & Bonus, the exchange sets up a 'no-delivery' period for that security. During this period, trading is permitted in the security. However, these trades are settled only after the no-delivery period is over. This is done to ensure that investor's entitlement for the corporate benefits is clearly determined.

Penalty

The Clearing Corporation levies penalties on trading members for non-compliances and defaults like:

1. Funds Shortages
2. Securities Shortages
3. Margin Shortages

4. Security Deposit Shortages
5. Client Code Modification
6. Non-acceptance / rejection / allocation of Institutional trades
7. Ineligible client in Inter-institutional deals
8. Others

1. Funds Shortages : Members failing to fulfill their funds obligations (all markets including the valuation debit raised on account of securities shortages) to Clearing Corporation shall be subjected to the following penalty structure:-

Type of Non-Fulfillment	Penalty Charge % per day
Value Rs. 5 lakhs or more	0.07
Value less than Rs. 5 lakhs	0.07

2. Securities Shortages in respect of cleared deals:- Members failing to fulfill their securities deliverable obligations to Clearing Corporation shall be subjected to the following penalty structure:-

Type of Non-Fulfillment	Penalty Charge % per day on value of shortage
Security Shortage	0.05

3. Margin Shortages : Penalty for violation on account of initial margin limit/exposure margin and/or open interest limit may be levied on a monthly basis based on slabs mentioned below:

Instances of Disablement	Penalty to be levied
1st instance	0.07% per day
2nd to 5th instance of disablement	0.07% per day +Rs.5000/- per instance from 2nd to 5th instance
6th to 10th instance of disablement	0.07% per day+ Rs. 20000 (for 2nd to 5th instance) +Rs.10000/- per instance from 6th to 10th instance
11th instance onwards	0.07% per day +Rs. 70,000/- (for 2nd to 10th instance) +Rs.10000/- per instance from 11th instance onwards. Additionally, the member will be referred to the Disciplinary Action Committee for suitable action

Instances as mentioned above shall refer to all disablements during market hours in a calendar month. The penal charge of 0.07% per day shall be applicable on all disablements due to margin violation anytime during the day.

4. Security deposit shortage: Penal charges for shortages in the minimum deposit requirement is 0.07% per day.

5. Client code modification: Penalties shall be imposed in respect of client code modifications in non-institutional orders only. The penalty structure is given below :

Percentage of modified client codes for non-institutional orders beyond the first 5 orders to total non-institutional orders (matched) on a daily basis	Amount (in Rs)
Less than or equal to 1%	NIL
Greater than 1% but less than or equal to 5%	500/- per day
Greater than 5% but less than or equal to 10%	1000/- per day
Greater than 10%	10000/- per day

6. **Non-acceptance / rejection / allocation of Institutional trades**: Penalty is imposed where the institutional trades are rejected / non-accepted by Custodians or not allocated by the trading members. A penalty at the rate of 0.10% of the total value of all such transactions for a settlement for a member or Rs.10,000/- whichever is lower.

7. **Ineligible client in Inter-institutional deals**: Clearing and settlement procedure for inter-institutional deals involves eligibility of clients. For sell orders only FIIs are permitted, for buy orders FIIs, DFIs, Banks, Mutual Funds and Insurance Companies and such other institutions as may be approved from time to time. Where RBI has stipulated collective limits for FIIs, NRIs, PIOs etc in certain securities, these entities shall be permitted to place orders on both buy and sell sides.

Penalties are imposed if trades are executed by ineligible clients as under:

- If the selling client is not eligible - the trade shall be compulsorily closed out and a penalty of Rs.25000 shall be imposed.
- If the buying client is not eligible - a penalty at the rate of 1% of the value of the trade or Rs 1 lakh whichever is lower shall be imposed.

8. **Others** :There are certain penalties imposed on members which are related to physical settlement :

1. **Failure to give Good Delivery:** In case of bad deliveries rectified, delayed good delivery processing charges will be at the rate of 0.09 % per day computed from the day on which securities were originally due to be brought in up to the day on which the securities are replaced/rectified.

   In case of bad deliveries not rectified, bad delivery processing charges will be @ 0.09% per day computed from the day on which securities were originally due to be brought in upto

   (i) the day on which the securities are brought in or

   (ii) till auction settlement is completed or

   (iii) where auction is partially successful or not successful and the deal is deemed closed out or

When the deal is squared off and the corresponding funds adjustments are completed, whichever is later.

In case of auction bad deliveries and rectified / replaced objection cases which are reported as bad delivery, the penal interest will be 0.09% per day from the rectification date till the date of closing out.

Type of Default	Charges
Wrong claims of dividend, bonus, interest etc.	Rs. 100/- per claim
Same set of shares reported twice under objection	10% of value of shares reported under objection subject to a minimum of Rs. 5,000/- per claim

2. **Incorrect claim for corporate benefits:**

Incorrect undertaking on form 6-I	10% of the value of shares reported under objection, subject to a minimum of Rs. 5,000/- per claim.

3. **Late withdrawal of company objection:** Processing fee for late withdrawal at the rate of Rs. 2 per share subject to a minimum of Rs.200/- shall be levied for all withdrawals where a member has not withdrawn the invalid/incorrect objection/ corporate benefits claim on the scheduled withdrawal date, for the following reasons:

   a. The shares under objection have not been introduced by the member on the Exchange, however he is not able to produce the delivery slip / delivery details statement on the scheduled withdrawal day.

   b. Where the Introducing Member (IM) had not approached the Clearing House on the scheduled withdrawal date on account of oversight/mistake.

Members wanting to avail 'late' withdrawals will be required to affix pre-paid coupons for the late withdrawal fee, at the time of reporting the same. Acceptance of such late withdrawals shall be subject to approval only.

4. **Trade for Trade**

S.No.	Types of default	Penalty Charge
a.	Non settlement of trade	0.5% of the trade value
b.	Cancellation of trade	Rs. 1000/- per trade per side
c.	Failure to settle within the stipulated time	Rs. 500/- per trade per day, subject to maximum of 2.50 times the value of the trade for each side with a ceiling of Rs. 10000/-
d.	Failure to report within the stipulated time	Rs. 500/- per trade per day subject to maximum of 2.50 times the value of the trade for each side with a ceiling of Rs. 5000/

Investigation and Inspection

As per regulatory requirement, a minimum of 20% of the active trading members are to be inspected every year to verify the level of compliance with various rules, byelaws and regulations of the Exchange. Usually, inspection of more members than the regulatory requirement is undertaken every year. The inspection randomly verifies if investor interests are being compromised in the conduct of business by the members. The investigation is based on various alerts which require further analysis. If further analysis suggests any possible irregular activity which deviates from the past trends/patterns and concentration of trading at NSE at the member level, then a more detailed investigation is undertaken. If the detailed investigation establishes any irregular activity, then disciplinary action is initiated against the member. If the investigation suggests possible irregular activity across exchanges and/or possible involvement of clients, then the same is informed to SEBI.

3.5.7 Investor Protection Fund

Investor Protection Fund (IPF) has been set up as a trust under Bombay Public Trust Act, 1950 under the name and style of National Stock Exchange Investor Protection Fund Trust and is administered by the Trustees. The IPF is maintained by NSE to make good investor claims, which may arise out of non-settlement of obligations by the trading member, who has been declared defaulter / expelled, in respect of trades executed on the Exchange. The IPF is utilised to settle claims of such investors where the trading member through whom the investor has dealt has been declared a defaulter or expelled by the Exchange. Payments out of the IPF may include claims arising on account of non payment of funds by the defaulter /expelled member or non receipt of securities purchased by the investor through the trading member who has been declared a defaulter/expelled member .

Quantum of Compensation: The maximum amount of claim payable from the IPF to the investor is Rs. 15 lakh.

Procedure for filing claims: A notice is published in widely circulated daily newspapers notifying the trading member who has been declared defaulter/expelled member. Claims against the defaulter/expelled member specified in the notice are required to be made, on or before three months from the date of such notice. The claimant is required to submit the requisite documents/details in substantiation of his claim. The admissibility of the claim is decided by the Defaulters' Committee which recommends the payment of the admissible amount out of the Investor Protection Fund in case of insufficient assets in respect of the defaulter /expelled member vesting in the Exchange. Both the Committee and the Trustees may at any time and from time to time require any person to produce and deliver any documents or statements of evidence necessary to support any claim made or necessary for the purpose of establishing his claim. In default of delivery of such documents, the Committee and the Trustees may disallow (wholly or partly) any claim made by him.

On recommendation by the Defaulters' Committee, the Trustees, if satisfied that the default on which the claim is founded was actually committed, may admit the claim and act accordingly. The Trustees have an absolute discretion as regards the mode and method of assessing the nature of the claims including their genuineness and at their discretion may accept, reject or partially grant or allow claims and make payment thereof subject to the limits mentioned above The Trustees in disallowing (whether wholly or partly) a claim for compensation shall serve notice of such disallowance on the claimant.

Transaction Costs

Liquidity to a large extent depends on transaction costs. Lower the transaction cost, the lower is the bid-ask spread and higher the volumes. SEBI released a Working Paper titled 'Trade Execution Cost of Equity Shares in India' in January 2002. The study has measured implicit (indirect) costs in terms of quoted spread (possible cost of trading in a stock) and effective bid-ask spread (actual cost incurred by an investor to execute a trade in a stock) and their behaviour in relation to volume traded, market capitalisation, volatility and market hour. The major findings of the study are as follows:

1. Effective spread is, by and large, lower than the quoted spread.
2. Market micro-structural changes appear to have influenced spread size.
3. The spread is inversely related to volume traded and market capitalisation and positively related to volatility (variance). Efforts to reduce volatility will also lead to reduction in bid-ask spread.
4. Speed and time of arrival of information in the market also affects trade cost. The spreads are very high at the open of market hours and they slowly taper off as trading progresses. An investor who postpones his decision to buy or sell towards close of trading saves more than 50% in terms of spread.
5. Spreads are mostly independent of quantity quoted and traded.

3.6 Market Index

Traditionally, indices have been used as benchmarks to monitor markets and judge performance. Modern indices were first proposed by two 19th century mathematicians: Etienne Laspeyres and Hermann Paasche. The grandfather of all equity indices is the Dow Jones Industrial Average which was first published in 1896; since then indices have come a long way - not only in their sophistication - but also in the variety.

There are three main types of indices, namely price index, quantity index and value index. The price index is most widely used. It measures changes in the levels of prices of products in the financial, commodities or any other markets from one period to another. The indices in financial markets measure changes in prices of securities like equities, debentures, government securities, etc. The most popular index in financial market is the stock (equity) index which

uses a set of stocks that are representative of the whole market, or a specified sector, to measure the change in overall behaviour of the markets or sector over a period of time.

A stock index is important for its use:

1. as the lead indicator of the performance of the overall economy or a sector of the economy: A good index tells us how much richer or poorer investors have become.
2. as a barometer for market behaviour: It is used to monitor and measure market movements, whether in real time, daily, or over decades, helping us to understand economic conditions and prospects.
3. as a benchmark for portfolio performance: A managed fund can communicate its objectives and target universe by stating which index or indices serve as the standard against which its performance should be judged.
4. as an underlying for derivatives like index futures and option. It also underpins products such as, exchange-traded funds, index funds etc. These index-related products form a several trillion dollar business and are used widely in investment, hedging and risk management.
5. as it supports research (for example, as benchmarks for evaluating trading rules, technical analysis systems and analysts' forecasts); risk measurement and management; and asset allocation.

In addition to the above functional use, a stock index reflects changing expectations of the market about future of the corporate sector. The index rises if the market expects the future to be better than previously expected and drops if the expectation about future becomes pessimistic.

Price of a stock moves for two reasons, namely, company specific development (product launch, closure of a factory, arrest of chief executive) and development affecting the general environment (nuclear bombs, election result, budget announcement), which affects the stock market as a whole. The stock index captures the second part, that is, impact of environmental change on the stock market as a whole. This is achieved by averaging which cancels out changes in prices of individual stocks.

3.6.1 Understanding the index number

An index is a summary measure that indicates changes in value(s) of a variable or a set of variables over a time or space. It is usually computed by finding the ratio of current values(s) to a reference (base) value(s) and multiplying the resulting number by 100 or 1000. For instance, a stock market index is a number that indicates the relative level of prices or value of securities in a market on a particular day compared with a base-day price or value figure, which is usually 100 or 1000.

Illustration: The values of a market portfolio at the close of trading on Day 1 and Day 2 are:

	Value of portfolio	**Index value**
DAY1 (base day)	Rs. 20,000	1000
Day 2	Rs. 30,000	1500

Assume that Day 1 is the base day and the value assigned to the base day index is 1000. On Day 2 the value of the portfolio has changed from Rs. 20,000 to Rs. 30,000, a 50% increase. The value of the index on Day 2 should reflect a corresponding 50% increase in market value.

Thus,

$$\text{Index on Day2} = \frac{Portfolio\ Value\ of\ Day2}{Portfolio Value\ of\ Base\ Day} * Index\ Value\ of\ Base\ Day$$

$$= \frac{Rs.\ 30{,}000}{Rs.\ 20{,}000} * 1000$$

$$= 1500$$

Day 2's index is 1500 as compared to the 1000 of day 1.

The above illustration only serves as an introduction to how an index is constructed. The daily computation of a stock index involves more complexity especially when there are changes in market capitalization of constituent stocks, e.g., rights offers, stock dividend etc.

Attributes of an index

A good stock market index should have the following attributes:

(a) ***Capturing behaviour of portfolios*****:** A good market index should accurately reflect the behaviour of the overall market as well as of different portfolios. This is achieved by diversification in such a manner that a portfolio is not vulnerable to any individual stock or industry risk. A well-diversified index is more representative of the market. However there are diminishing returns from diversification. There is very little gain by diversifying beyond a point. Including illiquid stocks, actually worsens the index since an illiquid stock does not reflect the current price behaviour of the market, its inclusion in index results in an index, which reflects, delayed or stale price behaviour rather than current price behaviour of the market. Thus a good index should include the stocks which best represent the universe.

(b) ***Including liquid stocks*****:** Liquidity is much more than reflected by trading frequency. It is about ability to transact at a price, which is very close to the current market price. For example, when the market price of a stock is at Rs.320, it will be considered liquid if one can buy some shares at around Rs.320.05 and sell at around Rs.319.95. A liquid

stock has very tight bid-ask spread. Impact cost is the most practical and operational definition of liquidity.

***(c) Maintaining professionally*:** An index is not a constant. It reflects he market dynamics and hence changes are essential to maintain its representative character. This necessarily means that the same set of stocks would not satisfy index criteria at all times. A good index methodology must therefore incorporate a steady pace of change in the index set. It is crucial that such changes are made at a steady pace. Therefore the index set should be reviewed on a regular basis and, if required, changes should be made to ensure that it continues to reflect the current state of market.

Methodology for index construction

WEIGHTING METHOD

In a value-weighted index, the weight of each constituent stock is proportional to its market share in terms of market capitalization. In an index portfolio, we can assume that the amount of money invested in each constituent stock is proportional to its percentage of the total value of all constituent stocks. Examples include all major stock market indices like S&P CNX Nifty.

There are three commonly used methods for constructing indices:

- Price weighted method
- Equally weighted method
- Market capitalisation weighted method

A price-weighted index is computed by summing up the prices, of the various securities included in the index, at time 1, and dividing it by the sum of prices of the securities at time 0 multiplied by base index value. Each stock is assigned a weight proportional to its price.

Example: Assuming base index = 1000, price weighted index consisting of 5 stocks tabulated below would be:

COMPANY	Share Price at Time- 0	Share Price at Time- 1
Reliance	351.75	340.50
AB & U	329.10	350.30
INFOSYS	274.60	280.40
HLL	1335.25	1428.75
Tata Tea	539.25	570.25
Total	**2829.95**	**2970.20**

$$\text{Index} = \frac{2970.20}{2829.95} * 1000 = 1049.56$$

An equally weighted index assigns equal weight to each stock. This is achieved by adding up the proportionate change in the price of each stock, dividing it by no of stocks in the index and multiplying by base index value.

Assuming base index = 1000, equally weighted index consisting of 5 stocks tabulated in the earlier example would be calculated as:

$$\text{Index} = \frac{\frac{340.50}{351.75}+\frac{350.30}{329.10}+\frac{280.40}{274.60}+\frac{1428.75}{1335.25}+\frac{570.25}{539.25}}{5} * 1000$$

$$= \frac{5.1810682}{5} * 1000 = 1036.21$$

Market capitalisation weighted index: The most commonly used weight is market capitalization (MC), that is, the number of outstanding shares multiplied by the share price at some specified time. In this method,

$$\text{Index} = \frac{Current\ Market\ Capitalization}{Base\ Market\ Capitalization} * Base\ Value$$

Where,

Current MC = Sum of (number of outstanding shares*Current Market Price) all stocks in the index

Base MC = Sum of (number of outstanding shares*Market Price) all stocks in index as on base date

Base value = 100 or 1000

Assuming base index = 1000, market capitalisation weighted index consisting of 5 stocks tabulated in the earlier example would be calculated as:

COMPANY	Current Market Capitalization (Rs. Lakh)	Base Market Capitalization (Rs. Lakh)
Reliance	1668791.10	1654247.50
AB & U	872686.30	860018.25
INFOSYS	1452587.65	1465218.80
HLL	2675613.30	2669339.55
Tata Tea	660887.75	662559.30
Total	**7330566.10**	**7311383.40**

$$\text{Index} = \frac{7330566.10}{7311383.40} * 1000 = 1002.62$$

Difficulties in index construction:

The major difficulties encountered in constructing an appropriate index are:

- deciding the number of stocks to be included in the index,
- selecting stocks to be included in the index,
- selecting appropriate weights, and
- selecting the base period and base value.

3.6.2 Understanding S&P CNX NIFTY

S&P CNX Nifty (Nifty), the most popular and widely used indicator of the stock market in the country, is a 50-stock index comprising the largest and the most liquid stocks from about 25 sectors in India. The index was introduced in 1995 by the National Stock Exchange (NSE) keeping in mind it would be used for modern applications such as index funds and index derivatives besides reflecting the stock market behaviour. NSE maintained it till July 1998, after which the ownership and management rights were transferred to India Index Services & Products Ltd. (IISL), a joint venture between NSE and CRISIL.

***Choice of index set size**:*

While trying to construct Nifty, a number of calculations were done to arrive at the ideal number of stocks. A simple index construction algorithm was implemented which did not pre-specify the size of the index set, but added and deleted stocks based on criteria of MC and liquidity. Ten index time-series (from 1990 to 1995) were generated by using various thresholds for addition and deletion of stocks from/into the index set. These index sets turned out to range from 69 to 182 stocks as of end-1995 indicating that the ideal number of stocks for the index could be somewhere in the range 69 to 182. For each of these ten index time-series, the correlation between the index time-series and thousands of randomly chosen portfolios was calculated. This gave a quantitative sense of how increasing the index set size helps improve the extent to which the index reflects the behaviour of the market. It was observed that the gain from increasing the number of stocks from 69 to 182 was quite insignificant. It was corroborated by the theory on portfolio diversification, which suggests that diversifying from 10 to 20 stocks results in considerable reductions in risk, while the gains from further diversification are smaller. An analysis of liquidity further suggested that the Indian market had comfortable liquidity of around 50 stocks. Beyond 50, the liquidity levels became increasingly lower. Hence the index set size of 50 stocks was chosen.

***Selection of stocks**:*

From early 1996 onwards, the eligibility criteria for inclusion of stocks in S&P CNX Nifty are based on the criteria of Market Capitalization (MC), liquidity and floating stock.

Market capitalisation: Stocks eligible for inclusion in Nifty must have a six monthly average market capitalisation of Rs.500 crore or more during the last six months.

Liquidity (Impact cost)**:** Liquidity can be measured in two ways: Traditionally liquidity is measured by volume and number of trades. The new international practice of measuring liquidity is in terms of impact cost. An ideal stock can be traded at its ruling market price. However practically, when one tries to buy a stock, one pays a price higher than the ruling price for purchase, or receives a price lower than the ruling price from sale, due to sufficient quantity not being available at the ruling price. This difference from the ruling price in percentage terms is the impact cost. It is defined as the percentage degradation suffered in the price for purchase or sale of a specified quantity of shares, when compared to the ideal price. It can be computed for each individual stock based on order book snapshots. It can also be computed for a market index based on the impact cost of constituent stocks, using their respective index weights. The impact cost of a market index is effectively the cost incurred when simultaneously placing market orders for all constituents of the index, in the proportion of their weights in the index. A highly liquid market index is one where the impact cost of buying or selling the entire index is low.

It is the percentage mark up suffered while buying / selling the desired quantity of a stock compared to its ideal price, that is, (best buy + best sell)/2.

Let us assume the order book for a stock looks as follows:

Buy		**Sell**	
Quantity	**Price**	**Quantity**	**Price**
1000	98	1000	99
2000	97	1500	100
1000	96	1000	101

To buy 1500 stocks,

$$\text{Ideal price} = \frac{99 + 98}{2} = 98.5$$

$$\text{Actual buy price} = \frac{1000 * 99 + 500 * 100}{1500} = 99.33$$

$$\text{Impact cost (For 1500 stocks)} = \frac{99.33 - 98.5 \ X \ 100}{98.5} = 0.84\%$$

Impact cost for sell can also be worked out. The impact cost criterion requires that the stocks traded for 85% of the trading days at an impact cost of less than 0.75% can be included in the index.

Base date and value*:*

The base date selected for S&P CNX Nifty index is the close of prices on November 3, 1995, which marks the completion of one year of operations of NSE's Capital Market segment. The base value of the index has been set at 1000.

S&P CNX Nifty has a historical time series dating back to January 1990. It is worth explaining the manner of calculation of the series. On 1st July 1990, BSE (the Stock Exchange, Bombay) data for the preceding six months was analysed to shortlist a set of stocks which had adequate liquidity. The top fifty companies were included in the index set, and the index time series was calculated for three months from 1st July 1990 to 30th September 1990. The index set was re-calculated afresh at this point (i.e. by dropping some low-liquidity or low MC stocks, and adding better alternatives), and this new index set was used for the next three months, and so on. This methodology avoided selection bias associated with the simple back-calculation, which generates higher returns in the back-calculated series than is really the case. This happens because the index set chosen today is likely to contain stocks, which have fared well in the recent past. Conversely, stocks that fared badly in the past are likely to have lower MC and hence not get included in today's index set. The historical time-series of Nifty truly reflects the behaviour of an index populated with the biggest 50 stocks, which have required levels of liquidity through out.

The constituents and the criteria for the selection judge the effectiveness of the index. Selection of the index set is based on the following criteria:

§ Liquidity (Impact Cost)

§ Floating Stock

§ Others

Liquidity (Impact Cost)

For inclusion in the index, the security should have traded at an average impact cost of 0.50% or less during the last six months for 90% of the observations for a basket size of Rs. 2 Crores.

Impact cost is cost of executing a transaction in a security in proportion to the weightage of its market capitalisation as against the index market capitalisation at any point of time. This is the percentage mark up suffered while buying / selling the desired quantity of a security compared to its ideal price (best buy + best sell) / 2

Floating Stock

Companies eligible for inclusion in S&P CNX Nifty should have atleast 10% floating stock. For this purpose, floating stock shall mean stocks which are not held by the promoters and associated entities (where identifiable) of such companies.

Others

a) A company which comes out with a IPO will be eligible for inclusion in the index, if it fulfills the normal eligibility criteria for the index like impact cost, market capitalisation and floating stock, for a 3 month period instead of a 6 month period.

b) Replacement of Stock from the Index:

A stock may be replaced from an index for the following reasons:

Compulsory changes like corporate actions, delisting etc. In such a scenario, the stock having largest market capitalization and satisfying other requirements related to liquidity, turnover and free float will be considered for inclusion.

When a better candidate is available in the replacement pool, which can replace the index stock i.e. the stock with the highest market capitalization in the replacement pool has at least twice the market capitalization of the index stock with the lowest market capitalization.

With respect to (2) above, a maximum of 10% of the index size (number of stocks in the index) may be changed in a calendar year. Changes carried out for (2) above are irrespective of changes, if any, carried out for (1) above.

From June 26, 2009, S&P CNX Nifty is computed using Free Float Market Capitalisation weighted method, wherein the level of index reflects the free float market capitalisation of all stocks in Index.

Index maintenance

An index is required to be maintained professionally to ensure that it continues to remain a consistent benchmark of the equity markets. This involves transparent policies for inclusion and exclusion of stocks in the index and for day-to-day tracking and giving effect to corporate actions on individual stocks. At IISL, an Index Policy Committee comprising of eminent professionals from mutual funds, broking houses, financial institutions, academicians etc. formulates policy and guidelines for management of the Indices. An Index Maintenance Sub-Committee, comprising of representatives from NSE, CRISIL, S&P and IISL takes all decisions on addition/ deletion of stocks in any Index and the day to day index maintenance.

On-line computation and dissemination*:*

The index is calculated afresh every time a trade takes place in an index stock. Hence, we often see days where there are more than 5,00,000 observations for Nifty. The index data base provides data relating to Open, High, Low, and Close values of index every day, the number of shares traded for each of the index stocks, the sum of value of the stocks traded of each of the index stocks, the sum of the MC of all the stocks in the index etc.

Nifty is calculated on-line and disseminated over trading terminals across the country. This is also disseminated on real-time basis to information vendors such as Bloomberg, Reuters etc.

3.6.3 India Index Services & Products Ltd. (IISL)

IISL is jointly promoted by NSE, the country's leading stock exchange and The Credit Rating and Information Services of India Ltd.(CRISIL), the leading credit rating agency in India. IISL has a licensing and marketing agreement with Standard & Poor's (S&P), the leading index services provider in the world.

S&P CNX Nifty, the most popular and widely used indicator of the stock market in India, is the owned and managed by IISL, which also maintains over 80 indices comprising broad based benchmark indices, sectoral indices and customised indices.

MODEL QUESTIONS

Ques:1 In which of the following market types Central Government securities are allowed to trade?

(a) Normal Market (b) Odd lot Market

(c) Auction Market (d) Retdebt Market

Correct Answer: (d)

Ques:2. Basket Trading allows the trader to _____.

(a) create offline order entry file for a selected portfolio

(b) buy/sell nifty stock

(c) only buy selected portfolio

(d) trade only on selected portfolio

Correct Answer: (a)

Ques:3 What is the prevailing price band for Nifty/derivative stocks?

(a) 10% (b) 15%

(c) 20% (d) No band

Correct Answer: (d)

Ques:3 The market price protection functionality_____.

(a) limits the risk of a market order within a pre-set percentage of the last traded price

(b) limits over all risk of the market

(c) protects the market from price fluctuations

(d) all of the above

Correct Answer: (a)

Ques:4. Auction price applicable is _____.

(a) previous day's close price (b) last trade price on that day

(c) that day's close price (d) previous day's last trade price

Correct Answer: (a)

Ques:5 A professional clearing member is _____.

(a) a trading and clearing member and is entitled to settle trades for clients/trading members

(b) a trading and clearing member and is not entitled to settle trades for client

(c) only a clearing member and can clear and settle trades for his clients

(d) none of the above

Correct answer: (c)

Ques:6 Custodial Trades are confirmed by the custodians on _____ day.

(a) T (b) T + 1

(c) T + 2 (d) none of the above

Correct answer: (b)

Ques:7 Delivery versus Payment (DVP) mechanism is ensured through:

(a) Pay-in first and Pay-out later,

(b) Pay-out first and Pay-in later,

(c) Pay-in and Pay-out simultaneously

(d) None of the above

Correct answer: (d)

CHAPTER 4: GOVERNMENT SECURITIES MARKET

4.1 Introduction to Indian Debt Markets

The debt market in India comprises of two main segments, *viz*., the government securities market and the corporate securities market. The market for government securities is the most dominant part of the debt market in terms of outstanding securities, market capitalisation, trading volume and number of participants. It sets benchmark for the rest of the market.

The short-term instruments in this segment are used by RBI as instrument of monetary policy. The main instruments in the government securities market are fixed rate bond, floating rate bonds, zero coupon bonds and inflation index bonds, partly paid securities, securities with embedded derivatives, treasury bills and the state government bonds. The corporate debt segment includes private corporate debt, bonds issued by public sector units (PSUs) and bonds issued by development financial institutions (DFIs). This segment is not very deep and liquid. The market for debt derivatives has not yet developed appreciably.

The government securities market has witnessed significant transformation in the 1990s in terms of market design. The most significant developments include introduction of auction-based price determination for government securities, development of new instruments and mechanisms for government borrowing as well as participation by new market participants, increase in information dissemination on market borrowings and secondary market transactions, screen based negotiations for trading, and the development of the yield curve for government securities for marking-to-market portfolios of banks. During the last one decade, RBI introduced the system of primary dealers (PDs) and satellite dealers (since discontinued from December 2002), introduced delivery *versus* payment (D*v*P) in securities settlement, expanded the number of players in the market with facility for non-competitive bidding in auctions, and allowed wider participation in constituent Subsidiary General Ledger (SGL) accounts. The government securities market also benefited from emergence of liquidity arrangement through the Liquidity Adjustment Facility (LAF), expansion of the repo markets, complete stoppage of automatic monetisation of deficits, and emergence of self regulatory bodies, such as, the Primary Dealers Association of India (PDAI) and the Fixed Income Money Markets and Derivatives Association (FIMMDA).Continuous reforms in the G- Sec market are being undertaken for improving market design and liquidity.

To enhance liquidity and efficiency, some important initiatives have been taken such as: (i) introduction of repo/reverse repo operations in government securities to facilitate participants of manage short term liquidity mismatches (ii) operationalisation of Negotiated Dealing system (NDS), an automated electronic trading platform (c) establishment of Clearing Corporation of India Ltd. (CCIL) for providing an efficient and guaranteed settlement platform (d) introduction

of G-secs in stock exchanges (e) introduction of Real time Gross Settlement System (RTGS) which addresses settlement risk and facilitates liquidity management, (g) adoption of a modified Delivery-versus-Payment mode of settlement which provides for net settlement of both funds and securities legs and (h) announcement of an indicative auction calendar for Treasury Bills and Dated Securities.

Several initiatives have been taken to widen the investor base for government securities. To enable small and medium sized investors to participate in the primary auction of government securities, a 'Scheme of Non Competitive Bidding' was introduced in January 2002, this scheme is open to any person including firms, companies, corporate bodies, institutions, provident funds and any other entity prescribed by RBI.

In order to provide banks and other institutions with a more efficient trading platform, an anonymous order matching trading platform (NDS-OM) was made operational from August 1, 2005.

To provide an opportunity to market participants to manage their interest rate risk more effectively and to improve liquidity in the secondary market, short sales was permitted in dated government securities during 2006. 'When Issued' (WI) trading in Central government securities was also introduced in 2006. WI trades are essentially forward transactions in a security which is still to be issued.

The settlement system for transactions in government securities was standardized to T+1 cycle with a view to provide the participants with more processing time at their disposal and therefore, to enable better management of both funds as well as risk.

As a result of the gradual reform process undertaken over the years, the Indian G-Sec market has now become increasingly broad-based, characterised by an efficient auction process, an active secondary market and a fairly liquid yield curve up to 30 years. An active Primary Dealer (PD) system and electronic trading and settlement technology that ensure safe settlement with Straight Through Processing (STP) and central counterparty guarantee support the market now.

These reforms have resulted in a marked change in the nature of instruments offered, a wider investor base and a progressive movement towards market-determined interest rates. The market for government securities has, however, remained largely captive and wholesale in nature, with banks and institutions being the major investors in this segment. While the primary market for government securities witnessed huge activity due to increased borrowing needs of the government, only a small part of the outstanding stock finds its way into the secondary market.

The number of transactions in the secondary market continues to be small relative to the size of outstanding debt and the size of the participants. The liquidity continues to be thin despite a shift to screen-based trading on NSE. The holding of G-Secs among the financial institutions has been more diversified, particularly , with the emergence of insurance and pension funds

as a durable investor class for the long-term securities. This became possible due to the sustained efforts devoted to elongation of the maturity profile of government securities.

4.1.1 Market Subgroups

The various subgroups in debt market in India are discussed below:

- Government securities form the oldest and most dominant part of the debt market in India. The market for government securities comprises the securities issued by the central government, state governments and state-sponsored entities. In the recent past, local bodies such as municipal corporations have also begun to tap the debt market for funds. The Central Government mobilises funds mainly through issue of dated securities and T-bills, while State Governments rely solely on State Development Loans. The major investors in sovereign papers are banks, insurance companies and financial institutions, which generally do so to meet statutory requirements.
- Bonds issued by government-sponsored institutions like DFIs, infrastructure-related institutions and the PSUs, also constitute a major part of the debt market. The gradual withdrawal of budgetary support to PSUs by the government since 1991 has increased their reliance on the bond market for mobilising resources. The preferred mode of raising capital by these institutions has been private placement, barring an occasional public issue. Banks, financial institutions and other corporates have been the major subscribers to these issues.
- The Indian corporate sector relies, to a great extent, on raising capital through debt issues, which comprise of bonds and Commercial Papers (CPs). Of late, most of the bond issues are being placed through the private placement route. These bonds are structured to suit the requirements of investors and the issuers, and include a variety of tailor-made features with respect to interest payments and redemption. Corporate bond market has seen a lot of innovations, including securitised products, corporate bond strips, and a variety of floating rate instruments with floors and caps. In the recent years, there has been an increase in issuance of corporate bonds with embedded put and call options. While some of these securities are traded on the stock exchanges, the secondary market for corporate debt securities is yet to fully develop.
- In addition to above, there is another segment, which comprises of short-term paper issued by banks, mostly in the form of certificates of deposit (CDs). This segment is, however, comparatively less dominant.
- The Indian debt market also has a large non-securitised, transactions-based segment, where players are able to lend and borrow amongst themselves. This segment comprises of call and notice money markets, inter-bank market for term

money, market for inter-corporate loans, and market for ready forward deals (repos). Typically, short-term instruments are traded in this segment.

- The market for interest rate derivatives like FRAs, IRSs, and OISs (Overnight Index Swaps) is emerging to enable banks, PDs and FIs to hedge interest rate risks.

4.1.2 Instruments

Debt instruments represent contracts whereby one party lends money to another on pre-determined terms with regard to rate of interest to be paid by the borrower to the lender, the periodicity of such interest payment, and the repayment of the principal amount borrowed. In the Indian securities markets, we use the term 'bond' for debt instruments issued by the Central and State governments and public sector organisations, and the term 'debentures' for instruments issued by private corporate sector. In this workbook the terms bonds, debentures and debt instruments have been used inter-changeably.

The principal features of a bond are:

- **Maturity:** In the bond markets, the terms maturity and term-to-maturity, are used quite frequently. Maturity of a bond refers to the date on which the bond matures, or the date on which the borrower has agreed to repay (redeem) the principal amount to the lender. The borrowing is extinguished with redemption, and the bond ceases to exist after that date. Term to maturity, on the other hand, refers to the number of years remaining for the bond to mature. Term to maturity of a bond changes everyday, from the date of issue of the bond until its maturity.
- **Coupon:** Coupon refers to the periodic interest payments that are made by the borrower (who is also the issuer of the bond) to the lender (the subscriber of the bond). Coupon rate is the rate at which interest is paid, and is usually represented as a percentage of the par value of a bond.
- **Principal:** Principal is the amount that has been borrowed, and is also called the par value or face value of the bond. The coupon is the product of the principal and the coupon rate.

4.1.3 Participants

Debt markets are pre-dominantly wholesale markets, with institutional investors being major participants. Banks, financial institutions, mutual funds, provident funds, insurance companies and corporates are the main investors in debt markets. Many of these participants are also issuers of debt instruments. The small number of large players has resulted in the debt markets being fairly concentrated, and evolving into a wholesale negotiated dealings market. Most debt issues are privately placed or auctioned to the participants. Secondary market dealings are mostly done on telephone, through negotiations. In some segments, such as the government securities market, market makers in the form of primary dealers have emerged, which enable

a broader holding of treasury securities. Debt funds of the mutual fund industry, comprising of liquid funds, bond funds and gilt funds, represent a recent mode of intermediation of retail investments into the debt markets. The market participants in the debt market are described below:

(a) Central Government raises money through bond and T-bill issues to fund budgetary deficits and other short and long-term funding requirements.

(b) Reserve Bank of India (RBI), as investment banker to the government, raises funds for the government through dated securities and T-bill issues, and also participates in the market through open-market operations in the course of conduct of monetary policy. RBI also conducts daily repo and reverse repo to moderate money supply in the economy. RBI also regulates the bank rates and repo rates, and uses these rates as tools of its monetary policy. Changes in these benchmark rates directly impact debt markets and all participants in the market as other interest rates realign themselves with these changes.

(c) Primary Dealers (PDs), who are market intermediaries appointed by RBI, underwrite and make market in government securities by providing two-way quotes, and have access to the call and repo markets for funds. Their performance is assessed by RBI on the basis of their bidding commitments and the success ratio achieved at primary auctions. In the secondary market, their outright turnover has to three times their holdings in dated securities and five times their holdings in treasury bills. Satellite dealers constituted the second tier of market makers till December 2002.

(d) State governments, municipal and local bodies issue securities in the debt markets to fund their developmental projects as well as to finance their budgetary deficits.

(e) Public Sector Undertakings (PSUs) and their finance corporations are large issuers of debt securities. They raise funds to meet the long term and working capital needs. These corporations are also investors in bonds issued in the debt markets.

(f) Corporates issue short and long-term paper to meet their financial requirements. They are also investors in debt securities issued in the market.

(g) Development Financial Institutions (DFIs) regularly issue bonds for funding their financing requirements and working capital needs. They also invest in bonds issued by other entities in the debt markets. Most FIs hold government securities in their investment and trading portfolios.

(h) Banks are the largest investors in the debt markets, particularly the government securities market due to SLR requirements. They are also the main participants in the call money and overnight markets. Banks arrange CP issues of corporates and are active in the inter-bank term markets and repo markets for their short term funding

requirements. Banks also issue CDs and bonds in the debt markets. They also issue bonds to raise funds for their Tier-II capital requirement.

(i) The investment norms for insurance companies make them large participants in government securities market.

(j) Mutual funds have emerged as important players in the debt market, owing to the growing number of debt funds that have mobilised significant amounts from the investors. Most mutual funds also have specialised debt funds such as gilt funds and liquid funds. Mutual funds are not permitted to borrow funds, except for meeting very short-term liquidity requirements. Therefore, they participate in the debt markets pre-dominantly as investors, and trade on their portfolios quite regularly.

(k) Foreign Institutional Investors (FIIs) are permitted to invest in treasury and corporate bonds, within certain limits.

(l) Provident and pension funds are large investors in the debt markets. The prudential regulations governing the deployment of the funds mobilised by them mandate investments pre-dominantly in treasury and PSU bonds. They are, however, not very active traders in their portfolio, as they are not permitted to sell their holdings, unless they have a funding requirement that cannot be met through regular accruals and contributions.

(m) Charitable institutions, trusts and societies are also large investors in the debt markets. They are, however, governed by their rules and bye-laws with respect to the kind of bonds they can buy and the manner in which they can trade on their debt portfolios.

(n) Since January 2002, retail investors have been permitted submit non-competitive bids at primary auction through any bank or PD. They submit bids for amounts of Rs. 10,000 and multiples thereof, subject to the condition that a single bid does not exceed Rs. 1 crore. The non-competitive bids upto a maximum of 5% of the notified amount are accepted at the weighted average cut off price / yield.

(o) NDS, CCIL and WDM are other participants which are discussed in greater detail in subsequent sections.

The matrix of issuers, investors, instruments in the debt market and their maturities are presented in Table 4.1.

Table 4.1: Participants and Products in Debt Markets

Issuer	Instruments	Maturity	Investors
Central Government	Dated Securities	2 - 30 years	RBI, Banks, Insurance Companies, Provident Funds, Mutual Funds, PDs, Individuals.
Central Government	T-Bills	91/182/364 days	RBI, Banks, Insurance companies, Provident Funds, PDs, Mutual Funds, Individuals.
State Government	Dated Securities	5-13 years	Banks, Insurance Companies, Provident Funds, Individuals
PSUs	Bonds, Structured Obligations	5-10 years	Banks, Insurance Companies, Provident Funds, Mutual Funds, Individuals, Corporates.
Corporates	Debentures, Bonds	1 - 12 years	Banks. Mutual Funds, Corporates, Individuals.
Corporates, PDs	Commercial Papers	15 days to 1 year	Banks, Mutual Funds, Financial Institutions, Corporates, Individuals, FIIs
Scheduled Commercial Banks	Certificates of Deposits (CD)	15 days to 1 year	Banks, Corporations, Individuals, companies, trusts, funds, associations, FIs, non-resident Indians
Select Financial Institutions (under Umbrella Limit fixed RBI)		1 year to 10 years	
Scheduled Commercial Banks	Bank bonds	1-10 years	Corporations, Individuals, Companies, Trusts, Funds, Associations, FIs, non-resident Indians
PSU	Municipal bonds	0-7 Years	Banks, Corporations, Individuals, companies, trusts, funds, associations, FIs, non-resident Indians

4.2 Primary Market

4.2.1 Issuance Process-Government securities

The issue of government securities is governed by the terms and conditions specified in the general notification of the government and also the terms and conditions specified in the specific notification issued in respect of issue of each security. The terms and conditions specified in the general notification are discussed in this section.

Any person including firm, company, corporate body, institution, state government, provident fund, trust, NRI, OCB predominantly owned by NRIs and FII registered with SEBI and approved by RBI can submit offers, including in electronic form, for purchase of government securities.

Payment for the securities are made by the applicants on such dates as mentioned in the specific notification, by means of cash or cheque drawn on RBI or Banker's pay order or by authority to debit their current account with RBI or by Electronic Fund Transfer in a secured environment. Government securities are issued for a minimum amount of Rs.10,000/- (face value) and in multiples of Rs.10,000/- thereafter. These are issued to the investors by credit to their SGL account or to a Constituents' SGL account of the institution as specified by them, maintained with RBI or by credit to their Bond Ledger Account maintained with RBI or with any institution authorised by RBI, or in the form of physical certificate. These are repaid at Public Debt Offices of RBI or any other institution at which they are registered at the time of repayment. If specified in the specific notification, the payment for securities and the repayment thereof can be made in specified installments.

Government issues securities through the following modes:

(a) **Issue of securities through auction**: The securities are issued through auction either on price basis or on yield basis. Where the issue is on price basis, the coupon is pre-determined and the bidders quote price per Rs.100 face value of the security, at which they desire to purchase the security. Where the issue is on yield basis, the coupon of the security is decided in an auction and the security carries the same coupon till maturity. On the basis of the bids received, RBI determines the maximum rate of yield or the minimum offer price as the case may be at which offers for purchase of securities would be accepted at the auction.

The auctions for issue of securities (on either yield basis or price basis) are held either on 'Uniform price' method or on 'Multiple price' method. Where an auction is held on 'Uniform price' method, competitive bids offered with rates up to and including the maximum rate of yield or the prices up to and including the minimum offer price, as determined by RBI, are accepted at the maximum rate of yield or minimum offer price so determined. Bids quoted higher than the maximum rate of yield or lower than the minimum price are rejected. Where an auction is held on 'Multiple price' method, competitive bids offered at the maximum rate of yield or the minimum offer price, as determined by RBI, are accepted. Other bids tendered at lower than the maximum rate of yield or higher than the minimum offer price are accepted at the rate of yield or price as quoted in the respective bid. Bids quoted higher than the maximum rate of yield or lower than the minimum price are rejected.

Individuals and specified institutions (read 'retail investors') can participate in the auctions on 'non-competitive' basis. Allocation of the securities to non-competitive bidders are made at the discretion of RBI and at a price not higher than the weighted average price arrived at on the basis of the competitive bids accepted at the auction or any other price announced in the specific notification. The nominal amount of securities that would be allocated to retail investors on non-competitive basis is

restricted to a maximum 5 percentage of the aggregate nominal amount of the issue, within or outside the nominal amount which is issued at the weighted average price of the issue at the auction.

(b) **Issue of securities with pre-announced coupon rates**: The coupon on such securities is announced before the date of floatation and the securities are issued at par. In case the total subscription exceeds the aggregate amount offered for sale, RBI may make partial allotment to all the applicants.

(c) **Issue of securities through tap sale:** No aggregate amount is indicated in the notification in respect of the securities sold on tap. Sale of such securities may be extended to more than one day and the sale may be closed at any time on any day.

(d) **Issue of securities in conversion of maturing treasury bills/dated securities:** The holders of treasury bills of certain specified maturities and holders of specified dated securities are provided an option to convert their holding at specified prices into new securities offered for sale. The new securities could be issued on an auction/pre-announced coupon basis. RBI may participate in auctions as a 'non-competitor' or subscribe to the government securities in other issues. Allotment of securities to RBI are made at the cut off price/yield emerging in the auction or at any other price/yield decided by the government. In order to maintain a stable interest rate environment, RBI accepts private placement of government securities. Such privately placed securities and securities that devolve on RBI are subsequently offloaded through RBI's open market operations.

Government issues the following types of Government securities:

(a) **Securities with fixed coupon rates**: These securities carry a specific coupon rate remaining fixed during the term of the security and payable periodically. These may be issued at a discount, at par or at a premium to the face value and are redeemed at par.

(b) **Floating Rate Bonds**: These securities carry a coupon rate which varies according to the change in the base rate to which it is related. The description of the base rate and the manner in which the coupon rate is linked to it is announced in the specific notification. The coupon rate may be subject to a floor or cap.

(c) **Zero Coupon Bonds**: These are issued at a discount and redeemed at par. No interest payment is made on such bonds before maturity. On the basis of the bids received through tenders, RBI determines the cut-off price at which tenders for purchase such bonds would be accepted at the auction.

(d) **Securities with Embedded Derivatives**: These securities are repaid at the option of government/holder of the security, before the specified redemption date, where a

'call option'/'put option' is specified in the specific notification and repaid on the date of redemption specified in the specific notification, where neither a 'call option' nor a 'put option' is specified/ exercised.

(e) **Indexed Bond**: Interest payments of these bonds are based on Wholesale Price Index/ Consumer Price Index.

4.2.2 Issuance Process–Treasury Bills

Treasury bills (T-bills) are short-term debt instruments issued by the Central government. Three types of T-bills are issued: 91-day, 182-day and 364-day,

T-bills are sold through an auction process announced by the RBI at a discount to its face value. RBI issues a calendar of T-bill auctions. It also announces the exact dates of auction, the amount to be auctioned and payment dates. T-bills are available for a minimum amount of Rs. 25,000 and in multiples of Rs. 25,000. Banks and PDs are major bidders in the T-bill market. Both discriminatory and uniform price auction methods are used in issuance of T-bills. The auctions of all T-bills are multiple/discriminatory price auctions, where the successful bidders have to pay the prices they have actually bid for. Non-competitive bids, where bidders need not quote the rate of yield at which they desire to buy these T-bills, are also allowed from provident funds and other investors. RBI allots bids to the non-competitive bidders at the weighted average yield arrived at on the basis of the yields quoted by accepted competitive bids at the auction. Allocations to non-competitive bidders are outside the amount notified for sale. Non-competitive bidders therefore do not face any uncertainty in purchasing the desired amount of T-bills from the auctions.

Pursuant to the enactment of FRBM Act with effect from April 1, 2006, RBI is prohibited from participating in the primary market and hence devlovement on RBI is not allowed. Auction of all the Treasury Bills are based on multiple price auction method at present. The notified amounts of the auction is decided every year at the beginning of financial year (Rs.500 crore each for 91-day and 182-day Treasury Bills and Rs.1,000 crore for 364-day Treasury Bills for the year 2008-09) in consultation with GOI. RBI issues a Press Release detailing the notified amount and indicative calendar in the beginning of the financial year. The auction for MSS amount varies depending on prevailing market condition. Based on the requirement of GOI and prevailing market condition, the RBI has description to change the notified amount. Also, it is description of the RBI to accept, reject or partially accept the notified amount depending on prevailing market condition.

Cut-Off Yields

T-bills are issued at a discount and are redeemed at par. The implicit yield in the T-bill is the rate at which the issue price (which is the cut-off price in the auction) has to be compounded, for the number of days to maturity, to equal the maturity value.

Yield, given price, is computed using the formula:
= ((100-Price)*365)/ (Price * No of days to maturity)
Similarly, price can be computed, given yield, using the formula:
= 100/(1+(yield% * (No of days to maturity/365))
For example, a 182-day T-bill, auctioned on January 18, at a price of Rs. 95.510 would have an implicit yield of 9.4280% computed as follows:
= ((100-95.510)*365)/(95.510*182)

9.428% is the rate at which Rs. 95.510 will grow over 182 days, to yield Rs. 100 on maturity. Treasury bill cut-off yields in the auction represent the default-free money market rates in the economy, and are important benchmark rates.

4.2.3 Participants

Primary dealers (PDs) are important intermediaries in the government securities markets. There are 19 PDs operating in the market. They act as underwriters in the primary market for government securities, and as market makers in the secondary market. PDs underwrite a portion of the issue of government security that is floated for a pre-determined amount. Normally, PDs are collectively offered to underwrite up to 100% of the notified amount in respect of all issues where amounts are notified. The underwriting commitment of each PD is broadly decided on the basis of its size in terms of its net owned funds, its holding strength, the committed amount of bids and the volume of turnover in securities. Several facilities have been extended to PDs given their special role in the government debt market. RBI provides liquidity support to the PDs through LAF against collateral of government securities and through repo operations/refinance. PDs are also given favoured access to the RBI's open market operations. PDs are permitted to borrow and lend in the money market, including call money market. PDs can also raise funds through CPs and have access to finance from commercial banks as any other corporate borrower.

Satellite dealers (SDs) formed the second tier of trading and distribution of government securities. They were expected to further strengthen the infrastructure of distribution, enhance liquidity, provide a retail outlet and encourage holding among a wider investor base. They were given the facility of SGL, CSGL, current accounts, liquidity support through reverse repo, issue of CPs, etc. However, the Satellite Dealers Scheme was discontinued since December 2002.

4.3 Secondary Market

4.3.1 Trading of Government Securities on Stock Exchanges

With a view to encouraging wider participation of all classes of investors, including retail, trading in government securities through a nationwide, anonymous, order driven screen based trading system on stock exchanges and settlement through the depositories, in the

same manner in which trading takes place in equities, has been introduced with effect from January 16, 2003. Accordingly, trading of dated Government of India (GOI) securities in dematerialized form has started on automated order driven system of the National Stock Exchange (NSE), The Bombay Stock Exchange, Mumbai (BSE) and the Over the Counter Exchange of India (OTCEI). .

This trading facility is in addition to the reporting/trading facility in the Negotiated Dealing System. Being a parallel system, the trades concluded on the exchanges will be cleared by their respective clearing corporations/clearing houses. The trades of RBI regulated entities have to be settled either directly with clearing corporation/clearing house (in case they are clearing members) or else through clearing member custodian.

Primary Dealers (PDs) are expected to play an active role in providing liquidity to the government securities market and promote retailing. They may, therefore, make full use of proposed facility to distribute government securities to all categories of investors through the process of placing and picking-up orders on the exchanges.

PDs may open demat accounts with a Depository Participant (DP) of NSDL/CDSL in addition to their accounts with RBI. Value free transfer of securities between SGL/CSGL and demat accounts is enabled by PDO-Mumbai subject to operational guidelines being issued by our Department of Government and Bank Accounts (DGBA).

Operational Guidelines:

1. PDs should take specific approval from their Board of Directors to enable them to trade in the Stock Exchanges.
2. PDs may undertake transactions only on the basis of giving and taking delivery of securities.
3. Brokers/trading members shall not be involved in the settlement process; all trades have to be settled either directly with clearing corporation/clearing house (in case they are clearing members) or else through clearing member custodians.
4. The trades done through any single broker will also be subject to the current regulations on transactions done through brokers.
5. At the time of trade, securities must be available with the PDs either in their SGL or in the demat account.
6. A standardized settlement on T+1 basis of all outright secondary market transactions in Government Securities has been adopted to provide the participants more processing time for transactions and to help in better funds as well as risk management.
7. In the case of repo transactions in Government Securities, however, market participants will have the choice of settling the first leg on either T+0 basis or T+1 basis, as per their requirements.

8. Any settlement failure on account of non-delivery of securities/ non-availability of clear funds will be treated as SGL bouncing and the current penalties in respect of SGL transactions will be applicable. Stock Exchanges will report such failures to the respective Public Debt Offices.

9. PDs who are trading members of the Stock Exchanges may have to put up margins on behalf of their non-institutional client trades. Such margins are required to be collected from the respective clients. PDs are not permitted to pay up margins on behalf of their client trades and incur overnight credit exposure to their clients. In so far as the intra day exposures on clients for margins are concerned, the PDs should be conscious of the underlying risks in such exposures.

10. PDs who intend to offer clearing /custodial services should take specific approval from SEBI in this regard. Similarly, PDs who intend to take trading membership of the Stock Exchanges should satisfy the criteria laid down by SEBI and the Stock Exchanges.

Most of the secondary market trades in government securities are negotiated between participants (Banks, FIs, PDs, MFs) having SGL accounts with RBI. These may be negotiated directly between counter parties or negotiated through brokers. NDS of RBI provides an electronic platform for negotiating trades in government securities. If a broker is involved, the trade is reported to the concerned exchange. Trades are also executed on electronic platform of the WDM segment of NSE. WDM segment of NSE provides trading and reporting facilities for government securities.

4.3.2 Repo and Reverse Repo

Repo or Repurchase Agreements are short-term money market instruments. Repo is nothing but collateralized borrowing and lending through sale/purchase operations in debt instruments. Under a repo transaction, a holder of securities sells them to an investor with an agreement to repurchase at a predetermined date and rate. In a typical repo transaction, the counter-parties agree to exchange securities and cash, with a simultaneous agreement to reverse the transactions after a given period. To the lender of cash, the securities lent by the borrower serves as the collateral; to the lender of securities, the cash borrowed by the lender serves as the collateral. Repo thus represents a collateralized short term lending.

A reverse repo is the mirror image of a repo. When one is doing a repo, it is reverse repo for the other party. For, in a reverse repo, securities are acquired with a simultaneous commitment to resell.

Hence, whether a transaction is a repo or a reverse repo is determined only in terms of who initiated the first leg of the transaction. When the reverse repurchase transaction matures, the counter-party returns the security to the entity concerned and receives its cash along with a profit spread.

In a repo transaction, the securities should be sold in the first leg at market related prices and repurchased in second leg at derived price. The sale and repurchase should be accounted for in the repo account. On the other hand, in a reverse repo transaction, the securities should be purchased in the first leg at market related prices and sold in second leg at derived price. The purchase and sale should be accounted for in the reverse repo account.

Illustration:

Details of Repo in a coupon bearing security:

Security offered under Repo	11.43% 2015	
Coupon payment dates	7 August and 7 February	
Market Price of the security offered under Repo (i.e. price of the security in the first leg)	Rs.113.00	(1)
Date of the Repo	19 January, 2003	
Repo interest rate	7.75%	
Tenor of the repo	3 days	
Broken period interest for the first leg*	11.43%x162/360x100=5.1435	(2)
Cash consideration for the first leg	(1) + (2) = 118.1435	(3)
Repo interest**	118.1435x3/365x7.75%=0.0753	(4)
Broken period interest for the second leg	11.43% x 165/360x100=5.2388	(5)
Price for the second leg	(3)+(4)-(5) = 118.1435 + 0.0753 - 5.2388 = 112.98	(6)
Cash consideration for the second leg	(5)+(6) = 112.98 + 5.2388 = 118.2188	(7)

* Computation of days based on 30/360 day count convention

** Computation of days based on Actual/365 day count convention applicable to money market instruments

4.3.3 Negotiated Dealing System

The first step towards electronic bond trading in India was the introduction of the RBIs Negotiated Dealing System in February 2002.

NDS, interalia, facilitates screen based negotiated dealing for secondary market transactions in government securities and money market instruments, online reporting of transactions in the instruments available on the NDS and dissemination of trade information to the market. Government Securities (including T-bills), call money, notice/term money, repos in eligible securities are available for negotiated dealing through NDS among the members. NDS members concluding deals in the telephone market in instruments available on NDS, are required to report the deal on NDS system within 15 minutes of concluding the deal. NDS interfaces with CCIL for settlement of government securities transactions for both outright

and repo trades done/reported by NDS members. Other instruments viz, call money, notice/ term money, commercial paper and certificate of deposits settle as per existing settlement procedure.

With the objective of creating a broad-based and transparent market in government securities and thereby enhancing liquidity in the system, the NDS is designed to provide:

- Electronic bidding in primary market auctions (T-Bills, dated securities, state government securities) by members,
- Electronic bidding for OMO of RBI including repo auctions under LAF,
- Screen based negotiated dealing system for secondary market operations,
- Reporting of deals in government securities done among NDS members outside the system (over telephone or using brokers of exchanges) for settlement,
- Dissemination of trade information to NDS members,
- Countrywide access of NDS through INFINET,
- Electronic connectivity for settlement of trades in secondary market both for outright and repos either through CCIL or directly through RBI, and
- Creation and maintenance of basic data of instruments and members.

The functional scope of the NDS relating to trading includes:

- giving/receiving a Quote,
- placing a call and negotiation (with or without a reference to the quote),
- entering the deals successfully negotiated,
- setting up preferred counterparty list and exposure limits to the counterparties,
- dissemination of on-line market information such as the last traded prices of securities, volume of transactions, yield curve and information on live quotes,
- interface with Securities Settlement System for facilitating settlement of deals done in government securities and treasury bills.
- facility for reporting on trades executed through the exchanges for information dissemination and settlement in addition to deals done through NDS.

The system is designed to maintain anonymity of buyers and sellers from the market but only the vital information of a transaction viz., ISIN of the security, nomenclature, amount (face value), price/rate and/ or indicative yield, in case applicable, are disseminated to the market, through Market and Trade Watch.

The benefits of NDS include:

- Transparency of trades in money and government securities market,
- Electronic connectivity with securities settlement systems, thus, eliminating submission of physical SGL form,

- Settlement through electronic SGL transfer,
- Elimination of errors and discrepancies and delay inherent in manual processing system, and
- Electronic audit trail for better monitoring and control.

NDS was intended to be used principally for bidding in the primary auctions of G-secs conducted by RBI, and for trading and reporting of secondary market transactions. However, because of several technical problems and system inefficiencies, NDS was being used as a reporting platform for secondary market transactions and not as a dealing system. For actual transactions, its role was limited to placing bids in primary market auctions. Much of secondary market in the bond market continued to be broker intermediated.

It was therefore, decided to introduce a screen-based (i.e electronic) anonymous order matching system, integrated with NDS. This system **(NDS-OM)** has become operational with effect from August 1, 2005. While initially only banks and primary dealers could trade on it, NDS-OM has been gradually expanded to cover other institutional players like insurance companies, mutual funds, etc. Further, NDS-OM has been extended to cover all entities required by law or regulation to invest in Government securities such as deposit taking NBFCs, Provident Funds, Pension Funds, Mutual Funds, Insurance Companies, Cooperative Banks, Regional Rural Banks, Trusts, etc. The trades agreed on this system flow directly to CCIL for settlement.

The order matching system is a transparent, screen based and anonymous trading platform, Investors enter purchase/sale (bid and offer) orders on the system for individual securities they wish to deal in. The system ranks the orders in terms of prices and, for more than one order at the same price, in terms of timing of the orders (the earlier order gets priority). It then tries to match the sale orders with the purchase orders available on the system. When a match occurs, the trade is confirmed. The counterparties are not aware of each others identities- hence the anonymous nature of the system.

The NDS-OM has several advantages over the erstwhile telephone based market. It is faster, transparent, straight through processing, audits trails for transactions and cheaper. Straight through processing (STP) of transactions means that, for participants using CCILs clearing and settlement system, once a deal has been struck on NDS-OM, no further human intervention is necessary right upto settlement, thus eliminating possibilities human errors.

4.3.4 Wholesale Debt Market of NSE

The wholesale debt market (WDM) segment of NSE commenced operations on June 30, 1994 and provided the first formal screen-based trading facility for the debt market in the country. Initially, government securities, T-bills and bonds issued by PSUs were made available in this

segment. This range has been widened to include non-traditional instruments like floating rate bonds, zero coupon bonds, index bonds, CPs, CDs, corporate debentures, state government loans, SLR and non-SLR bonds issued by financial institutions, units of mutual funds and securitised debt. The WDM trading system, known as NEAT (National Exchange for Automated Trading), is a fully automated screen based trading system, which enables members across the country to trade simultaneously with enormous ease and efficiency. The trading system is an order driven system, which matches best buy and sell orders on a price/time priority.

Trading system provides two market sub-types: continuous market and negotiated market. In continuous market, the buyer and seller do not know each other and they put their best buy/sell orders, which are stored in order book with price/time priority. If orders match, it results into a trade. The trades in WDM segment are settled directly between the participants, who take an exposure to the settlement risk attached to any unknown counter-party. In the NEAT-WDM system, all participants can set up their counter-party exposure limits against all probable counter-parties. This enables the trading member/participant to reduce/minimise the counter-party risk associated with the counter-party to trade. A trade does not take place if both the buy/sell participants do not invoke the counter-party exposure limit in the trading system.

In the negotiated market, the trades are normally decided by the seller and the buyer outside the exchange, and reported to the Exchange through the broker. Thus, deals negotiated or structured outside the exchange are disclosed to the market through NEAT-WDM system. In negotiated market, as buyers and sellers know each other and have agreed to trade, no counter-party exposure limit needs to be invoked.

The trades on the WDM segment could be either outright trades or repo transactions with flexibility for varying days of settlement (T+0 to T+2) and repo periods (1 to 14 days). For every trade, it is necessary to specify the number of settlement days and the trade type (repo or non-repo), and in the event of a repo trade, the repo term.

The Exchange facilitates trading members to report off-market deals in securities in cases where the repo period is more than the permissible days in the trading system (14 days) or where the securities are not available for trading on the Exchange as they do not meet the listing requirements. These trades are required to be reported to the Exchange within 24 hours of the issuance of contract note.

Membership in NSE:

Membership of NSE-WDM segment is open to all persons desirous of becoming trading members, subject to meeting requirements/criteria as laid down by SEBI and the Exchange – Please refer to the chapter 3 for details.

***Listing**:*

All Government securities and Treasury bills are deemed to be listed automatically as and when they are issued. Other securities, issued publicly or placed privately, could be listed or admitted for trading, if eligible as per rules of the Exchange by following prescribed procedure:

1. All Listing are subject to compliance with Byelaws, Rules and other requirements framed by the Exchange from time to time in addition to the SEBI and other statutory requirements.
2. The Issuer of security proposed for listing has to forward an application in the prescribed format, which forms a part of the Listing Booklet.
3. Every issuer, depending on the category and type of security has to submit along with application, such supporting documents/information as stated in the Listing booklet and as prescribed by the Exchange from time to time.
4. On getting an in-principal consent of the exchange the issuer has to enter into a listing agreement in the prescribed format under its common seal.
5. Upon listing, the Issuer has to comply with all requirements of law, any guidelines/ directions of Central Government, other Statutory or local authority.
6. The Issuer shall also comply with the post listing compliance as laid out in the listing agreement and shall also comply with the rules, bye-laws, regulations and any other guidelines of the Exchange as amended from time to time.
7. Listing on WDM segment does not imply a listing on CM segment also or vice versa.
8. If the equity shares of an issuer are listed on other stock exchanges but not listed on Capital Market segment of the Exchange, though eligible, then the debt securities of the said issuer will not be permitted to be listed on the WDM segment.
9. The Exchange reserves the right to change any of the requirements indicated in the Listing booklet without prior notice.

Certain securities like Treasury Bills and other securities issued by Government of India available in demat form are eligible for Repo. Every security in the trading system is given a symbol representative of the security.

The market capitalisation of the securities on the WDM segment has been increasing steadily. The segment has also seen a marked increase in the number of securities available for trading other than the traditional instruments like Govt. securities and T-bills.

The listing requirements for securities on the WDM segment are presented in Table 4.2.

Table 4.2: Listing Criteria for Securities on WDM Segment

Issuer	Eligibility Criteria for listing	
	Public Issue /Private Placement	
Corporates (Public limited companies and Private limited companies)	• Paid-up capital of Rs.10 crores; or • Market capitalisation of Rs.25 crores (In case of unlisted companies Networth more than Rs.25 crores) • Credit rating	
Public Sector Undertaking, Statutory Corporation established/ constituted under Special Act of Parliament /State Legislature, Local bodies/authorities,	• Credit rating	
Mutual Funds: Units of any SEBI registered Mutual Fund/ scheme : • Investment objective to invest predominantly in debt or • Scheme is traded in secondary market as debt instrument	• Qualifies for listing under SEBI's Regulations	
Infrastructure companies • Tax exemption and recognition as infrastructure company under related statutes/regulations	• Qualifies for listing under the respective Acts, Rules or Regulations under which the securities are issued. • Credit rating	
Financial Institutions u/s. 4A of Companies Act, 1956 including Industrial Development Corporations	Public Issue	Private Placement
	Qualifies for listing under the respective Acts, Rules or Regulations under which the securities are issued.	Credit rating
Banks	• Scheme banks • Networth of Rs.50 crores or above • Qualifies for listing under the respective Acts, Rules or Regulations under which the securities are issued.	• Scheme Banks • Networth of Rs.50 crores or above • Credit rating

***Trading Mechanism**:*

The trades on the WDM segment can be executed in the Continuous or Negotiated market. In the continuous market, orders entered by the trading members are matched by the trading system on time price priority. For each order entering the trading system, the system scans for a probable match in the order books. On finding a match, a trade takes place. In case the order does not find a suitable counter order in the order books, it is stored in the order books as a passive order. This could later match with any future order entering the order book and result into a trade. This future order, which results in matching of an existing order, is called the active order. In the negotiated market, deals are negotiated outside the exchange between the two counter parties and are reported on the trading system for approval.

The WDM trading system recognises three types of users-Trader, Privileged and Inquiry. Trading Members can have all the three user types whereas Participants are allowed privileged

and inquiry users only. The user-id of a trader gives access for entering orders on the trading system. The privileged user has the exclusive right to set up counter party exposure limits. The Inquiry user can only view the market information and set up the market watch screen but cannot enter orders or set up exposure limits.

An Issuer shall ensure compliance with SEBI circulars/guidelines and any other law, guidelines/ directions of Central Government, other Statutory or local authority issued on regulating the listing of debt instruments from time to time.

The WDM supports two kinds of trades:

- Repo trades (RE), which are reversed after a specific term, allowed only in specified securities, and
- Non-Repo (NR) trades, which are for outright sales and purchase, allowed in all securities.

Trading in debt as outright trades or as 'repo' transactions can be for varying days of settlement and repo periods. For every security it is necessary to specify the number of settlement days (whether for same day settlement or T+1 etc. depending on what is permitted by the Exchange), the trade type (whether Repo or Non Repo), and in the event of a Repo trade, the Repo term. Order matching is carried out only between securities which carry the same conditions with respect to settlement days, trade type and repo period, if any.

The security itself is represented by three fields -

- Security Type (e.g. GS for Government Securities),
- Security (e.g. CG2010 - Central Government maturing in 2010) and
- Issue (e.g. 6.25%).

All order matching is on the basis of descriptors. All inquiries also require the selection of valid descriptors. There are 6 fields, which together form an entity, which is called 'Security Descriptor' in the system:

Security Type	Security	Issue	Settlement days	Trade Type	Repo Term
GS	CG2001	11.55%	1	Non Repo	-
TB	364D	060901	1	Repo	7

All trade matching is essentially on the basis of descriptor, its price (for non-repos)/ rate (for repos) volume and order conditions and types. All volumes, in order entry screens and display screens, are in Rs. lakh unless informed to the trading members otherwise. All prices are in Rupees. Repo rates are in percentages.

A maximum of two decimal places are allowed for values and four decimal places for prices. The Exchange sets the multiples (incremental value) in which orders can be entered for different securities. The Exchange announces from time to time the minimum order size and increments thereof for various securities traded on the Exchange.

Maximum Brokerage & Transaction Charges in Government Securities:

In light of the recent fraudulent transactions in the guise of government securities transactions in physical format, RBI decided to accelerate the measures for further reducing the scope for trading in physical form. The measures are as follows:

(i) For banks which do not have SGL account with RBI, only one CSGL account can be opened.

(ii) In case the CSGL accounts are opened with a scheduled commercial bank, the account holder has to open a designated funds account (for all CSGL related transactions) with the same bank.

(iii) The entities maintaining the CSGL/designated funds accounts will be required to ensure availability of clear funds in the designated funds accounts for purchases and of sufficient securities in the CSGL account for sales before putting through the transactions.

(iv) No further transactions by the bank should be undertaken in physical form with any broker with immediate effect.

(v) Banks should ensure that brokers approved for transacting in Government securities are registered with the debt market segment of NSE/BSE/OTCEI.

(vi) It should also be ensured that users of NDS deal directly on the system and use the system for transactions on behalf of their clients.

Brokerage Charges:

NSE has specified the maximum rates of brokerage that can be levied by trading members for trades on WDM. The rate depends on the type of security and value of transactions.

The rate for central government securities ranges from 5 paise to 25 paise for every Rs. 100 of transactions. Similarly it ranges from 10 paise to 50 paise for state government securities. It is 1% of the order value for debentures, securitised debt and commercial paper. Details are as under:

Govt. Of India Securities and T-Bills	
Order Value upto Rs.10 million	25 ps. per Rs.100
More than 10 million upto 50 million	15 ps. per Rs.100
More than 50 million upto 100 million	10 ps per Rs.100
More than 100 million	5 ps per Rs.100
State Govt. Securities & Institutional Bonds	
Order Value upto Rs.2.5 million	50 ps. per Rs.100
More than 2.5 million upto 5 million	30 ps. per Rs.100
More than 5 million upto 10 million	25 ps per Rs.100
More than 10 million upto 50 million	15 ps per Rs.100

More than 50 million upto 100 million	10 ps per Rs.100
More than 100 million	5 ps per Rs.100
PSU & Floating Rate Bonds	
Order Value upto Rs.10 million	50 ps. per Rs.100
More than 10 million upto 50 million	25 ps. per Rs.100
More than 50 million upto 100 million	15 ps per Rs.100
More than 100 million	10 ps per Rs.100
Commercial paper and Debentures	1% of the order value

A trading member is required to pay transaction charges @ Rs. 0.25 per lakh of turnover subject to maximum of Rs. 1 lakh per year. However, this has been waived at present for trading members.

4.3.5 Clearing and Settlement

A fast, transparent and efficient clearing system constitutes the basic foundation of a well developed secondary market in government securities. Dematerialised holding of government securities in the form of Subsidiary General Ledger (SGL) was introduced to enable holding of securities in an electronic book entry form by participants. The book entry form enhances the transactional efficiency and mitigates risks associated with the physical movement of securities by obviating the movement of physical movement of physical securities during transfers. A dematerialization drive has also been undertaken to convert all physical holdings of government securities into dematerialized form. Consequently, at present about 99 % of government securities holdings (in value terms) are held in dematerialized form.

The Delivery *versus* Payments (D*v*P) system in India was operationalised in 1995 to synchronise transfer of securities with cash payments, thereby eliminating settlement risk in securities transactions. The Reserve Bank operates a government securities settlement system for financial entities with SGL accounts in its Public Debt Offices through D*v*P System. Under the current system, banks, financial institutions, insurance companies and PDs are allowed to hold SGL accounts for securities and current accounts for cash. For these participants, the settlement is done through the D*v*P system. Other participants such as corporates, mutual funds, provident funds, co-operative banks and societies, and individuals, who are not allowed to hold direct SGL accounts with the Reserve Bank, can operate *via* the constituents' SGL account maintained by SGL account holders. Detailed guidelines have been issued to ensure that entities providing custodial services for their constituents employ appropriate accounting practices and safeguards.

The D*v*P system, which was initially on the basis of gross settlement for both securities and funds (D*v*P–I method), shifted to D*v*P-II method where settlement for securities was on a gross basis but settlement of funds was on a net basis. Both funds and securities are settled on a net basis (D*v*P-III method) since 2004. Each security is deliverable/ receivable on a net

basis for a particular settlement cycle and securities are netted separately for SGL and CSGL transactions. Netting of funds is done on a multilateral basis. These changes facilitated the rollover of repurchase transactions and also sale of securities purchased during the same settlement cycle without waiting for delivery. The D*v*P III has helped participants to manage their interest rate risk more efficiently by enabling them to cover their positions on the day of allotment in the auction. Net settlement of funds has also enhanced trading activity by reducing the fund requirement (gross to net) during the settlement cycle.

All trades in government securities are reported to RBI-SGL for settlement. The trades are settled on gross basis through the D*v*P III system, net settlement of securities and funds simultaneously. Central government securities and T-bills are held as dematerialised entries in the SGL of RBI. The PDO, which oversees the settlement of transactions through the SGL, enables the transfer of securities from one participant to another. Transfer of funds is effected by crediting/debiting the current account of the seller/buyer, maintained with the RBI. Securities are transferred through credits/debits in the SGL account. In order to do this, the SGL Form is filled by the seller, countersigned by the buyer, and sent to the RBI. The buyer transfers funds towards payment. The SGL form contains transfer instruction for funds and securities signed by both counter-parties and has to be submitted to RBI within one working day after the date of signing the form. The SGL form provides details of the buyer and the seller, the security, the clean price, accrued interest and details of credit in the current account.

Most transactions in government securities are placed through brokers. Buyers and sellers confirm transactions through phone and fax, after the deal is made. Brokers are usually paid a commission of 0.50 paise per market lot (of Rs. 5 crore), for deals upto Rs. 20 crore. Larger deals attract fixed commissions.

Gross settlement occasionally leads to gridlock in the DvP system due to shortfall of funds on a gross basis in the current accounts of one or more SGL account holders, though sufficient balance are available to settle on net basis. To take care of such unusual occurrences, the scheme of special fund facility provides intra-day funds to banks and primary dealers against un-drawn collateralised lending facility and liquidity support facility from RBI.

The CCIL was established on February 15, 2002 to act as the clearing house and as a central counterparty through novation for transactions in government securities. The CCIL has 154 members participating in the securities settlement segment. The establishment of CCIL has ensured guaranteed settlement of trades in government securities, thereby imparting considerable stability to the markets. Through the multilateral netting arrangement, this mechanism has reduced funding requirements from gross to net basis, thereby reducing liquidity risk and greatly mitigating counterparty credit risk. The CCIL has been equipped with the risk management system to limit the settlement risk. Operational guidelines were issued to the CCIL in April 2003 for a limited purpose government securities lending scheme. Accordingly, the CCIL has been permitted to enter into an arrangement with any of its

members for borrowing government securities for the purpose of handling securities shortage in settlement. All transactions in government securities concluded or reported on NDS as well as transactions on the NDS-OM have to be necessarily settled through the CCIL. The net obligations of members are arrived at by the CCIL for both funds and securities and then sent to the Reserve Bank for settlement under the D*v*P mechanism.

As a step towards introducing the national settlement system (NSS) with the aim of settling centrally the clearing positions of various clearing houses, the integration of the integrated accounting system (IAS) with the real time gross settlement system (RTGS) was initiated in August, 2006. This facilitates settlement of various CCIL-operated clearings (inter-bank government securities, inter-bank foreign exchange, CBLO and National Financial Switch) through multilateral net settlement batch (MNSB) mode in the RTGS in Mumbai. On stabilisation of MNSB in Mumbai, settlements at other centres under the NSS would be taken up in a phased manner.

The government securities market earlier followed both T+0 and T+1 settlement systems. In order to provide participants with more processing time and facilitate better funds and risk management, the settlement cycle for secondary market government securities transactions has been standardised to T+1, effective May 11, 2005.

Constituent SGL Accounts

Subsidiary General Ledger (SGL) account is a facility provided by RBI to large banks and financial institutions to hold their investments in government securities and T-bills in the electronic book entry form. Such institutions can settle their trades for securities held in SGL through a DvP mechanism, which ensures simultaneous movement of funds and securities. As all investors in government securities do not have an access to the SGL accounting system, RBI has permitted such investors to open a gilt with any entity authorized by RBI for this purpose and thus avail of the DvP settlement. RBI has permitted NSCCL, NSDL, CDSL, SHCIL, banks, and PDs to offer constituent SGL account facility to an investor who is interested in participating in the government securities market. The facilities offered by the constituent SGL accounts are dematerialisation, re-materialisation, buying and selling of transactions, corporate actions, and subscription to primary market issues. All entities regulated by RBI [including FIs, PDs, cooperative banks, RRBs, local area banks, NBFCs] should necessarily hold their investments in government securities in either SGL (with RBI) or CSGL account.

Clearing Corporation of India Limited

The Clearing Corporation of India Limited (CCIL), promoted by the banks and financial institutions, was incorporated in April 2001 to support and facilitate clearing and settlement of trades in government securities (and also trades in forex and money markets).

CCIL commenced its operations with settlement of secondary market transactions in Government securities sans novation, under DVP II mode, but in two months time it moved to extend

Guaranteed Settlement as a central counter party. When CCIL initially commenced operations it was given the mandate to facilitate settlement of all Repo and outright transactions upto Rs.200 million. Though settlement through CIIL of outright transactions beyond 200 million was not mandatory, around 65 % of such trades were settled by CCIL. However, with effect from April 2003, it was made mandatory for all trades reported on the NDS to be settled through CCIL, irrespective of the value. CCIL switched over to the DVP III mode settlement since April 2, 2004. Currently about 94% of the trades are settled through CCIL while remaining are generally trades where RBI is the counterparty and trades between custodian and its own GILT account holder which are directly settled at RBI. CCIL undertakes the clearing and settlement of all outright as well as repo transactions reported by members in the NDS and flow to CCIL for settlement. The final settlement of all transactions relating to government securities takes place in the books of RBI at their Public Debt Office/ Deposits Account Department, Mumbai. The settlement is achieved in DVP III mode viz. both funds and securities are settled on net basis. CCIL guarantees settlement of trade and is the central counter-party to every trade. The inception of guaranteed clearing and settlement of government securities has brought about significant improvements in the efficiency, transparency, liquidity and risk management/ measurement practices in the market.

CCIL has developed an anonymous trading platform, NDS-OM in August 2005 for the RBI to facilitate transparent and efficient trading in the government securities market. The key features of this system like its order matching on time-priority basis for dated securities, anonymity, real time information dissemination leading to better price discovery and straight through processing (STP) linkages to CCIL settlement system etc. has resulted in a significant shift in the trading patterns in the gilts market from being an opaque telephone driven system to an anonymous an transparent one. Initially, limited to banks and primary dealers, the gradual extension of trading in this platform to other NDS members like insurance companies, mutual funds and non-NDS members like provident funds, port trusts etc. has ensured that trading in the government securities market has become transparent for the participants. Trading in T-bills and when issued securities was facilitated on this platform with effect from July 31, 2006.

The members pay one-time membership fees of Rs. 1 lakh. In addition, they pay the fees for different services as under:

Sr. No.	Particulars	Charges
1	Securities Settlement (Outright)	Rs.150 per crore of face value, Minimum Rs.25/- Maximum Rs.5,000/- per Trade.
2	Treasury Bills Settlement (Outright)	Rs.75 per crore of face value, Minimum Rs.25/- Maximum Rs.5,000/- per Trade
3	Settlement of Repo Trades	Rs. 15/- per crore of face value for repo trades subject to Minimum of Rs. 15/- and Maximum of Rs. 1,500/- for each leg.

Sr. No.	Particulars	Charges
4	Clearcorp Transaction Charges CBLO (AUTION MARKET)	Rs. 5/- per crore of face value per deal per member subject to Minimum of Rs. 5/-- and Maximum of Rs. 500/- per deal.
5	Clearcorp Transaction Charges CBLO (NORMAL MARKET)	Rs. 5/- per crore of face value per deal per member subject to Minimum of Rs. 5/-- and Maximum of Rs. 500/- per trade.
6	CBLO Transaction Charges CBLO (AUCTION MARKET)	Rs. 10/- per crore of face value per deal per Member subject to minimum of Rs. 10/- and a maximum of Rs.1,000/- per deal for each member to be charged at the time of initial borrowings and lending.
7	CBLO Transaction Charges CBLO (NORMAL MARKET)	Rs. 10/- per crore of face value per deal per member subject to Minimum of Rs.10/- and a Maximum of Rs1,000/- per deal.
8	Settlement of Forex transactions	Rs.100/- per traded accepted for settlement.
9	Settlement of CLS transactions	CLS Charges plus 75 cents.
10	Delayed payment of Transaction Charges and System Usage Charges- For Securities and Forex Transactions (if payment is made after 10th of a calendar month.)	5 basis point per day on the amount of Charges

Members conclude trades, on-line, on the NDS platform, via the INFINET network, a secure closed-user group (CUG) hybrid network consisting of VSATs and leased lines. After trades have been concluded on the NDS, details are forwarded to the CCIL system, via INFINET, for settlement. All Repo deals by NDS members irrespective of amount are settled through CCIL.

CCIL has in place a comprehensive risk management system. It encompasses strict admission norms, measures for risk mitigation (in the form of exposure limit, settlement Guarantee Fund, liquidity arrangements, continuous position monitoring and loss allocation procedure) penalties in case of default etc. Each member contributes collaterals (partly in cash and partly in acceptable securities) to a Settlement Guarantee Fund (SGF), against which CCIL avails of a line of credit from a bank(s) so as to be able to complete settlement in case a situation of shortage resulting from a member's default is experienced. The price risk (on account of securities held by CCIL pending settlement of trades and transfer of ownership to the respective members) is mitigated by stipulating that members contribute additional collaterals in the form of Initial and Mark-to-Market (MTM) Margins. Securities contributed by, and standing to the credit of, members (their "SGF Contribution") are marked to market at fortnightly intervals, and calls for additional collateral made if needed. In case of funds shortages, CCIL completes

settlement by utilizing the cash component of the concerned member's contribution to SGF and/or the lines of credit available to CCIL from banks and/or by entering into a reverse repo transaction with market participants. In case of securities shortages, CCIL arranges to complete settlement by transferring the security/ securities to the member concerned, either from its Settlement Guarantee Fund SGL Account or from its own Proprietary SGL Account at RBI, or by paying a cash compensation in lieu thereof, to the member to whom the security was to be delivered. The rupee funds payable to the defaulting member are withheld, and the securities utilised in completing settlement replenished the next day. The defaulting member has to pay a penalty for defaulting on its obligations and bear any other costs incurred by CCIL in meeting the default situation.

4.3.6 Retail Debt Market

With a view to encouraging wider participation of all classes of investors across the country (including retail investors) in government securities, the Government, RBI and SEBI have introduced trading in government securities for retail investors. Trading in this retail debt market segment (RDM) on NSE has been introduced w.e.f. January 16, 2003.

***RDM Trading**:*

Trading takes place in the existing Capital Market segment of the Exchange and in the same manner in which the trading takes place in the equities (Capital Market) segment. The RETDEBT Market facility on the NEAT system of Capital Market Segment is used for entering transactions in RDM session. The trading holidays and market timings of the RDM segment are the same as the Equities segment.

Trading Parameters: The trading parameters for RDM segment are as below:

Face Value	Rs. 100/-
Permitted Lot Size	10
Tick Size	Rs. 0.01
Operating Range	+/- 5%
Mkt. Type Indicator	D (RETDEBT)
Book Type	RD

Trading in Retail Debt Market is permitted under Rolling Settlement, where in each trading day is considered as a trading period and trades executed during the day are settled based on the net obligations for the day. Settlement is on a T+2 basis i.e. on the 2nd working day. For arriving at the settlement day all intervening holidays, which include bank holidays, NSE holidays, Saturdays and Sundays are excluded. Typically trades taking place on Monday are settled on Wednesday, Tuesday's trades settled on Thursday and so on.

Eligibility: Trading Members who are registered members of NSE in the Capital Market segment and Wholesale Debt Market segment are allowed to trade in Retail Debt Market (RDM) subject

to fulfilling the capital adequacy norms. Trading Members with membership in Wholesale Debt Market segment only, can participate in RDM on submission of a letter in the prescribed format.

RDM Clearing & Settlement:

National Securities Clearing Corporation Limited (NSCCL) is the clearing and settlement agency for all deals executed in Retail Debt Market.

Salient features of Clearing and Settlement in Retail Debt Market segment:

- Clearing and settlement of all trades in the Retail Debt Market shall be subject to the Bye Laws, Rules and Regulations of the Capital Market Segment and such regulations, circulars and requirements etc. as may be brought into force from time to time in respect of clearing and settlement of trading in Retail Debt Market (Government securities).
- Settlement in Retail Debt Market is on T + 2 Rolling basis viz. on the 2nd working day. For arriving at the settlement day all intervening holidays, which include bank holidays, NSE holidays, Saturdays and Sundays are excluded. Typically trades taking place on Monday are settled on Wednesday, Tuesday's trades settled on Thursday and so on.
- Clearing and settlement would be based on netting of the trades in a day.
- NSCCL shall compute member obligations and make available reports/data by T+1. The obligations shall be computed separately for this market from the obligations of the equity market.
- The settlement schedule for the Retail Debt Market (Government Securities)

Day	**Description**
T	Trade Date
T + 1 (03:30 p.m.)	Custodial Confirmation
T + 2 (11.00 a.m.)	Securities & Funds pay-in
T + 2	Securities & Funds pay-out

- Funds settlement and securities settlement are through the existing clearing banks and depositories of NSCCL, in a manner similar to the Capital Market segment. The existing clearing bank accounts shall be used for funds settlement.
- The existing CM pool account with the depositories that is currently operated for the CM segment, will be utilized for the purpose of settlements of securities.
- In case of short deliveries, unsettled positions shall be closed out. The close out would be done at Zero Coupon Yield Curve valuation for prices plus a 5% penalty factor. The

buyer shall be eligible for the highest traded price from the trade date to the date of close out or closing price of the security on the close out date plus interest calculated at the rate of overnight FIMMDA-NSE MIBOR for the close out date whichever is higher and the balance should be credited to the Investor Protection Fund.

- The penal actions and penalty point is similar to as in Capital Markets

RDM Risk Management:

Base Capital & Networth Requirements

- Clearing members of Capital Market and Trading members of the WDM segment of the Exchange will be allowed to participate in clearing and settlement of trades done in Government securities, subject to a minimum net worth of Rs.1 crore.
- An initial contribution to the Settlement Guarantee Fund (SGF) of this market by way of interest free security deposit (IFSD) of Rs.5 lakh is required to be kept with NSCCL. A member desirous of participating in this segment may opt to set aside a contribution of Rs.5 lakh from his additional base capital available on the Capital Market segment and / or Futures & Options segment (s) towards this IFSD.

Margins & Gross Exposure Limits

- Mark to market margins will be applicable on all-open positions in government securities and shall be calculated on the basis of ZCYC prices. This margin shall be payable on T + 1 day.
- Custodial trades on behalf of Provident Funds transacting through the SGL-II accounts shall be eligible for margin exemption.
- The gross exposure in respect of these securities shall not exceed 20 times of the IFSD. Any member desirous of a higher exposure will be required to bring in additional base capital as in Capital Market segment.

4.3.7 Interest Rate Derivatives

Deregulation of interest rate exposed market participants to a wide variety of risks. To manage and control these risks and to deepen money market, scheduled commercial banks, primary dealers and all India financial institutions have been permitted to undertake forward rate agreements (FRAs) and interest rate swaps (IRSs).

A FRA is a financial contract between two parties to exchange interest payments for a 'notional principal' amount on settlement date, for a specified period from start date to maturity date. Accordingly, on the settlement date, based on contract (fixed) and the settlement rate, cash payments are made by the parties to one another. The settlement rate is the agreed bench-mark/ reference rate prevailing on the settlement date.

An IRS is a financial contract between two parties exchanging or swapping a stream of interest payments for a 'notional principal' amount on multiple occasions during a specified period. Such contracts generally involve exchange of a 'fixed to floating' rates of interest. Accordingly, on each payment date–that occurs during the swap period–cash payments based on fixed/ floating and floating rates, are made by the parties to one another. FRAs/IRSs provide means for hedging the interest rate risk arising on account of lendings or borrowings made at fixed/ variable interest rates.

Scheduled commercial banks (excluding Regional Rural Banks), primary dealers (PDs) and all-India financial institutions (FIs) undertake FRAs/ IRSs as a product for their own balance sheet management or for market making. Banks/FIs/PDS offer these products to corporates for hedging their (corporates) own balance sheet exposures.

Banks / PDS/ FIs can undertake different types of plain vanilla FRAs/ IRS. Swaps having explicit/implicit option features such as caps/floors/collars are not permitted. The parties are free to use any domestic money or debt market rate as benchmark rate for entering into FRAs/ IRS, provided methodology of computing the rate is objective, transparent and mutually acceptable to counterparties. The interest rates implied in the foreign exchange forward market can also used as a benchmark for undertaking FRAs/IRSs. There are no restrictions on the minimum or maximum size of 'notional principal' amounts of FRAs/ IRSs. There are also no restrictions on the minimum or maximum tenor of the FRAs/ IRSs.

4.3.8 Zero Coupon Yield Curve

The 'zero coupon yield curve' (ZCYC) starts from the basic premise of 'time value of money'– that a given amount of money due today has a value different from the same amount due at a future point of time. An individual willing to part with his money today has to be compensated in terms of a higher amount due in future – in other words, he has to be paid a rate of interest on the principal amount. The rate of interest to be paid would vary with the time period that elapses between today (when the principal amount is being foregone) and the future point of time (at which the amount is repaid). At any point of time therefore, we would observe different spot rates of interest associated with different terms to maturity; longer maturity offering a 'term spread' relative to shorter maturity. The term structure of interest rates, or ZCYC, is the set of such spot interest rates. This is the principal factor underlying the valuation of most fixed income instruments.

Fixed income instruments can be categorized by type of payments. Most fixed income instruments pay to the holder a periodic interest payment, commonly known as the coupon, and an amount due at maturity, the redemption value. There exist some instruments that do not make periodic interest payments; the principal amount together with the entire outstanding amount of interest on the instrument is paid as a lump sum amount at maturity. These instruments are also known as 'zero coupon' instruments (Treasury Bills provide an example of such an instrument). These are sold at a discount to the redemption value, the

discounted value being determined by the interest rate payable (yield) on the instrument.

Keeping in mind the requirements of the banking industry, financial institutions, mutual funds, insurance companies, etc. that have substantial investment in sovereign papers, NSE disseminates a 'Zero Coupon Yield Curve' (NSE Zero Curve) to help in valuation of securities across all maturities irrespective of its liquidity in the market. This product has been developed by using Nelson-Siegel model to estimate the term structure of interest rate at any given point of time. The spot rate function may be specified as follows:

$$r(m,b) = \beta_0 + (\beta_1 + \beta_2) * \{\frac{[1 - \exp(\frac{-m}{t})]}{(\frac{m}{t})}\} - \beta_2 * \exp(\frac{-m}{t})$$

where 'm' denotes related maturity for the cash flows in a bond and 'b' =[ß$_0$, ß$_1$, ß$_2$ and tau] are parameters to be estimated. Here ß$_0$ is the level parameter and commonly interpreted as long term (long term in mathematical sense – approaching infinity) rate, ß$_1$ is slope parameter, ß$_2$ is curvature parameter and tau (t) is scale parameter while (ß$_0$ + ß$_1$) gives the short term rate. Alternatively it can also be said that ß0 is the contribution of long term component, ß1 is the contribution of short term component, ß2 indicates the contribution of medium term component, tau is the decay factor and ß2 & tau determine the shape of the curve.

The appeal of the NS functional form lies in its flexibility to cover the entire range of possible shapes that the ZCYC can take, depending on the value of the estimated parameters. Once the functional form is specified and the parameter values are generated [b_0, b_1, b_2 and t], these values are used to calculate the spot rates for any term greater than 0 using the above equation. These spot rates are used to calculate the present value (commonly known as the estimated price or model price) of the cash flows and combine them to get the value of the bond. The present value arrived at is the estimated price (p_est) for each bond. These estimated values now can be compared with the observed market prices. It is common to observe market prices (pmkt) that deviate from this value. But the objective of a good estimation is to reduce the difference between the observed market prices and the estimated prices.

Illustration:

Given the following ZCYC Parameters for the settlement date March 15, 2003 as b_0 = 7.7103; b_1 = 0.5398; b_2 = 3.2907 and Tau (t) = 4.1902, what is the Model price of a security with semi-annual coupon of 6.25 %, maturing on March 23, 2004?

Explanation: Since half yearly coupon payment is Rs 6.25, on maturity date we receive Rs 106.25. [Redemption value (Rs.100) + half yearly coupon (Rs.6.25)]

Coupon date	Coupon Rate	Distance in years from Settlement date	Appropriate Zcyc spot rates	Present Value
	(A)	(m)	(C)	A / (1+ (C/200) ^ (m*2)
23-Mar-03	6.25	0.02	7.1633329	6.2404
23-Sep-03	6.25	0.53	7.0129545	6.0274
23-Mar-04	106.25	1.02	6.8890368	99.1262
		ZCYC Model Price:		111.394062

$$r(m,b) = \beta_0 + (\beta_1 + \beta_2) * \{\frac{[1 - \exp(\frac{-m}{t})]}{(\frac{m}{t})}\} - \beta_2 * \exp(\frac{-m}{t})$$

In the above table, appropriate Zcyc spot rates, using NS model (the above formula), are calculated as follows:

Term	Appropriate Zcyc Spot rates Using N-S Model
0.02	7.7103+ ((-0.5398 + -3.2907) * (1-Exp(-0.02 / 4.1902))/((0.02 / 4.1902)) - 3.2907 * Exp (-0.02 / 4.1902) = 7.1633329
0.53	7.7103+ ((-0.5398 + -3.2907) * (1-Exp(-0.53 / 4.1902))/((0.53 / 4.1902)) -3.2907 * Exp (-0.53 / 4.1902) = 7.0129545
1.02	7.7103+ ((-0.5398 + -3.2907) * (1-Exp(-1.02 / 4.1902))/((1.02 / 4.1902)) -3.2907 * Exp (-1.02 / 4.1902) = 6.8890368

The ZCYC is estimated and has been successfully tested by using daily WDM trades data. This is being disseminated daily. The ZCYC depicts the relationship between interest rates in the economy and the associated term to maturity. It provides daily estimates of the term structure of interest rates using information on secondary market trades in government securities from the WDM segment. The term structure forms the basis for the valuation of all fixed income instruments. Modeled as a series of cash flows due at different points of time in the future, the underlying price of such an instrument is calculated as the net present value of the stream of cash flows. Each cash flow, in such a formulation, is discounted using the interest rate for the associated term to maturity; the appropriate rates are read off the estimated ZCYC. Once estimated, the interest rate-maturity mapping is used to compute underlying valuations even for securities that do not trade on a given day. Changes in the economy cause shifts in the term structure, changing the underlying valuations of fixed income instruments. The daily ZCYC captures these changes, and is used to track the value of portfolios of government securities on a day-to-day basis.

4.3.9 FIMMDA-NSE MIBID/MIBOR

NSE has been computing and disseminating the NSE Mumbai Inter-bank Bid Rate (MIBID)

and NSE Mumbai Inter-bank Offer Rate (MIBOR) for the overnight money market from June 15, 1998, the 14-day MIBID/MIBOR from November 10, 1998 and the 1 month and 3 month MIBID/MIBOR from December 1, 1998. Further, the exchange introduced a 3 Day FIMMDA-NSE MIBID-MIBOR on all Fridays with effect from June 6, 2008.

In view of the robust methodology of computation of these rates and their extensive use by market participants, these have been co-branded with Fixed Income and Money Market Derivatives Association (FIMMDA) from March 4, 2002. These are now known as FIMMDA-NSE MIBID/MIBOR from March 4, 2002. These rates are used as benchmarks for majority of deals struck for interest rate swaps, forward rate agreements, floating rate debentures and term deposits.

FIMMDA-NSE MIBID/MIBOR are based on rates polled by NSE from a representative panel of 33 banks/institutions/primary dealers. Currently, quotes are polled and processed daily by the Exchange at 0940 (IST) for overnight rate, at 1130 (IST) for the 14 day, 1 month and 3 month rates and 0940 (IST) for 3 Day rate as on the last working day of the week. The rates polled are then processed using the bootstrap method to arrive at an efficient estimate of the reference rates. The overnight rates are disseminated daily and 3 Day rate are disseminated on the last working day of the week to the market at about 0955 (IST) and the 14 day, 1 month and 3 month rates at about 1145 (IST).Overnight Rates for Saturdays is calculated and disseminated at 1030Hrs. These are broadcast through NEAT-WDM trading system immediately on release and also disseminated through website of NSE and FIMMDA and through email.

4.3.10 NSE-VaR System

NSE has developed a Value-at-Risk (VaR) system for measuring the market risk inherent in Government of India (GOI) securities. NSE-VaR system builds on the NSE database of daily yield curves-the NSE-ZCYC which is now well accepted in terms of its conceptual soundness and empirical performance, and is increasingly being used by market participants as a basis for valuation of fixed income instruments. The NSE-VaR system provides measures of VaR using 5 alternative methods (normal (variance-covariance), weighted normal, historical simulation, weighted historical simulation and extreme value theory). Together, these 5 methods provide a range of options for market participants to choose from.

NSE-VaR system releases daily estimates of security-wise VaR at 1-day and multi-day horizons for securities traded on WDM segment of NSE and all outstanding GOI securities with effect from January 1, 2002. Participants can compute their portfolio risk as weighted average of security-wise VaRs, the weights being proportionate to the market value of a given security in their portfolio.

4.3.11 Bond Index

While there exists an array of indices for the equity market, a well-constructed and widely

accepted bond index is conspicuous by its absence. There are a few additional difficulties in construction and maintenance of debt indices. First, on account of the fixed maturity of bonds vis-à-vis the perpetuity of equity, the universe of bonds changes frequently (new issues come in while existing issues are redeemed). Secondly, while market prices for the constituents of an equity index are normally available on all trading days over a long period of time, market prices of constituent bonds in a bond index, irrespective of the selection criteria used, may not be available daily. This is on account of the fact that the liquidity of a security varies over its lifetime and, in addition, can witness significant fluctuations over a short period of time. However, market participants need an index to compare their performance with as well as the performance of different classes of assets.

NSE Government Securities Index

The increased activity in the government securities market in India and simultaneous emergence of mutual (gilt) funds has given rise to the need for a well-defined Bond Index to measure returns in the bond market. The NSE-Government Securities Index prices components off the NSE Benchmark ZCYC, so that movements reflect returns to an investor on account of change in interest rates only, and not those arising on account of the impact of idiosyncratic factors. The index is available from January 1, 1997. The index would provide a benchmark for portfolio management by various investment managers and gilt funds. It could also form the basis for designing index funds and for derivative products such as options and futures.

Salient features of the Index:

- The base date for the index is 1st January 1997 and the base date index value is 100
- The index is calculated on a daily basis from 1st January 1997 onwards; weekends and holidays are ignored.
- The index uses all Government of India bonds issued after April 1992. These were issued on the basis of an auction mechanism that imparted some amount of market-relatedness to their pricing. Bonds issued prior to 1992 were on the basis of administered interest rates.
- Each day, the prices for all these bonds are estimated off the NSE Benchmark-ZCYC for the day.
- The constituents are weighted by their market capitalisation.
- Computations are based on arithmetic and not geometric calculations.
- The index uses a chain-link methodology i.e. today's values are based on the previous value times the change since the previous calculations. This gives the index the ability to add new issues and also remove old issues when redeemed.

- Coupons and redemption payments are assumed to be re-invested back into the index in proportion to the constituent weights.
- Both the Total Returns Index and the Principal Returns Index are computed.
- The indices provided are: Composite, 1-3, 3-8, 8+ years, TB index, GS index

MODEL QUESTIONS

Ques:1 Calculate the ZCYC Spot rate for 2 Year maturity when β0=5.1596, β1= -0.3615, β2=4.5209, ٢ =13.1202?

(a) 5.135786 (b) 5.127548

(c) 5.142458 (d) 5.139978

Correct Answer: (a)

Solution:

Using the formula: R (m, b) = β0+ (β 1+ β2)*{1-exp (-m/٢)}/ (m/٢) - β2*exp (-m/٢) we get: 5.1596+((-0.3615+4.5209)*(1-EXP(-2/13.202))/((2/13.202))-4.5209*EXP (-2/13.202)) = 5.135786

Ques:2 Which instruments constitute the major portion of trades in secondary market of the debt segment?

(a) Dated Central Government securities.

(b) Treasury Bills

(c) Debentures

(d) Commercial Papers.

Correct Answer: (a)

Ques:3 What is the maximum % allocated to non-competitive bidders in Government securities auction?

(a) 10% (b) 15%

(c) 5 % (d) 20%

Correct Answer: (c)

Ques:4 What are the various types of Government securities?

(a) Only Fixed coupon Bonds & Floating rate Bonds.

(b) Only Floating rate Bonds & Zero Coupon Bonds.

(c) Only zero Coupon Bonds & Securities with embedded Derivatives

(d) Fixed coupon Bonds, Floating rate Bonds, Zero Coupon Bonds & Securities with embedded Derivatives

Correct Answer: (d)

Ques:5 What is the settlement period allowed for Government Securities?

(a) T+0 & T+3 (b) T+1 & T+3

(b) T+2 & T+3 (d) T+1

Correct Answer: (d)

Ques:6 Presently which of the following T-bills is traded in the market?

(a) 91 Days, 182 and 364 Days T-Bill

(b) 14 Days & 364 Days T-Bill

(c) 182 Days & 364 Days T-Bill

(d) 14 Days & 91 Days T-bill

Correct Answer: (a)

Ques:7 When are the FIMMDA-NSE MIBID/MIBOR rates polled daily by NSE-WDM?

(a) At 9.30 am & 11.30 am (b) At 9.40 am & 11.40 am

(c) At 9.50 am & 11.30 am (d) At 9.40 am & 11.30 am

Correct Answer: (d)

Ques:8. Which are the instruments used to calculate ZCYC?

(a) Only Central Government Securities.

(b) Only T-Bill

(c) Both T-bill & Central Government Securities.

(d) Corporate Debentures ,CD & CP

Correct Answer: (c)

Ques:9 What are the various securities on which Repo trades are allowed by RBI?

(a) Only Central Government Securities.

(b) Only Treasury Bills

(c) Only Central Government Securities & Treasury bills

(d) Central Government securities, Treasury Bills & State Government securities

(e) Central Government Securities, Treasury bills & corporate debts.

Correct Answer: (d)

CHAPTER 5: DERIVATIVES MARKET

5.1 DERIVATIVES

5.1.1 Introduction

Derivative is a product whose value is derived from the value of one or more basic variables, called bases (underlying asset, index or reference rate), in a contractual manner. The underlying asset can be equity, forex, commodity or any other asset. For example, wheat farmers may wish to sell their harvest at a future date to eliminate the risk of a change in prices by that date. Such a transaction is an example of a derivative. The price of this derivative is driven by the spot price of wheat which is the 'underlying'.

The International Monetary Fund defines derivatives as "*financial instruments that are linked to a specific financial instrument or indicator or commodity and through which specific financial risks can be traded in financial markets in their own right. The value of a financial derivative derives from the price of an underlying item, such as an asset or index. Unlike debt securities, no principal is advanced to be repaid and no investment income accrues*".

The emergence of the market for derivative products, most notably forwards, futures and options, can be traced back to the willingness of risk-averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. By their very nature, the financial markets are marked by a very high degree of volatility. Through the use of derivative products, it is possible to partially or fully transfer price risks by locking–in asset prices. As instruments of risk management, these generally do not influence the fluctuations in the underlying asset prices. However, by locking-in asset prices, derivative products minimise the impact of fluctuations in asset prices on the profitability and cash flow situation of risk-averse investors.

Derivative products initially emerged as hedging devices against fluctuations in commodity prices and commodity-linked derivatives remained the sole form of such products for almost three hundred years. The financial derivatives came into spotlight in post-1970 period due to growing instability in the financial markets. However, since their emergence, these products have become very popular and by 1990s, they accounted for about two-thirds of total transactions in derivative products. In recent years, the market for financial derivatives has grown tremendously both in terms of variety of instruments available, their complexity and also turnover. The factors generally attributed as the major driving force behind growth of financial derivatives are (a) increased volatility in asset prices in financial markets, (b) increased integration of national financial markets with the international markets, (c) marked improvement in communication facilities and sharp decline in their costs, (d) development of more sophisticated risk management tools, providing economic agents a wider choice of risk management strategies, and (e) innovations in the derivatives markets, which optimally

combine the risks and returns over a large number of financial assets, leading to higher returns, reduced risk as well as transaction costs as compared to individual financial assets. In the class of equity derivatives, futures and options on stock indices have gained more popularity than on individual stocks, especially among institutional investors, who are major users of index-linked derivatives. Even small investors find these useful due to high correlation of the popular indices with various portfolios and ease of use. The lower costs associated with index derivatives vis-à-vis derivative products based on individual securities is another reason for their growing use.

5.1.2 Products, participants and functions

Derivative contracts have several variants. The most common variants are forwards, futures, options and swaps. The following three broad categories of participants hedgers, speculators, and arbitrageurs trade in the derivatives market.

- Hedgers face risk associated with the price of an asset. They use futures or options markets to reduce or eliminate this risk.
- Speculators wish to bet on future movements in the price of an asset. Futures and options contracts can give them an extra leverage; that is, they can increase both the potential gains and potential losses in a speculative venture.
- Arbitrageurs are in business to take advantage of a discrepancy between prices in two different markets. If, for example, they see the futures price of an asset getting out of line with the cash price, they will take offsetting positions in the two markets to lock in a profit.

The derivatives market performs a number of economic functions. First, prices in an organised derivatives market reflect the perception of market participants about the future and lead the prices of underlying to the perceived future level. The prices of derivatives converge with the prices of the underlying at the expiration of the derivative contract. Thus, derivatives help in discovery of future as well as current prices. Second, the derivatives market helps to transfer risks from those who have them but may not like them to those who have an appetite for them. Third, derivatives, due to their inherent nature, are linked to the underlying cash markets. With the introduction of derivatives, the underlying market witnesses higher trading volumes because of participation by more players who would not otherwise participate for lack of an arrangement to transfer risk. Fourth, speculative trades shift to a more controlled environment of derivatives market. In the absence of an organised derivatives market, speculators trade in the underlying cash markets. Margining, monitoring and surveillance of the activities of various participants become extremely difficult in these kinds of mixed markets. Fifth, an important incidental benefit that flows from derivatives trading is that it acts as a catalyst for new entrepreneurial activity. The derivatives have a history of attracting many bright, creative, well-educated people with an entrepreneurial attitude. They often energise others to create new businesses, new products and new employment opportunities, the benefit of

which are immense. Finally, derivatives markets help increase savings and investment in the long run. Transfer of risk enables market participants to expand their volume of activity.

5.1.3 Types of Derivatives

The most commonly used derivatives contracts are forwards, futures and options which we shall discuss in detail later. Here we take a brief look at various derivatives contracts that have come to be used.

Forwards: A forward contract is a customised contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price.

Futures: A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the former are standardised exchange-traded contracts.

Options: Options are of two types – calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.

Warrants: Options generally have lives of upto one year, the majority of options traded on options exchanges having maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.

LEAPS: The acronym LEAPS means Long Term Equity Anticipation Securities. These are options having a maturity of upto three years.

Baskets: Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average or a basket of assets. Equity index options are a form of basket options.

Swaps: Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are:

- *Interest rate swaps*: These entail swapping only the interest related cash flows between the parties in the same currency
- *Currency Swaps*: These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.

Swaptions: Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus, swaptions is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions A receiver swaption is an option to receive fixed and pay floating. A payer swaption is an option to pay fixed and receive floating.

5.1.4 Derivatives Market in India

The first step towards introduction of derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives. SEBI set up a 24-member committee under the Chairmanship of Dr. L. C. Gupta on November 18, 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report on March 17, 1998 prescribing necessary pre-conditions for introduction of derivatives trading in India. The committee recommended that derivatives should be declared as 'securities' so that regulatory framework applicable to trading of 'securities' could also govern trading of securities. SEBI also set up a group in June 1998 under the chairmanship of Prof. J. R. Varma, to recommend measures for risk containment in derivatives market in India. The report, which was submitted in October 1998, worked out the operational details of margining system, methodology for charging initial margins, broker net worth, deposit requirement and real-time monitoring requirements.

The SCRA was amended in December 1999 to include derivatives within the ambit of 'securities' and the regulatory framework was developed for governing derivatives trading. The act also made it clear that derivatives shall be legal and valid only if such contracts are traded on a recognised stock exchange, thus precluding OTC derivatives. The government also rescinded in March 2000, the three-decade old notification, which prohibited forward trading in securities.

Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2000. SEBI permitted the derivatives segments of two stock exchanges NSE and BSE, and their clearing house/ corporation to commence trading and settlement in approved derivatives contracts. To begin with, SEBI approved trading in index futures contracts based on S&P CNX Nifty and BSE-30 (Sensex) index. This was followed by approval for trading in options which commenced in June 2001 and the trading in options on individual securities commenced in July 2001. Futures contracts on individual stocks were launched in November 2001. Futures and Options contracts on individual securities are available on more than 200 securities. Trading and settlement in derivative contracts is done in accordance with the rules, byelaws, and regulations of the respective exchanges and their clearing house/ corporation duly approved by SEBI and notified in the official gazette.

5.1.5 Membership of NSE

NSE admits members on its derivatives segment (more popularly referred to as F&O segment) in accordance with the rules and regulations of the Exchange and the norms specified by SEBI. NSE follows 2-tier membership structure stipulated by SEBI to enable wider participation. Those interested in taking membership on F&O segment are required to take membership of 'CM and F&O segment' or 'CM, WDM and F&O segment'. Trading and clearing members

are admitted separately. Essentially, a clearing member (CM) does clearing for all his trading members (TMs), undertakes risk management and performs actual settlement. The eligibility criteria for membership on F&O segment are summarised in tables 5.1 and 5.2. The trading members are required to have qualified users and sales persons, who have passed a certification programme approved by SEBI.

Refer to chapter 3 for further details about eligibility criteria of the membership.

Table 5.1: Eligibility Criteria for Membership on F&O Segment of NSE

Particulars	New Members	
	CM and F&O Segment	CM, WDM and F&O Segment
Net Worth[1]	Rs. 100 lakh	Rs. 200 lakh
Interest Free Security Deposit (IFSD)[2]	Rs. 125 lakh	Rs. 275 lakh
Collateral Security Deposit (CSD)[2]	Rs. 25 lakh	Rs. 25 lakh
Annual Subscription	Rs. 1 lakh	Rs. 2 lakh

Note: (1) No additional networth is required for self-clearing members in F&O segment. However, networth of Rs. 300 lakh is required for members clearing for self as well as for other trading member.
(2) Additional Rs. 25 lakh is required for clearing membership. In addition, the clearing member is required to bring in IFSD of Rs. 2 lakh and CSD of Rs. 8 lakh per trading member in the F&O segment.

Table 5.2: Requirements for Professional Clearing Membership

(Amount in Rs. lakh)

Particulars	CM Segment	F&O Segment
Eligibility	Trading Member of NSE/SEBI Registered Custodians/Recognised Banks	
Net Worth	300	300
Interest Free Security Deposit (IFSD) *	25	25
Collateral Security Deposit (CSD)	25	25
Annual Subscription	2.5	Nil

** The Professional Clearing Member (PCM) is required to bring in IFSD of Rs. 2 lakh and CSD of Rs. 8 lakh per trading member whose trades he undertakes to clear in the F&O segment and IFSD of Rs. 6 lakh and CSD of Rs. 17.5 lakh (Rs. 9 lakh and Rs. 25 lakh respectively for corporate Members) per trading member in the CM segment.*

5.2 Futures and Options

In recent years, derivatives have become increasingly important in the field of finance. While futures and options are now actively traded on many exchanges, forward contracts are popular on the OTC market.

5.2.1 Forward Contract

A forward contract is an agreement to buy or sell an asset on a specified date for a specified price. One of the parties to the contract assumes a long position and agrees to buy the underlying asset on a certain specified future date for a certain specified price. The other party assumes a short position and agrees to sell the asset on the same date for the same price.

Other contract details like delivery date, price and quantity are negotiated bilaterally by the parties to the contract. The forward contracts are normally traded outside the exchanges.

The salient features of forward contracts are:

- They are bilateral contracts and hence exposed to counter–party risk.
- Each contract is custom designed, and hence is unique in terms of contract size, expiration date and the asset type and quality.
- The contract price is generally not available in public domain.
- On the expiration date, the contract has to be settled by delivery of the asset.
- If the party wishes to reverse the contract, it has to compulsorily go to the same counterparty, which often results in high prices being charged.

However, forward contracts in certain markets have become very standardised, as in the case of foreign exchange, thereby reducing transaction costs and increasing transactions volume. This process of standardisation reaches its limit in the organised futures market.

Forward contracts are very useful in hedging and speculation. The classic hedging application would be that of an exporter who expects to receive payment in dollars three months later. He is exposed to the risk of exchange rate fluctuations. By using the currency forward market to sell dollars forward, he can lock on to a rate today and reduce his uncertainty. Similarly an importer who is required to make a payment in dollars two months hence can reduce his exposure to exchange rate fluctuations by buying dollars forward.

If a speculator has information or analysis, which forecasts an upturn in a price, then he can go long on the forward market instead of the cash market. The speculator would go long on the forward, wait for the price to rise, and then take a reversing transaction to book profits. Speculators may well be required to deposit a margin upfront. However, this is generally a relatively small proportion of the value of the assets underlying the forward contract. The use of forward markets here supplies leverage to the speculator.

Forward markets world-wide are afflicted by several problems:
- Lack of centralisation of trading,
- Illiquidity, and
- Counterparty risk

In the first two of these, the basic problem is that of too much flexibility and generality. The forward market is like a real estate market in that any two consenting adults can form contracts against each other. This often makes them design terms of the deal which are very convenient in that specific situation, but makes the contracts non-tradable. Counterparty risk arises from the possibility of default by any one party to the transaction. When one of the two sides to the transaction declares bankruptcy, the other suffers. Even when forward markets trade standardised contracts, and hence avoid the problem of illiquidity, still the counterparty risk remains a very serious issue.

5.2.2 Futures

Futures markets were designed to solve the problems that exist in forward markets. A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. But unlike forward contracts, the futures contracts are standardised and exchange traded. To facilitate liquidity in the futures contracts, the exchange specifies certain standard features of the contract. It is a standardised contract with standard underlying instrument, a standard quantity and quality of the underlying instrument that can be delivered, (or which can be used for reference purposes in settlement) and a standard timing of such settlement.

A futures contract may be offset prior to maturity by entering into an equal and opposite transaction. More than 99% of futures transactions are offset this way. The standardised items in a futures contract are:

- Quantity of the underlying
- Quality of the underlying
- The date and the month of delivery
- The units of price quotation and minimum price change
- Location of settlement

Distinction between futures and forwards contracts: Forward contracts are often confused with futures contracts. The confusion is primarily because both serve essentially the same economic functions of allocating risk in the presence of future price uncertainty. However futures are a significant improvement over the forward contracts as they eliminate counterparty risk and offer more liquidity. Table 5.3 lists the distinction between the two.

Table 5.3 Distinction between futures and forwards

Futures	Forwards
Trade on an organised exchange	OTC in nature
Standardised contract terms	Customised contract terms
Hence more liquid	Hence less liquid
Requires margin payments	No margin payment
Follows daily settlement	Settlement happens at end of period

Futures terminology

- ***Spot price*:** The price at which an asset trades in the spot market.
- ***Futures price***: The price at which the futures contract trades in the futures market.
- ***Contract cycle***: The period over which a contract trades. The index futures contracts on the NSE have one month, two-month and three-month expiry cycles which expire

on the last Thursday of the month. Thus a January expiration contract expires on the last Thursday of January and a February expiration contract ceases trading on the last Thursday of February. On the Friday following the last Thursday, a new contract having a three-month expiry is introduced for trading.

- ***Expiry date***: It is the date specified in the futures contract. This is the last day on which the contract will be traded, at the end of which it will cease to exist.
- ***Contract size***: The amount of asset that has to be delivered under one contract. Also called as lot size.
- ***Basis*****:** In the context of financial futures, basis can be defined as the futures price minus the spot price. There will be a different basis for each delivery month for each contract. In a normal market, basis will be positive. This reflects that futures prices normally exceed spot prices.
- ***Cost of carry***: The relationship between futures prices and spot prices can be summarised in terms of what is known as the cost of carry. This measures the storage cost plus the interest that is paid to finance the asset less the income earned on the asset.
- ***Initial margin***: The amount that must be deposited in the margin account at the time a futures contract is first entered into is known as initial margin.
- ***Marking-to-market***: In the futures market, at the end of each trading day, the margin account is adjusted to reflect the investor's gain or loss depending upon the futures closing price. This is called marking–to–market.
- ***Maintenance margin***: This is somewhat lower than the initial margin. This is set to ensure that the balance in the margin account never becomes negative. If the balance in the margin account falls below the maintenance margin, the investor receives a margin call and is expected to top up the margin account to the initial margin level before trading commences on the next day.

5.2.3 Options

Options are fundamentally different from forward and futures contracts. An option gives the holder of the option the right to do something. The holder does not have to exercise this right. In contrast, in a forward or futures contract, the two parties have committed themselves to doing something. Whereas it costs nothing (except margin requirements) to enter into a futures contract, the purchase of an option requires an upfront payment.

Options terminology

- ***Index options***: These options have the index as the underlying. Like index futures contracts, index options contracts are also cash settled.

- ***Stock options***: Stock options are options on individual stocks. Options currently trade on over 500 stocks in the United States. A contract gives the holder the right to buy or sell shares at the specified price.
- ***Buyer of an option***: The buyer of an option is the one who by paying the option premium buys the right but not the obligation to exercise his option on the seller/ writer.
- ***Writer of an option***: The writer of a call/put option is the one who receives the option premium and is thereby obliged to sell/buy the asset if the buyer wishes to exercise his option.

There are two basic types of options, call options and put options.

- ***Call option***: A call option gives the holder the right but not the obligation to buy an asset by a certain date for a certain price.
- ***Put option***: A put option gives the holder the right but not the obligation to sell an asset by a certain date for a certain price.
- ***Option price***: Option price is the price which the option buyer pays to the option seller. It is also referred to as the option premium.
- ***Expiration date***: The date specified in the options contract is known as the expiration date, the exercise date, the strike date or the maturity.
- ***Strike price***: The price specified in the options contract is known as the strike price or the exercise price.
- ***American options***: American options are options that can be exercised at any time upto the expiration date.
- ***European options***: European options are options that can be exercised only on the expiration date itself. European options are easier to analyse than American options, and properties of an American option are frequently deduced from those of its European counterpart.
- ***In-the-money option***: An in-the-money (ITM) option is an option that would lead to a positive cash flow to the holder if it were exercised immediately. A call option on the index is said to be in-the-money when the current value of index stands at a level higher than the strike price (i.e. spot price > strike price). If the value of index is much higher than the strike price, the call is said to be deep ITM. On the other hand, a put option on index is said to be ITM if the value of index is below the strike price.
- ***At-the-money option***: An at-the-money (ATM) option is an option that would lead to zero cash flow if it were exercised immediately. An option on the index is at-the-money when the value of current index equals the strike price (i.e. spot price = strike price).

- ***Out-of-the-money option***: An out-of-the-money (OTM) option is an option that would lead to a negative cash flow it was exercised immediately. A call option on the index is said to be out-of-the-money when the value of current index stands at a level which is less than the strike price (i.e. spot price < strike price). If the index is much lower than the strike price, the call is said to be deep OTM. On the other hand, a put option on index is OTM if the value of index is above the strike price.
- ***Intrinsic value of an option***: The option premium can be broken down into two components–intrinsic value and time value. Intrinsic value of an option is the difference between the market value of the underlying security/index in a traded option and the strike price. The intrinsic value of a call is the amount when the option is ITM, if it is ITM. If the call is OTM, its intrinsic value is zero.
- ***Time value of an option***: The time value of an option is the difference between its premium and its intrinsic value. Both calls and puts have time value. An option that is OTM or ATM has only time value. Usually, the maximum time value exists when the option is ATM. The longer the time to expiration, the greater is an option's time value, all else equal. At expiration, an option should have no time value. While intrinsic value is easy to calculate, time value is more difficult to calculate. Historically, this made it difficult to value options prior to their expiration. Various option pricing methodologies were proposed, but the problem wasn't solved until the emergence of Black-Scholes theory in 1973.

Distinction between Futures and options

Options are different from futures in several interesting senses. At a practical level, the option buyer faces an interesting situation. He pays for the option in full at the time it is purchased. After this, he only has an upside. There is no possibility of the options position generating any further losses to him (other than the funds already paid for the option). This is different from futures, which is free to enter into, but can generate very large losses. This characteristic makes options attractive to many occasional market participants, who cannot put in the time to closely monitor their futures positions.

Buying put options is buying insurance. To buy a put option on Nifty is to buy insurance which reimburses the full extent to which Nifty drops below the strike price of the put option. This is attractive to many people, and to mutual funds creating 'guaranteed return products'. The Nifty index fund industry will find it very useful to make a bundle of a Nifty index fund and a Nifty put option to create a new kind of a Nifty index fund, which gives the investor protection against extreme drops in Nifty. Selling put options is selling insurance, so anyone who feels like earning revenues by selling insurance can set himself up to do so on the index options market.

More generally, options offer 'non-linear payoffs' whereas futures only have 'linear payoffs'. By combining futures and options, a wide variety of innovative and useful payoff structures can be created.

Table 5.4 Distinction between futures and options

Futures	Options
Exchange traded, with novation	Same as futures.
Exchange defines the product	Same as futures.
Price is zero, strike price moves	Strike price is fixed, price moves.
Price is zero	Price is always positive.
Linear payoff	Non-linear payoff.
Both long and short at risk	Only short at risk.

5.2.4 Pricing of Derivatives

Pricing Futures:

Stock index futures began trading on NSE on the 12th June 2000. Stock futures were launched on 9th November 2001. The volumes and open interest on this market has been steadily growing. Looking at the futures prices on NSE's market, have you ever felt the need to know whether the quoted prices are a true reflection of the price of the underlying index/stock? Have you wondered whether you could make risk-less profits by arbitraging between the underlying and futures markets? If so, you need to know the cost-of-carry to understand the dynamics of pricing that constitute the estimation of fair value of futures.

The cost of carry model: We use fair value calculation of futures to decide the no-arbitrage limits on the price of a futures contract. This is the basis for the cost-of-carry model where the price of the contract is defined as:

$$F = S + C$$

Where,

F = Futures price; S = Spot price; C = Holding costs or carry costs.

This can also be expressed as:

$F = S (1 + r)^T$

r = Cost of financing and T = Time till expiration of futures contract

If $F < S(1 + r)^T$ or $F > S(1 + r)^T$, arbitrage opportunities would exist i.e. whenever the futures price moves away from the fair value, there would be chances for arbitrage. We know what the spot and futures prices are, but what are the components of holding cost? The components of holding cost vary with contracts on different assets. At times the holding cost may even be negative. In the case of commodity futures, the holding cost is the cost of

financing plus cost of storage and insurance purchased etc. In the case of equity futures, the holding cost is the cost of financing minus the dividends returns.

The concept of discrete compounding is used, where interest rates are compounded at discrete intervals, for example, annually or semi-annually. In case of the concept of continuous compounding, the above equation would be expressed as:

$$F = Se^{(rT)}$$

Where,

r = Cost of financing (using continuously compounded interest rate)

T = Time till expiration; and e = 2.71828

Example: Security XYZ Ltd trades in the spot market at Rs. 1150. Money can be invested at 11% p.a. The fair value of a one-month futures contract on XYZ is calculated as follows:

$$\begin{aligned} F &= Se^{rT} \\ &= 1150 * e^{0.11 * \frac{1}{12}} \\ &= 1160 \end{aligned}$$

***Pricing options**:*

An option buyer has the right but not the obligation to exercise on the seller. The worst that can happen to a buyer is the loss of the premium paid by him. His downside is limited to this premium, but his upside is potentially unlimited. This optionality is precious and has a value, which is expressed in terms of the option price. Just like in other free markets, it is the supply and demand in the secondary market that drives the price of an option. On dates prior to 31 Dec 2000, the 'call option on Nifty expiring on 31 Dec 2000 with a strike of 1500' will trade at a price that purely reflects supply and demand. There is a separate order book for each option which generates its own price. The values shown in Table 5.5 are derived from a theoretical model, namely the Black-Scholes option pricing model.

Table 5.5: Option prices: some illustrative values

	Option strike price				
	1400	1450	1500	1550	1600
Calls					
1 month	117	79	48	27	13
3 month	154	119	90	67	48
Puts					
1 month	8	19	38	66	102
3 month	25	39	59	84	114

Assumptions: Nifty spot is 1500, Nifty volatility is 25% annualized, interest rate is 10%, Nifty dividend yield is 1.5%.

If the secondary market prices deviate from these values, it would imply the presence of arbitrage opportunities, which (we might expect) would be swiftly exploited. But there is

nothing innate in the market which forces the prices in the table to come about.

There are various models which help us get close to the true price of an option. Most of these are variants of the celebrated Black-Scholes model for pricing European options. Today most calculators and spread-sheets come with a built-in Black-Scholes options pricing formula so to price options we don't really need to memorise the formula. What we shall do here is discuss this model in a fairly non-technical way by focusing on the basic principles and the underlying intuition.

Introduction to the Black–Scholes formulae

Options have existed—at least in concept—since antiquity. It wasn't until publication of the Black-scholes (1973) option pricing formula that a theoretically consistent framework for pricing options became available. That framework was a direct result of work by Robert Merton as well as Fisher Black and Myron Scholes. In 1997, Scholes and Merton won the Nobel Prize in economics for this work. Black had died in 1995, but otherwise would have shared the prize.

The ***factors*** affecting the option price are: (i) The spot price of the underlying, (ii) exercise price, (iii) risk-free interest rate, (iv) volatility of the underlying, (v) time to expiration and (vi) dividends on the underlying (stock or index). Interestingly before Black and Scholes came up with their option pricing model, there was a widespread belief that the expected growth of the underlying ought to affect the option price. Black and Scholes demonstrate that this is not true. The beauty of the Black and Scholes model is that like any good model, it tells us what is important and what is not. It doesn't promise to produce the exact prices that show up in the market, but certainly does a remarkable job of pricing options within the framework of assumptions of the model. Virtually all option pricing models, even the most complex ones, have much in common with the Black–Scholes model.

Black and Scholes start by specifying a simple and well–known equation that models the way in which stock prices fluctuate. This equation called *Geometric Brownian Motion*, implies that stock returns will have a lognormal distribution, meaning that the logarithm of the stock's return will follow the normal (bell shaped) distribution. Black and Scholes then propose that the option's price is determined by only two variables that are allowed to change: time and the underlying stock price. The other factors, namely, the volatility, the exercise price, and the risk–free interest rate do affect the option's price but they are not allowed to change.

By forming a portfolio consisting of a long position in stock and a short position in calls, the risk of the stock is eliminated. This hedged portfolio is obtained by setting the number of shares of stock equal to the approximate change in the call price for a change in the stock price. This mix of stock and calls must be revised continuously, a process known as delta hedging.

Black and Scholes then turn to a little–known result in a specialised field of probability known as stochastic calculus. This result defines how the option price changes in terms of the change

in the stock price and time to expiration. They then reason that this hedged combination of options and stock should grow in value at the risk–free rate. The result then is a partial differential equation. The solution is found by forcing a condition called a boundary condition on the model that requires the option price to converge to the exercise value at expiration. The end result is the Black and Scholes model.

5.3 TRADING SYSTEM

5.3.1 Introduction

The futures & options trading system of NSE, called 'National Exchange for Automated Trading' NEAT-F&O trading system, provides a fully automated screen-based trading for Index futures & options, stock futures & options and futures on interest rate on a nationwide basis as well as an online monitoring and surveillance mechanism. It supports an order driven market and provides complete transparency of trading operations. It is similar to that of trading of equities in the cash market segment.

The software for the F&O market has been developed to facilitate efficient and transparent trading in futures and options instruments. Keeping in view the familiarity of trading members with the current capital market trading system, modifications have been performed in the existing capital market trading system so as to make it suitable for trading futures and options.

5.3.2 Trading mechanism

The NEAT F&O system supports an order driven market, wherein orders match automatically. Order matching is essentially on the basis of security, its price, time and quantity. All quantity fields are in units and price in rupees. The lot size on the futures and options market is 50 for Nifty. The exchange notifies the regular lot size and tick size for each security traded on this segment from time to time. Orders, as and when they are received, are first time stamped and then immediately processed for potential match. When any order enters the trading system, it is an active order. If it finds a match, a trade is generated. If a match is not found, then the orders are stored in different 'books'. Orders are stored in price-time priority in various books in the following sequence:

- Best Price
- Within Price, by time priority.

Entities in the trading system

There are four entities in the trading system:

1. **Trading members:** Trading members are members of NSE. They can trade either on their own account or on behalf of their clients including participants. The exchange

assigns a Trading member ID to each trading member. Each trading member can have more than one user.

2. ***Clearing* members:** Clearing members are members of NSCCL. They carry out risk management activities and confirmation/inquiry of trades through the trading system.

3. **Professional clearing members:** professional clearing members is a clearing member who is not a trading member. Typically, banks and custodians become professional clearing members and clear and settle for their trading members.

4. **Participants:** A participant is a client of trading members like financial institutions. These clients may trade through multiple trading members but settle through a single clearing member.

Corporate hierarchy

In the F&O trading software, a trading member has the facility of defining a hierarchy amongst users of the system. This hierarchy comprises corporate manager, Admin user, branch manager and dealer.

1. **Corporate manager***:* The term 'Corporate manager' is assigned to a user placed at the highest level in a trading firm. Such a user can perform all the functions such as order and trade related activities, receiving reports for all branches of the trading member firm and also all dealers of the firm. Additionally, a corporate manager can define exposure limits for the branches of the firm. This facility is available only to the corporate manager.

2. **Branch manager***:* The branch manager is a term assigned to a user who is placed under the corporate manager. Such a user can perform and view order and trade related activities for all dealers under that branch.

3. **Dealer***:* Dealers are users at the lower most level of the hierarchy. A Dealer can perform view order and trade related activities only for oneself and does not have access to information on other dealers under either the same branch or other branches.

Below given cases explain activities possible for specific user categories:

1. **Clearing member corporate manager***:* He can view outstanding orders, previous trades and net position of his client trading members by putting the TM ID (Trading member identification) and leaving the Branch ID and and Dealer ID blank.

2. ***Clearing member and trading member corporate manager****:* He can view:

   (a) Outstanding orders, previous trades and net position of his client trading members by putting the TM ID and leaving the Branch ID and the Dealer ID blank.

(b) Outstanding orders, previous trades and net positions entered for himself by entering his own TM ID, Branch ID and User ID. This is his default screen.

(c) Outstanding orders, previous trades and net position entered for his branch by entering his TM ID and Branch ID fields.

(d) Outstanding orders, previous trades, and net positions entered for any of his users/dealers by entering his TM ID, Branch ID and user ID fields.

3. **Clearing member and trading member dealer***:* He can only view requests entered by him.

4. **Trading member corporate manager:** He can view

(a) Outstanding requests and activity log for requests entered by him by entering his own Branch and User IDs. This is his default screen.

(b) Outstanding requests entered by his dealers and/or branch managers by either entering the Branch and/or User IDs or leaving them blank.

5. **Trading member branch manager***:* He can view

(a) Outstanding requests and activity log for requests entered by him by entering his own Branch and User IDs. This is his default screen.

(b) Outstanding requests entered by his users either by filling the User ID field with a specific user or leaving the User ID field blank.

6. **Trading member dealer***:* He can only view requests entered by him.

Order types and conditions

The system allows the trading members to enter orders with various conditions attached to them as per their requirements. These conditions are broadly divided into the following three categories:

Time conditions

- *Day order:* A day order, as the name suggests is an order which is valid for the day on which it is entered. If the order is not executed during the day, the system cancels the order automatically at the end of the day.
- *Immediate or Cancel(IOC):* An IOC order allows the user to buy or sell a contract as soon as the order is released into the system, failing which the order is cancelled from the system. Partial match is possible for the order, and the unmatched portion of the order is cancelled immediately.

Price condition

- *Stop–loss:* This facility allows the user to release an order into the system, after the market price (Last Traded Price) of the security reaches or crosses a threshold price e.g. if for stop–loss buy order, the trigger is 1027.00, the limit price is 1030.00 and the market (last traded) price is 1023.00, then this order is released into the system once the market price reaches or exceeds 1027.00. This order is added to the regular lot book with time of triggering as the time stamp, as a limit order of 1030.00. For the stop–loss sell order, the trigger price has to be greater than the limit price.

Other conditions

- *Market price:* Market orders are orders for which no price is specified at the time the order is entered (i.e. price is market price). For such orders, the system determines the price.
- *Limit price:* Price of the order after triggering from Stop Loss Book.
- *Pro:* Pro means that the orders are entered on the trading member's own account.
- *Cli:* Cli means that the trading member enters the orders on behalf of a client.
- *Trigger Price:* Price at which an order gets triggered from Stop-loss book.

Several combinations of the above are allowed thereby providing enormous flexibility to the users.

Market watch window

The following windows are displayed on the trader workstation screen.

- Title bar
- Ticker window of futures and options market
- Ticker window of underlying(capital) market
- Tool bar
- Market watch window
- Inquiry window
- Snap quote
- Order/trade window
- System message window

The purpose of market watch is to allow continuous monitoring of contracts or securities that are of specific interest to the user. It displays trading information for contracts selected by the user. The user also gets a broadcast of all the cash market securities on the screen. This function also will be available if the user selects the relevant securities for display on the market watch screen. Display of trading information related to cash market securities will be on "Read only" format i.e. the dealer can only view the information on cash market but, cannot trade in them through the system. This is the main window from the dealer's perspective.

Inquiry window

The inquiry window enables the user to view information such as Market by Price (MBP), Previous Trades (PT), Outstanding Orders (OO), Activity log (AL), Snap Quote (SQ), Order Status (OS), Market Movement (MM), Market Inquiry (MI), Net Position, On line backup, Multiple index inquiry, Most active security and so on.

Placing orders on the trading system

For both the futures and the options market, while entering orders on the trading system, members are required to identify orders as being proprietary or client orders. Proprietary orders should be identified as 'Pro' and those of clients should be identified as 'Cli'. Apart from this, in the case of 'Cli' trades, the client account number should also be provided. The futures and options market is a zero sum game i.e. the total number of long in the contract always equals the total number of short in any contract. The total number of outstanding contracts (long/short) at any point in time is called the 'Open interest'. This Open interest figure is a good indicator of the liquidity in the contract. Based on studies carried out in international exchanges, it is found that open interest is maximum in near month expiry contracts.

Market spread/combination order entry

The NEAT F&O trading system also enables to enter spread/combination trades. This enables the user to input two or three orders simultaneously into the market. These orders will have the condition attached to it that unless and until the whole batch of orders finds a counter match, they shall not be traded. This facilitates spread and combination trading strategies with minimum price risk.

Basket trading

In order to provide a facility for easy arbitrage between futures and cash markets, NSE introduced basket-trading facility. This enables the generation of portfolio offline order files in the derivatives trading system and its execution in the cash segment. A trading member can buy or sell a portfolio through a single order, once he determines its size. The system automatically works out the quantity of each security to be bought or sold in proportion to their weights in the portfolio.

Charges

The maximum brokerage chargeable by a trading member in relation to trades effected in the contracts admitted to dealing on the F&O segment of NSE is fixed at 2.5% of the contract value in case of index futures and stock futures. In case of index options and stock options it is 2.5% of notional value of the contract [(Strike Price + Premium) * Quantity)], exclusive of statutory levies. The transaction charges payable to the exchange by the trading member for the trades executed by him on the F&O segment are fixed at the rate of Rs. 2 per

lakh of turnover (0.002%) subject to a minimum of Rs. 1,00,000 per year. However for the transactions in the options sub-segment the transaction charges are levied on the premium value at the rate of 0.05% (each side) instead of on the strike price as levied earlier. Further to this, trading members have been advised to charge brokerage from their clients on the Premium price(traded price) rather than Strike price. The trading members contribute to Investor Protection Fund of F&O segment at the rate of Re. 1/- per Rs. 100 crores of the traded value (each side).

5.3.3 Adjustments for corporate actions

The basis for any adjustment for corporate actions is such that the value of the position of the market participants, on the cum and ex-dates for the corporate action, continues to remain the same as far as possible. This facilitates in retaining the relative status of positions, namely in-the-money, at-the-money and out-of-money. This also addresses issues related to exercise and assignments.

Corporate actions can be broadly classified under stock benefits and cash benefits. The various stock benefits declared by the issuer of capital are bonus, rights, merger/de-merger, amalgamation, splits, consolidations, hive-off, warrants and secured premium notes (SPNs) among others. The cash benefit declared by the issuer of capital is cash dividend.

Any adjustment for corporate actions is carried out on the last day on which a security is traded on a cum basis in the underlying equities market, after the close of trading hours. Adjustments may entail modifications to positions and/or contract specifications as listed below, such that the basic premise of adjustment laid down above is satisfied:

1. Strike price
2. Position
3. Market lot/multiplier

The adjustments are carried out on any or all of the above, based on the nature of the corporate action. The adjustments for corporate actions are carried out on all open, exercised as well as assigned positions.

5.3.4 Eligibility criteria for securities/indices traded in F&O

Eligibility criteria of stocks

- The stock is chosen from amongst the top 500 stocks in terms of average daily market capitalisation and average daily traded value in the previous six months on a rolling basis.
- The stock's median quarter-sigma order size over the last six months should be not less than Rs. 1 lakh. For this purpose, a stock's quarter-sigma order size should mean the order size (in value terms) required to cause a change in the stock price equal to one-quarter of a standard deviation.

- The market wide position limit in the stock should not be less than Rs.50 crore. The market wide position limit (number of shares) is valued taking the closing prices of stocks in the underlying cash market on the date of expiry of contract in the month. The market wide position limit of open position (in terms of the number of underlying stock) on futures and option contracts on a particular underlying stock should be lower of:
  - 20% of the number of shares held by non-promoters in the relevant underlying security i.e. free-float holding.
- If an existing security fails to meet the eligibility criteria for three months consecutively, then no fresh month contract will be issued on that security.
- However, the existing unexpired contracts can be permitted to trade till expiry and new strikes can also be introduced in the existing contract months.

For unlisted companies coming out with initial public offering, if the net public offer is Rs.500 crores or more, then the exchange may consider introducing stock options and stock futures on such stocks at the time of its listing in the cash market.

Eligibility criteria of indices

The exchange may consider introducing derivative contracts on an index if the stocks contributing to 80% weightage of the index are individually eligible for derivative trading. However, no single ineligible stocks in the index should have a weightage of more than 5% in the index. The above criteria is applied every month, if the index fails to meet the eligibility criteria for three months consecutively, then no fresh month contract would be issued on that index, However, the existing unexpired contacts will be permitted to trade till expiry and new strikes can also be introduced in the existing contracts.

Eligibility criteria of stocks for derivatives trading especially on account of corporate restructuring

The eligibility criteria for stocks for derivatives trading on account of corporate restructuring is as under:

I. All the following conditions shall be met in the case of shares of a company undergoing restructuring through any means for eligibility to reintroduce derivative contracts on that company from the first day of listing of the post restructured company/(s) (as the case may be) stock (herein referred to as post restructured company) in the underlying market,
   a) the Futures and options contracts on the stock of the original (pre restructure) company were traded on any exchange prior to its restructuring;
   b) the pre restructured company had a market capitalisation of at least Rs.1000 crores prior to its restructuring;

c) the post restructured company would be treated like a new stock and if it is, in the opinion of the exchange, likely to be at least one-third the size of the pre restructuring company in terms of revenues, or assets, or (where appropriate) analyst valuations; and

d) in the opinion of the exchange, the scheme of restructuring does not suggest that the post restructured company would have any characteristic (for example extremely low free float) that would render the company ineligible for derivatives trading.

II. If the above conditions are satisfied, then the exchange takes the following course of action in dealing with the existing derivative contracts on the pre-restructured company and introduction of fresh contracts on the post restructured company

a) In the contract month in which the post restructured company begins to trade, the Exchange introduce near month, middle month and far month derivative contracts on the stock of the restructured company.

b) In subsequent contract months, the normal rules for entry and exit of stocks in terms of eligibility requirements would apply. If these tests are not met, the exchange shall not permit further derivative contracts on this stock and future month series shall not be introduced.

5.3.5 Products and Contract specifications

The F&O segment of NSE provides trading facilities for the following derivative products/ instruments:

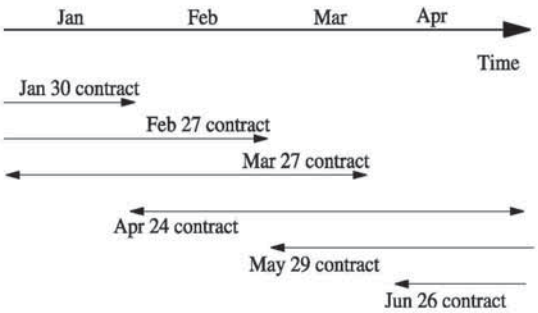
1. Index futures
2. Index options
3. Individual stock options
4. Individual stock futures

Index futures

NSE allows trading in individual stock & index based futures and option contracts having one-month, two-month and three-month expiry cycles. All contracts expire on the last Thursday of every month. Thus a January expiration contract would expire on the last Thursday of January and a February expiry contract would cease trading on the last Thursday of February. On the Friday following the last Thursday, a new contract having a three-month expiry would be introduced for trading. Thus, as shown in Figure 5A at any point in time, three contracts would be available for trading with the first contract expiring on the last Thursday of that month. Depending on the time period for which you want to take an exposure in index futures contracts, you can place buy and sell orders in the respective contracts.

Figure 5A Contract cycle

The figure shows the contract cycle for futures contracts on NSE's derivatives market. As can be seen, at any given point of time, three contracts are available for trading - a near-month, a middle-month and a far-month. As the January contract expires on the last Thursday of the month, a new three-month contract starts trading from the following day, once more making available three index futures contracts for trading.



The Instrument type 'FUTIDX' refers to 'Futures contract on index' and Contract symbol – 'NIFTY' denotes a 'Futures contract on Nifty index' and the Expiry date represents the last date on which the contract will be available for trading. Each futures contract has a separate limit order book. All passive orders are stacked in the system in terms of price-time priority and trades take place at the passive order price (similar to the existing capital market trading system). The best buy order for a given futures contract will be the order to buy the index at the highest index level whereas the best sell order will be the order to sell the index at the lowest index level.

Table 5.5 Contract specification: S&P CNX Nifty Futures	
Underlying index	S&P CNX Nifty
Exchange of trading	National Stock Exchange of India Limited
Security descriptor	FUTIDX NIFTY
Contract size	Permitted lot size shall be 50
	(minimum value Rs.2 lakh)
Price steps	Re. 0.05
Price bands	Not applicable
Trading cycle	The futures contracts will have a maximum of three month trading cycle - the near month (one), the next month(two) and the far month(three). New contract will be introduced on the next trading day following the Expiry of near month contract.
Expiry day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday
Settlement basis	Mark to market and final settlement will be cash settled on T+1 basis.
Settlement price	Daily settlement price will be the closing price of the futures contracts for the trading day and the final settlement price shall be the closing value of the underlying index on the last trading day.

Index Options

On NSE's index options market, there are one-month, two-month and three-month expiry contracts with minimum nine different strikes available for trading. Hence, if there are three serial month contracts available and the scheme of strikes is 6-1-6, then there are minimum 3 x 13 x 2 (call and put options) i.e. 78 options contracts available on an index. Option contracts are specified as follows: DATE-EXPIRYMONTH-YEAR-CALL/PUT- EUROPEAN-STRIKE. For example the European style call option contract on the Nifty index with a strike price of 2040 expiring on the 30th June 2005 is specified as '30 JUN 2005 2040 CE'.

Just as in the case of futures contracts, each option product (for instance, the 28 JUN 2005 2040 CE) has it's own order book and it's own prices. All index options contracts are cash settled and expire on the last Thursday of the month. The clearing corporation does the novation. The minimum tick for an index options contract is 0.05 paise.

Table 5.6 gives the contract specifications for index options trading on the NSE.

Table 5.6 Contract specification: S&P CNX Nifty Options	
Underlying index	S&P CNX Nifty
Exchange of trading	National Stock Exchange of India Limited
Security descriptor	OPTIDX NIFTY
Contract size	Permitted lot size shall be 50 (minimum value Rs.2 lakh)
Price steps	Re. 0.05
Price bands	Not applicable
Trading cycle	The options contracts will have a maximum of three month trading cycle - the near month (one), the next month (two) and the far month (three). New contract will be introduced on the next trading day following the expiry of near month contract.
Expiry day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday.
Settlement basis	Cash settlement on T+1 basis.
Style of option	European
Daily settlement price	N.A
Final settlement price	Closing value of the index on the last trading day of the options contract

Stock Futures

Trading in stock futures commenced on the NSE from November 2001. These contracts are cash settled on a T+1 basis. The expiration cycle for stock futures is the same as for index futures, index options and stock options. A new contract is introduced on the trading day following the expiry of the near month contract.

Table 5.7 gives the contract specifications for stock futures.

Table 5.7 Contract specification: Stock futures	
Underlying	Individual securities
Exchange of trading	National Stock Exchange of India Limited
Security descriptor	FUTSTK
Contract size	As specified by the exchange (minimum value of Rs.2 lakh)
Price steps	Re. 0.05
Price bands	Not applicable
Trading cycle	The futures contracts will have a maximum of three month trading cycle - the near month (one), the next month (two) and the far month (three). New contract will be introduced on the next trading day following the expiry of near month contract.
Expiry day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday.
Settlement	In Cash on T+1 Basis
Settlement price	Daily settlement price will be the closing price of the futures contracts on the trading day and the the final settlement price will be the closing price of the the underlying on the last trading day of the options contract.

Stock Options

Trading in stock options commenced on the NSE from July 2001. These contracts are European style and are settled in cash. The expiration cycle for stock options is the same as for index futures and index options. A new contract is introduced on the trading day following the expiry of the near month contract. NSE provides a minimum of seven strike prices for every option type (i.e. call and put) during the trading month. There are at least three in-the-money contracts, three out-of-the-money contracts and one at-the-money contract available for trading.

Table 5.8 gives the contract specifications for stock options.

Table 5.8 Contract specification: Stock options	
Underlying	Individual securities available
	for trading in cash market
Exchange of trading	National Stock Exchange of India Limited
Security descriptor	OPTSTK.
Style of option	European
Strike price interval	As specified by the exchange
Contract size	As specified by the exchange (minimum value of Rs.2 lakh)
Price steps	Re. 0.05

Table 5.8 Contract specification: Stock options	
Price bands	Not applicable
Trading cycle	The options contracts will have a maximum of three month trading cycle - the near month (one), the next month(two) and the far month(three). New contract will be be introduced on the next trading day following the expiry of near month contract.
Expiry day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday.
Settlement basis	T+1 Basis
Daily settlement price	Closing price of underlying on the day of exercise
Final settlement price	Closing price of underlying on the last trading day of the options contract
Settlement day	Last trading day

5.4 CLEARING AND SETTLEMENT

5.4.1 Introduction

National Securities Clearing Corporation Limited (NSCCL) undertakes clearing and settlement of all trades executed on the futures and options (F&O) segment of the NSE. It also acts as legal counterparty to all trades on the F&O segment and guarantees their financial settlement. Clearing and settlement activities in the *F&O segment* are undertaken by NSCCL with the help of the following entities:

- ***Clearing members*:** Primarily, the Clearing Member (CM) performs the following functions:

    1. *Clearing*: Computing obligations of all his TM's i.e. determining positions to settle.
    2. *Settlement*: Performing actual settlement. Currently, all the Futures and Options contracts are cash settled.
    3. *Risk Management*: Setting position limits based on upfront deposits/margins for each TM and monitoring positions on a continuous basis.

In the F&O segment, some members, called ***self clearing*** members, clear and settle their trades executed by them only either on their own account or on account of their clients. Some are called **trading member–cum–clearing member (TM-CM)**, who clear and settle their own trades as well as trades of other trading members (TMs). Besides, there is a special category of members, called **professional clearing members (PCM)** who clear and settle trades executed by TMs but do not trade themselves. The members clearing their own trades and trades of others, and the PCMs are required to bring in additional security deposits in respect of every TM whose trades they undertake to clear and settle.

Clearing Member Eligibility Norms

a. Net worth of atleast Rs.300 lakh. The net worth requirement for a CM who clears and settles only deals executed by him is Rs. 100 lakh.

b. Deposit of Rs. 50 lakh to NSCCL which forms the Base Minimum Capital (BMC) of the CM.

c. Additional incremental deposits of Rs.10 lakh to NSCCL for each additional TM in case the CM undertakes to clear and settle deals for other TMs.

- ***Clearing banks*:** Funds settlement takes place through clearing banks. For the purpose of settlement all clearing members are required to open a separate bank account with NSCCL designated clearing bank for F&O segment. The Clearing and Settlement process comprises of the following three main activities:
  1) Clearing
  2) Settlement
  3) Risk Management

5.4.2 Clearing mechanism

The first step in clearing process is working out open positions and obligations of clearing (self-clearing/trading-cum-clearing/professional clearing) members (CMs). The open positions of a CM is arrived at by aggregating the open positions of all the trading members (TMs) and all custodial participants (CPs) clearing through him, in the contracts which they have traded. The open position of a TM is arrived at by summing up his proprietary open position and clients' open positions, in the contracts which they have traded. While entering orders on the trading system, TMs identify orders as either proprietary or client through 'Pro / Cli' indicator provided in the order entry screen. Proprietary positions are calculated on net basis (buy - sell) for each contract and that of clients are arrived at by summing together net positions of each individual client i.e., a buy trade is off-set by a sell trade and a sell trade is off-set by a buy trade. A TM's open position is the sum of proprietary open position, client open long position and client open short position.

5.4.3 Settlement mechanism

The settlement amount for a CM is netted across all their TMs/clients, with respect to their obligations on MTM, premium and exercise settlement.

Settlement of futures contracts on Index or Individual Securities

Futures contracts have two types of settlements, the MTM settlement which happens on a continuous basis at the end of each day, and the final settlement which happens on the last trading day of the futures contract.

MTM settlement: All futures contracts for each member are marked-to-market (MTM) to the daily settlement price of the relevant futures contract at the end of each day.

The CMs who have a loss are required to pay the mark-to-market (MTM) loss amount in cash which is in turn passed on to the CMs who have made a MTM profit. This is known as daily mark-to-market settlement. CMs are responsible to collect and settle the daily MTM profits/ losses incurred by the TMs and their clients clearing and settling through them. Similarly, TMs are responsible to collect/pay losses/profits from/to their clients by the next day. The pay-in and pay-out of the mark-to-market settlement are affected on the day following the trade day (T+1). The mark to market losses or profits are directly debited or credited to the CMs clearing bank account. In case a futures contract is not traded on a day, or not traded during the last half an hour, a 'theoretical settlement price' for unexpired futures contracts is computed as per the following formula:

$$F = S * e^{rT}$$

where
F = Theoretical futures price
S = Value of the underlying index
r = Cost of financing (using continuously compounded interest rate) or rate of interest (MIBOR)
T = Time till expiration
e = 2.71828

After completion of daily settlement computation, all the open positions are reset to the daily settlement price. Such positions become the open positions for the next day.

***Final settlement for futures*:** On the expiry day of the futures contracts, after the close of trading hours, NSCCL marks all positions of a CM to the final settlement price and the resulting profit/loss is settled in cash. Final settlement of future contracts is similar to the daily settlement process except for the method of computation of final settlement price. The final settlement profit / loss is computed as the difference between trade price or the previous day's settlement price, as the case may be, and the final settlement price of the relevant futures contract. Final settlement loss/profit amount is debited/ credited to the relevant CM's clearing bank account on the day following expiry day of the contract. Open positions in futures contracts cease to exist after their expiration day

Settlement prices for futures: Daily settlement price on a trading day is the closing price of the respective futures contracts on such day. The closing price for a futures contract is currently calculated as the last half an hour weighted average price of the contract in the F&O Segment of NSE. Final settlement price is the closing price of the relevant underlying index/ security in the capital market segment of NSE, on the last trading day of the contract.

Settlement of options contracts on Index or Individual Securities

Options contracts have two types of settlements, daily premium settlement and final exercise settlement.

Daily premium settlement

Buyer of an option is obligated to pay the premium towards the options purchased by him. Similarly, the seller of an option is entitled to receive the premium for the option sold by him. The premium payable amount and the premium receivable amount are netted to compute the net premium payable or receivable amount for each client for each option contract.

Final exercise settlement

Final exercise settlement is effected for all open long in-the-money strike price options existing at the close of trading hours, on the expiration day of an option contract. All such long positions are exercised and automatically assigned to short positions in option contracts with the same series, on a random basis. The investor who has long in-the-money options on the expiry date will receive the exercise settlement value per unit of the option from the investor who is short on the option.

Exercise process

The period during which an option is exercisable depends on the style of the option. On NSE, index options and options on securities are European style, i.e. options are only subject to automatic exercise on the expiration day, if they are in-the-money. Automatic exercise means that all in-the-money options would be exercised by NSCCL on the expiration day of the contract. The buyer of such options need not give an exercise notice in such cases.

Exercise settlement computation

In case of option contracts, all open long positions at in-the-money strike prices are automatically exercised on the expiration day and assigned to short positions in option contracts with the same series on a random basis. Final exercise is automatically effected by NSCCL for all open long in-the-money positions in the expiring month option contract, on the expiry day of the option contract. The exercise settlement price is the closing price of the underlying (index or security) on the expiry day of the relevant option contract. The exercise settlement value is the difference between the strike price and the final settlement price of the relevant option contract. For call options, the exercise settlement value receivable by a buyer is the difference between the final settlement price and the strike price for each unit of the underlying conveyed by the option contract, while for put options it is difference between the strike price and the final settlement price for each unit of the underlying conveyed by the option contract. Settlement of exercises of options is currently by payment in cash and not by delivery of securities.

The exercise settlement value for each unit of the exercised contract is computed as follows:
Call options = Closing price of the security on the day of exercise — Strike price
Put options = Strike price — Closing price of the security on the day of exercise

The closing price of the underlying security is taken on the expiration day. The exercise settlement value is debited / credited to the relevant CMs clearing bank account on T + 1 day (T = exercise date).

Special facility for settlement of institutional deals

NSCCL provides a special facility to Institutions/Foreign Institutional Investors (FIIs)/Mutual Funds etc. to execute trades through any TM, which may be cleared and settled by their own CM. Such entities are called custodial participants (CPs). To avail of this facility, a CP is required to register with NSCCL through his CM. A unique CP code is allotted to the CP by NSCCL. All trades executed by a CP through any TM are required to have the CP code in the relevant field on the trading system at the time of order entry. Such trades executed on behalf of a CP are confirmed by their own CM (and not the CM of the TM through whom the order is entered), within the time specified by NSE on the trade day though the on-line confirmation facility. Till such time the trade is confirmed by CM of concerned CP, the same is considered as a trade of the TM and the responsibility of settlement of such trade vests with CM of the TM. Once confirmed by CM of concerned CP, such CM is responsible for clearing and settlement of deals of such custodial clients. FIIs have been permitted to trade subject to compliance of the position limits prescribed for them and their sub-accounts, and compliance with the prescribed procedure for settlement and reporting. A FII/a sub-account of the FII, as the case may be, intending to trade in the F&O segment of the exchange, is required to obtain a unique Custodial Participant (CP) code allotted from the NSCCL. FII/sub-accounts of FIIs which have been allotted a unique CP code by NSCCL are only permitted to trade on the F&O segment.

5.4.4 Risk management

NSCCL has developed a comprehensive risk containment mechanism for the F&O segment. Risk containment measures include capital adequacy requirements of members, monitoring of member performance and track record, stringent margin requirements, position limits based on capital, online monitoring of member positions and automatic disablement from trading when limits are breached. The salient features of risk containment mechanism on the F&O segment are:

There are stringent requirements for members in terms of capital adequacy measured in terms of net worth and security deposits.

1. NSCCL charges an upfront initial margin for all the open positions of a CM. It specifies the initial margin requirements for each futures/options contract on a daily basis. The CM in turn collects the initial margin from the TMs and their respective clients.
2. Client margins: NSCCL intimates all members of the margin liability of each of their

client. Additionally members are also required to report details of margins collected from clients to NSCCL, which holds in trust client margin monies to the extent reported by the member as having been collected form their respective clients.

3. The open positions of the members are marked to market based on contract settlement price for each contract. The difference is settled in cash on a T+1 basis.
4. NSCCL's on-line position monitoring system monitors a CM's open positions on a real-time basis. Limits are set for each CM based on his capital deposits. The on-line position monitoring system generates alerts whenever a CM reaches a position limit set up by NSCCL. At 100% the clearing facility provided to the CM shall be withdrawn. Withdrawal of clearing facility of a CM in case of a violation will lead to withdrawal of trading facility for all TMs and/ or custodial participants clearing and settling through the CM
5. CMs are provided a trading terminal for the purpose of monitoring the open positions of all the TMs clearing and settling through him. A CM may set exposure limits for a TM clearing and settling through him. NSCCL assists the CM to monitor the intra-day exposure limits set up by a CM and whenever a TM exceed the limits, it stops that particular TM from further trading. Further trading members are monitored based on positions limits. Trading facility is withdrawn when the open positions of the trading member exceeds the position limit.
6. A member is alerted of his position to enable him to adjust his exposure or bring in additional capital..
7. A separate settlement guarantee fund for this segment has been created out of the capital of members.

The most critical component of risk containment mechanism for F&O segment is the margining system and on-line position monitoring. The actual position monitoring and margining is carried out on-line through Parallel Risk Management System (PRISM). PRISM uses SPAN(r) (Standard Portfolio Analysis of Risk) system for the purpose of computation of on-line margins, based on the parameters defined by SEBI.

NSCCL-SPAN

The objective of NSCCL-SPAN is to identify overall risk in a portfolio of all futures and options contracts for each member. The system treats futures and options contracts uniformly, while at the same time recognizing the unique exposures associated with options portfolios, like extremely deep out-of-the-money short positions and inter-month risk. Its over-riding objective is to determine the largest loss that a portfolio might reasonably be expected to suffer from one day to the next day based on 99% VaR methodology.

Types of margins

The margining system for F&O segment is explained below:

- Initial margin: Margin in the F&O segment is computed by NSCCL upto client level for open positions of CMs/TMs. These are required to be paid up-front on gross basis at individual client level for client positions and on net basis for proprietary positions. NSCCL collects initial margin for all the open positions of a CM based on the margins computed by NSE-SPAN. A CM is required to ensure collection of adequate initial margin from his TMs and his respective clients. The TM is required to collect adequate initial margins up-front from his clients.
- Premium margin: In addition to initial margin, premium margin is charged at client level. This margin is required to be paid by a buyer of an option till the premium settlement is complete.
- Assignment margin: Assignment margin is levied in addition to initial margin and premium margin. It is required to be paid on assigned positions of CMs towards exercise settlement obligations for option contracts, till such obligations are fulfilled. The margin is charged on the net exercise settlement value payable by a CM.

5.5 Margining System

NSCCL has developed a comprehensive risk containment mechanism for the Futures & Options segment. The most critical component of a risk containment mechanism is the online position monitoring and margining system. The actual margining and position monitoring is done on-line, on an intra-day basis using PRISM (Parallel Risk Management System) which is the real-time position monitoring and risk management system. The risk of each trading and clearing member is monitored on a real-time basis and alerts/disablement messages are generated if the member crosses the set limits.

5.5.1 SPAN approach of computing initial margins

The objective of SPAN is to identify overall risk in a portfolio of futures and options contracts for each member. The system treats futures and options contracts uniformly, while at the same time recognizing the unique exposures associated with options portfolios like extremely deep out-of-the-money short positions, inter-month risk and inter-commodity risk.

Because SPAN is used to determine performance bond requirements (margin requirements), its overriding objective is to determine the largest loss that a portfolio might reasonably be expected to suffer from one day to the next day.

In standard pricing models, three factors most directly affect the value of an option at a given point in time:

1. Underlying market price
2. Volatility (variability) of underlying instrument
3. Time to expiration

As these factors change, so too will the value of futures and options maintained within a portfolio. SPAN constructs sixteen scenarios of probable changes in underlying prices and

volatilities in order to identify the largest loss a portfolio might suffer from one day to the next. It then sets the margin requirement at a level sufficient to cover this one-day loss.

The computation of worst scenario loss has two components. The first is the valuation of each contract under sixteen scenarios. The second is the application of these scenario contract values to the actual positions in a portfolio to compute the portfolio values and the worst scenario loss. The scenario contract values are updated at least 5 times in the day, which may be carried out by taking prices at the start of trading, at 11:00 a.m., at 12:30 p.m., at 2:00 p.m., and at the end of the trading session.

5.5.2 Mechanics of SPAN

The results of complex calculations (e.g. the pricing of options) in SPAN are called *risk arrays.* Risk arrays, and other necessary data inputs for margin calculation are then provided to members on a daily basis in a file called the SPAN Risk Parameter file. Members can apply the data contained in the risk parameter files, to their specific portfolios of futures and options contracts, to determine their SPAN margin requirements. SPAN has the ability to estimate risk for combined futures and options portfolios, and re-value the same under various scenarios of changing market conditions.

Risk arrays

The SPAN risk array represents how a specific derivative instrument (for example, an option on NIFTY index at a specific strike price) will gain or lose value, from the current point in time to a specific point in time in the near future, for a specific set of market conditions which may occur over this time duration.

The results of the calculation for each risk scenario i.e. the amount by which the futures and options contracts will gain or lose value over the look-ahead time under that risk scenario - is called the risk array value for that scenario. The set of risk array values for each futures and options contract under the full set of risk scenarios, constitutes the risk array for that contract.

In the risk array, losses are represented as positive values, and gains as negative values. Risk array values are represented in Indian Rupees, the currency in which the futures or options contract is denominated.

Risk scenarios

The specific set of market conditions evaluated by SPAN, are called the *risk scenarios,* and these are defined in terms of:

1. How much the price of the underlying instrument is expected to change over one trading day, and
2. How much the volatility of that underlying price is expected to change over one trading day.

SPAN further uses a standardized definition of the risk scenarios, defined in terms of:

1. The underlying *price scan range* or probable price change over a one day period, and
2. The underlying price *volatility scan range* or probable volatility change of the underlying over a one day period.

The below table gives the sixteen risk scenarios. +1 refers to increase in volatility and -1 refers to decrease in volatility.

Table : Worst scenario loss

Risk scenario number	Price move in multiples of price scan range	Volatility move multiples of volatility range	Fraction of loss considered (%)
1	0	+1	100
2	0	-1	100
3	+1/3	+1	100
4	+1/3	-1	100
5	-1/3	+1	100
6	-1/3	-1	100
7	+2/3	+1	100
8	+2/3	-1	100
9	-2/3	+1	100
10	-2/3	-1	100
11	+1	+1	100
12	+1	-1	100
13	-1	+1	100
14	-1	-1	100
15	+2	0	35
16	-2	0	35

Method of computation of volatility

The exponential moving average method is used to obtain the volatility estimate every day. The estimate at the end of day t, σ_t is estimated using the previous day's volatility estimate σ_{t-1} (as at the end of day t-1), and the return r_t observed in the futures market on day t.

$$(\sigma_t^2) = \lambda(\sigma_{t-1})^2 + (1-\lambda)(r_t)^2$$

where λ is a parameter which determines how rapidly volatility estimates change. A value of 0.94 is used for λ.

SPAN uses the risk arrays to scan probable underlying market price changes and probable

volatility changes for all contracts in a portfolio, in order to determine value gains and losses at the portfolio level. This is the single most important calculation executed by the system.

Scanning risk charge

As shown in the table giving the sixteen standard risk scenarios, SPAN starts at the last underlying market settlement price and scans up and down three even intervals of price changes (price scan range). At each price scan point, the program also scans up and down a range of probable volatility from the underlying market's current volatility (volatility scan range). SPAN calculates the probable premium value at each price scan point for volatility up and volatility down scenario. It then compares this probable premium value to the theoretical premium value (based on last closing value of the underlying) to determine profit or loss.

Deep-out-of-the-money short options positions pose a special risk identification problem. As they move towards expiration, they may not be significantly exposed to "normal" price moves in the underlying. However, unusually large underlying price changes may cause these options to move into-the-money, thus creating large losses to the holders of short option positions. In order to account for this possibility, two of the standard risk scenarios in the risk array, Number 15 and 16, reflect an "extreme" underlying price movement, currently defined as double the maximum price scan range for a given underlying. However, because price changes of these magnitudes are rare, the system only covers 35% of the resulting losses.

After SPAN has scanned the 16 different scenarios of underlying market price and volatility changes, it selects the largest loss from among these 16 observations. This "largest reasonable loss" is the *scanning risk charge* for the portfolio.

Calendar spread margin

A calendar spread is a position in an underlying with one maturity which is hedged by an offsetting position in the same underlying with a different maturity: for example, a short position in a July futures contract on Reliance and a long position in the August futures contract on Reliance is a calendar spread. Calendar spreads attract lower margins because they are not exposed to market risk of the underlying. If the underlying rises, the July contract would make a loss while the August contract would make a profit.

As SPAN scans futures prices within a single underlying instrument, it assumes that price moves correlate perfectly across contract months. Since price moves across contract months do not generally exhibit perfect correlation, SPAN adds an *calendar spread charge* (also called the inter-month spread charge) to the scanning risk charge associated with each futures and options contract. To put it in a different way, the calendar spread charge covers the calendar basis risk that may exist for portfolios containing futures and options with different expirations.

For each futures and options contract, SPAN identifies the delta associated each futures and

option position, for a contract month. It then forms spreads using these deltas across contract months. For each spread formed, SPAN assesses a specific charge per spread which constitutes the calendar spread charge.

The margin for calendar spread is calculated on the basis of delta of the portfolio in each month. Thus a portfolio consisting of a near month option with a delta of 100 and a far month option with a delta of 100 would bear a spread charge equivalent to the calendar spread charge for a portfolio which is long 100 near month futures contract and short 100 far month futures contract. A calendar spread position on Exchange traded equity derivatives may be granted calendar spread treatment till the expiry of the near month contract.

Margin on calendar spreads is levied at 0.5% per month of spread on the far month contract of the spread subject to a minimum margin of 1% and a maximum margin of 3% on the far month contract of the spread.

Short option minimum margin

Short options positions in extremely deep-out-of-the-money strikes may appear to have little or no risk across the entire scanning range. However, in the event that underlying market conditions change sufficiently, these options may move into-the-money, thereby generating large losses for the short positions in these options. To cover the risks associated with deep-out-of-the-money short options positions, SPAN assesses a minimum margin for each short option position in the portfolio called the *short option minimum charge,* which is set by the NSCCL. The short option minimum charge serves as a minimum charge towards margin requirements for each short position in an option contract.

For example, suppose that the short option minimum charge is Rs.50 per short position. A portfolio containing 20 short options will have a margin requirement of at least Rs. 1,000, even if the scanning risk charge plus the calendar spread charge on the position is only Rs. 500.

The short option minimum margin equal to 3% of the notional value of all short index options is charged if sum of the worst scenario loss and the calendar spread margin is lower than the short option minimum margin. For stock options it is equal to 7.5% of the notional value based on the previous days closing value of the underlying stock. Notional value of option positions is calculated on the short option positions by applying the last closing price of the relevant underlying.

Net option value

The net option value is calculated as the current market value of the option times the number of option units (positive for long options and negative for short options) in the portfolio.

Net option value is added to the liquid net worth of the clearing member. This means that the current market value of short options are deducted from the liquid net worth and the market

value of long options are added thereto. Thus mark to market gains and losses on option positions get adjusted against the available liquid net worth.

Net buy premium

To cover the one day risk on long option positions (for which premium shall be payable on T+1 day), net buy premium to the extent of the net long options position value is deducted from the Liquid Networth of the member on a real time basis. This would be applicable only for trades done on a given day. The net buy premium margin shall be released towards the Liquid Networth of the member on T+1 day after the completion of pay-in towards premium settlement.

Overall portfolio margin requirement

The total margin requirements for a member for a portfolio of futures and options contract would be computed by SPAN as follows:

1. Adds up the scanning risk charges and the calendar spread charges.
2. Compares this figure to the short option minimum charge and selects the larger of the two. This is the SPAN risk requirement.
3. Total SPAN margin requirement is equal to SPAN risk requirement less the net option value, which is mark to market value of difference in long option positions and short option positions.
4. Initial margin requirement = Total SPAN margin requirement + Net Buy Premium.

5.5.3 Cross Margining

Cross margining benefit is provided for off-setting positions at an individual client level in equity and equity derivatives segment. The cross margin benefit is provided on following offsetting positions-

a. Index Futures and constituent Stock Futures positions in F&O segment
b. Index futures position in F&O segment and constituent stock positions in CM segment
c. Stock futures position in F&O segment and stock positions in CM segment
    1. In order to extend the cross margining benefit as per (a) and (b) above, the basket of constituent stock futures/ stock positions needs to be a complete replica of the index futures.
    2. The positions in F&O segment for stock futures and index futures of the same expiry month are eligible for cross margining benefit.
    3. The position in a security is considered only once for providing cross margining benefit. E.g. Positions in Stock Futures of security A used to set-off against index futures positions is not considered again if there is a off-setting positions in the security A in Cash segment.

4. Positions in option contracts are not considered for cross margining benefit.

The positions which are eligible for offset are subjected to spread margins. The spread margins shall be 25% of the applicable upfront margins on the offsetting positions.

Prior to the implementation of a cross margining mechanism positions in the equity and equity derivatives segment were been treated separately, despite being traded on the common underlying securities in both the segments. For example, Mr. X bought 100 shares of a security A in the capital market segment and sold 100 shares of the same security in single stock futures of the F&O segment. Margins were payable in the capital market and F&O segments separately. If the margins payable in the capital market segment is Rs.100 and in the F&O segment is Rs.140, the total margin payable by Mr. X is Rs.240. The risk arising out of the open position of Mr. X in the capital market segment is significantly mitigated by the corresponding off-setting position in the F&O segment. Cross margining mechanism reduces the margin for Mr. X from Rs. 240 to only Rs. 60.

Trading Member-wise Position Limit

Trading member position limits are specified as given below:

1. Trading member position limits in equity index option contracts: The trading member position limits in equity index option contracts is higher of Rs.500 crore or 15% of the total open interest in the market in equity index option contracts. This limit is applicable on open positions in all option contracts on a particular underlying index.

2. Trading member position limits in equity index futures contracts: The trading member position limits in equity index futures contracts is higher of Rs.500 crore or 15% of the total open interest in the market in equity index futures contracts. This limit is applicable on open positions in all futures contracts on a particular underlying index.

3. Trading member position limits for combined futures and options position:

   - For stocks having applicable market-wise position limit(MWPL) of Rs.500 crores or more, the combined futures and options position limit is 20% of applicable MWPL or Rs.300 crores, whichever is lower and within which stock futures position cannot exceed 10% of applicable MWPL or Rs.150 crores, whichever is lower.

   - For stocks having applicable market-wise position limit (MWPL) less than Rs.500 crores, the combined futures and options position limit is 20% of applicable MWPL and futures position cannot exceed 20% of applicable MWPL or Rs.50 crore which ever is lower. The Clearing Corporation shall specify the trading member-wise position limits on the last trading day month which shall be reckoned for the purpose during the next month.

Client level position limits

The gross open position for each client, across all the derivative contracts on an underlying, should not exceed 1% of the free float market capitalization (in terms of number of shares) or 5% of the open interest in all derivative contracts in the same underlying stock (in terms of number of shares) whichever is higher.

Market wide position limits

The market wide limit of open position (in terms of the number of underlying stock) on futures and option contracts on a particular underlying stock is 20% of the number of shares held by non-promoters in the relevant underlying security i.e. free–float holding. This limit is applicable on all open positions in all futures and option contracts on a particular underlying stock. The enforcement of the market wide limits is done in the following manner:

- At end of the day the exchange tests whether the market wide open interest for any scrip exceeds 95% of the market wide position limit for that scrip. In case it does so, the exchange takes note of open position of all client/TMs as at end of that day for that scrip and from next day onwards they can trade only to decrease their positions through offsetting positions.
- At the end of each day during which the ban on fresh positions is in force for any scrip, the exchange tests whether any member or client has increased his existing positions or has created a new position in that scrip. If so, that client is subject to a penalty equal to a specified percentage (or basis points) of the increase in the position (in terms of notional value). The penalty is recovered before trading begins next day. The exchange specifies the percentage or basis points, which is set high enough to deter violations of the ban on increasing positions.
- The normal trading in the scrip is resumed after the open outstanding position comes down to 80% or below of the market wide position limit. Further, the exchange also checks on a monthly basis, whether a stock has remained subject to the ban on new position for a significant part of the month consistently for three months. If so, then the exchange phases out derivative contracts on that underlying.

The performance of derivatives markets can be analysed on the basis of various parameters like prices, turnover, open interest and cost of carry. The interplay of prices, volumes and open interest indicates the health of the market. Generally, if prices, volumes and open interest are rising, the market is healthy. If the prices are rising, while volume and open interest are falling, then the market is weakening.

Open Interest

Open interest is the total number of outstanding contracts that are held by market participants at the end of each day. Putting it simply, open interest is a measure of how much interest

is there in a particular option or future. Increasing open interest means that fresh funds are flowing in the market, while declining open interest means that the market is liquidating.

Implied Interest Rate

In the futures market, implied interest rate or cost of carry is often used inter-changeably. Cost of carry is more appropriately used for commodity futures, as by definition it means the total costs required to carry a commodity or any other good forward in time. The costs involved are storage cost, insurance cost, transportation cost, and the financing cost. In case of equity futures, the carry cost is the cost of financing minus the dividend returns. Assuming zero dividend, the only relevant factor is the cost of financing.

One could work out the implied interest rate incorporated in futures prices, which is the percentage difference between the future value of an index and the spot value, annualised on the basis of the number of days before the expiry of the contract. Carry cost or implied interest rate plays an important role in determining the price differential between the spot and the futures market. By comparing the implied interest rate and the existing interest rate level, one can determine the relative cost of futures' market price. Implied interest rate is also a measure of profitability of an arbitrage position. Theoretically, if the futures price is less than the spot price plus cost of carry or if the futures price is greater than the spot price plus cost of carry, arbitrage opportunities exist.

Nifty futures close prices for the near month contracts, which are most liquid, and the spot Nifty close values from June 2000 to June 2001. The difference between the future price and the spot price is called *basis*. As the time to expiration of a contract reduces, the basis reduces.

Implied Volatility

Volatility is one of the important factors, which is taken into account while pricing options. It is a measure of the amount and speed of price changes, in either direction. Everybody would like to know what future volatility is going to be. Since it is not possible to know future volatility, one tries to estimate it. One way to do this is to look at historical volatility over a certain period of time and try to predict the future movement of the underlying. Alternatively, one could work out implied volatility by entering all parameters into an option pricing model and then solving for volatility. For example, the Black Scholes model solves for the fair price of the option by using the following parameters – days to expiry, strike price, spot price, volatility of underlying, interest rate, and dividend. This model could be used in reverse to arrive at implied volatility by putting the current price of the option prevailing in the market.

Putting it simply, implied volatility is the market's estimate of how volatile the underlying will be from the present until the option's expiration, and is an important input for pricing options - when volatility is high, options premiums are relatively expensive; when volatility is low, options premiums are relatively cheap. However, implied volatility estimate can be

biased, especially if they are based upon options that are thinly traded. Options trading was introduced at NSE only in June 2001. The data points are therefore quite limited to enable meaningful estimates of implied volatility.

MODEL QUESTIONS

Ques.1 The underlying asset of a derivative contract can be _____.

(a) only equity (b) only interest rate

(c) only commodities (d) all of the above

Correct answer: (d)

Ques.2 The losses of option buyer are _____.

(a) unlimited

(b) limited to the extent of premium paid

(c) generally larger than the premium paid

(d) None of the above

Correct answer: (b)

Ques.3 In the F&O trading system, execution priority of orders stored in the order book is based on:

(a) Time price priority (i.e. first priority is given to the time of the order entry)

(b) Price time priority(i.e. first priority is given to the price of the order entry)

(c) Both price and time is given equal priority

(d) The first order which comes to the system will get executed first irrespective of the price of the order.

Correct Answer: (b)

Ques:4 The minimum tick for an index options contract is:

(a) 0.01 Paise (b) 0.05 Paise

(c) 0.10 Paise (d) 0.50 Paise

Correct Answer: (b)

Ques:5 The stock options contracts traded at NSE are of _____.

(a) American Style (b) Asian Style

(c) Indian Style (d) European Style

Correct answer: (d)

Ques:6 The trading cycle for Index futures contracts may be described as:

(a) The contracts with a maximum of three month trading cycle-the near month (one), the next month (two) and the far month (three).

(b) The contracts with a maturity period of one year with three months continuous contracts for the first three months and fixed quarterly contracts for the entire year

(c) The contracts with a maturity period of one year, with fixed quarterly contracts only.

(d) None of the above.

Correct answer: (a)

Ques:7 Which of the following is false regarding the eligibility of a stock to be traded in the F&O segment?

(a) The stock shall be chosen from amongst the top 500 stock in terms of average daily market capitalisation and average daily traded value in the previous six month on a rolling basis.

(b) For a security to be added in the F&O segment that stock's median quarter-sigma order size over the last six months shall be at least Rs.1 lakh.

(c) Once a security is introduced for trading in the derivatives segment, it will continue to be eligible for trading in derivatives segment, even if the median quarter-sigma order size of the security is less than Rs.5 lakh continuously.

(d) For unlisted companies coming out with initial public offering, if the net public offer is Rs.500 crore or more, then the exchanges may consider introducing stock options and stock futures on such stocks at the time of its listing in the cash market.

Correct answer: (c)

Ques:8 According to the Standard Pricing Models, what are the factors that affect value of an option at a given point in time?

(a) Underlying Market Price

(b) Volatility (variability) of underlying instrument

(c) Time to Expiration

(d) All of the above

Correct answer: (d)

Ques:9 For which of the following derivative products/instruments trading facilities on the F&O segment of NSE are not provided currently?

(a) Index options (b) Individual stock futures

(c) Interest rate futures (d) Currency Swaps.

Current answer: (d)

Ques:10 Which of the following order type/condition is not available in the F&O trading system at NSE?

(a) Market If Touched (MIT) (b) Day order

(c) Immediate or Cancel (IOC) (d) Stop-Loss orders.

Correct answer: (a)

Ques:11 Mr. Paul has placed a stop–loss buy order for the security XYZ Ltd, in the F&O trading system. The following are the details of the order: the trigger price is kept at Rs.1027.00 and the limit price is kept at Rs.1030.00. This order will be released into the system in which of the following scenarios:

(a) The market price of the security reaches or exceeds Rs.1027.00

(b) Only if the market price of the security reaches or exceeds Rs.1030.00

(c) Only if the market price of the security falls below Rs.1027.00

(d) The market price of the security reaches or exceeds Rs.1024.00

Correct answer: (a)

Ques:12 Revenue securities Ltd., a trading member in F&O segment has executed a client trade in options segment. Given the following details of the trade, what is the maximum brokerage the trading member can charge from the client for the above trade?

The Strike price of the contract is 250, Traded premium is 10 and The traded quantity is 800.

(a) Rs.520 (b) Rs.200

(c) Rs.5000 (d) Rs.5200

Correct answer: (d)

Ques:13 Spot value of Nifty is 1240. An investor buys a one month Nifty 1255 call option for a premium of Rs. 7. The option is said to be _____.

(a) in-the-money (b) at-the-money

(c) out-of-the-money (d) above-the money

Correct answer: (c)

Ques:14 A stock is current selling at Rs.70. The call option to buy the stock at Rs. 65 costs Rs. 12. What is the time value of the option?

(a) Rs. 7 (b) Rs. 5

(c) Rs. 4 (d) Rs. 2

Correct answer: (a)

CHAPTER 6 : MATHEMATICS AND STATISTICS

6.1 MEASURES OF CENTRAL TENDENCY

An average is a value that is typical, or representative, of a set of given data. Since such typical values tend to lie centrally within a set of data arranged according to magnitude, averages are also called measures of central tendency.

6.1.1 Mean

Mean is an average value of a set of the values. It indicates the central value of the overall population. It equals to the sum of all the values over (divided by) the number of observations. It is also known as arithmetic mean. The arithmetic mean, or briefly the mean, of a set of N numbers X^1, X^2, X^3,..., X^N is denoted by $\overline{X}$ (read "X bar") and is defined as:

$$\overline{X} = \frac{X_1 + X_2 + X_3 + ...X_N}{N} = \frac{\sum_{j=1}^{N} X_j}{N} = \frac{\sum X}{N}$$

Example 1: The arithmetic mean of the numbers 8, 3, 5, 12, and 10 is

$$\overline{X} = \frac{8+3+5+2+12+10}{5} = \frac{38}{5} = 7.6$$

6.1.2 The weighted Arithmetic mean.

The mean is computed either without weights or with weights. The weighted mean refer to assigning the weights ($w_1, w_2, ..., w_n$) to each value (X^1, X^2, X^3,..., X^N) multiplying them and summing such values. Each weight depends on the significance or importance attributed to each value. In this case,

$$\overline{X} = \frac{w_1 X_1 + w_2 X_2 + ... + w_n X_N}{w_1 + w_2 + ...w_n} = \frac{\sum wX}{\sum w}$$

is called the weighted arithmetic mean.

Example 2: If a final examination in a course, is weighted 3 times as much as each of the two internal assignments and a student has a final examination grade of 85 and internal assignment grades of 70 and 90, the mean grade is:

$$\overline{X} = \frac{(1)(70)+(1)(90)+(3)(85)}{1+1+3} = \frac{415}{5} = 83$$

Thus, it is simply sum of weighted value of each observation.

6.1.3 Geometric Mean

Geometric Mean (GM) is theoretically considered to be the best average in measuring returns from securities.

The geometric mean, G, of a set on N positive numbers $X_1, X_2, X_3, \ldots, X_n$ is the Nth root of the product of the numbers:

$$G = \sqrt[N]{X_1 X_2 X_3 \ldots . X_n}$$

Example 3: The geometric mean of the numbers 2, 4, and 8 is:

$G = \sqrt[3]{(2)(4)(8)} = \sqrt[3]{64} = 4.$

If there are two items, square root is taken; if there are three items, then cube root and so on. Geometric mean can be computed through logarithmic method or by using a calculator.

6.1.4 Variance and Standard Deviation

Variance: The occurrence of an event may deviate from the mean or an expected value. The spread of such occurrences around the expected value can be measured by variance. Thus, variance equals to average of squares of the deviation of each value from the mean. It may be expressed as:

$$\text{Variance} = s^2 = \text{OR } \sigma^2 = \frac{\sum_{j=1}^{N}(X_j - \overline{X})^2}{N} = \frac{\sum(X - \overline{X})^2}{N} = \frac{\sum x^2}{N}$$

where x represents the deviations of each of the numbers X^j from the mean $\overline{X}$.

Standard deviation has been used as a proxy measure for risk of a security. It measures the fluctuations around mean returns. It equals to the positive square root of variance.

$$\text{Standard deviation} = \sqrt{Variance} = \sigma \text{ / S} = \sqrt{\frac{\sum_{j=1}^{N}(X_j - \overline{X})^2}{N}} = \sqrt{\frac{\sum(X - \overline{X})^2}{N}}$$

Where it is necessary to distinguish the standard deviation of a population from the standard deviation of a sample drawn from this population, we often use the symbol '*s*' for the letter and 'σ'(lower case Greek sigma) for the former. Thus, 's^2'and 'σ^2' would represent the *sample variance* and *population variance*, respectively. Sometimes the standard deviation of a sample's data is defined with (N-1) replacing N in the denominations in above equations because the resulting value represents a better estimate for the standard deviation of a population from which the sample is taken. For large values of N (certainly N>30), there is practically no difference between the two definitions.

Example 5: The stock returns of the company A for past five years are 10%, 20% 5%, 30% and 35%. What is the standard deviation of the returns for the returns of the company A?

$$\overline{X} = \frac{10+20+5+30+35}{5} = 20$$

$$\sigma = \sqrt{\frac{\sum_{j=1}^{N}(X_j - \overline{X})^2}{N}}$$

$$\sigma = \sqrt{\frac{[(10-20)]^2 + [(20-20)]^2 + [(5-20)]^2 + [(30-20)]^2 + [(35-20)]^2}{5}}$$

$$\sigma = \sqrt{\frac{(-10)^2 + (0)^2 + (-15)^2 + (10)^2 + (15)^2}{5}} = \sqrt{\frac{100+0+225+100+225}{5}} = \sqrt{\frac{650}{5}}$$

$$\sigma = \sqrt{130} = 11.40$$

6.1.5 Coefficient of Variation

The actual dispersion/variation as determined by standard deviation, is called absolute dispersion. Relative dispersion, on the other hand gives feel about absolute dispersion relative to mean/average. In other words, If the absolute dispersion is the standard deviation (s) and average is the mean ($\overline{X}$), then the relative dispersion is called 'coefficient of dispersion' or 'coefficient of variation' (V). It is given by:

$$V = \frac{\sigma}{\overline{X}}$$

It is generally expressed as a percentage.

Example 6: Security A gives a return of 12% with a dispersion of 4%, while security B gives a return of 20% with a dispersion of 5%. Which security is more risky?

Coefficient of Variation for Security A = (4/12) = 0.33 or 33% and

Coefficient of Variation for Security B = (5/20) = 0.25 or 25%. Therefore, the security A is more risky in relation to its return.

6.1.6 Covariance

Covariance describes the nature of relationship between two variables/securities. If X and Y are two securities, then the covariance between the two securities is given by the following formula:

$$cov_{xy} = \frac{[(Xi - \overline{X})(Yi - \overline{Y})]}{N} \qquad \text{where } i = (1, 2, 3,..,n)$$

When two securities are combined, if rates of return of two securities move together,

their interactive risk/covariance is said to be positive and vice versa. If rates of return are independent, then the covariance is zero.

6.1.7 Coefficient of Correlation

Coefficient of correlation is another measure designed to indicate the similarity or dissimilarity in the behaviour of two variables (here two securities x and y). The total variation consists of explained variation as well as unexplained variation. The ratio of the explained variation to the total variation is called the 'co-efficient of determination'. Since the ratio is always non-negative, it is denoted by ρ^2.The quantity ρ_{xy} is called the coefficient of correlation and is given by:

$$\rho_{xy} = \frac{\text{cov}_{xy}}{\sigma_x \sigma_y}$$

where, σ_x = standard deviation of x

σ_y = standard deviation of y

It ranges between –1 and +1 (+1 perfectly correlated, 0 uncorrelated and –1 perfectly negatively correlated).

6.1.8 Normal Distribution

A distribution function is often used to define a behaviour of a population (values in a population). A function can be discrete (Binomial, Poisson etc.) or continuous (Normal, Gaussian etc.). The Normal distribution is a continuous probability distribution function defined in terms of mean and standard deviation. The shape of a normal distribution is a symmetrical and bell-shaped curve. The mean, median and mode are the same under normal distribution. The probability of any value falling within any range can be determined. With $\pm 1\sigma$ from the mean, there will be a 68.5% probability of an outcome occurring, with $\pm 2\sigma$ from the mean there will be a 95% probability, and with $\pm 3\sigma$ deviation from the mean, there will be a 99% probability. The stock price over a period of time tends to follow a pattern which is similar to the normal distribution.

1. Example : A stock is at Rs.1000 on day 1. The total risk 'σ' of the stock is 3% per day. What range of prices would be observed on day 2 with 99% probability?

At 99% probability, the value can lie anywhere between $\pm 3\sigma$ from the mean
That is, the price can vary from 1000 – (3 * 3% * 1000) = 1000 – 90 = Rs.910
to 1000 + (3 * 3% * 1000) = 1000 + 90 = Rs.1090
Hence, the price can vary between Rs.910 to Rs.1090 on the next day.

6.2 RETURN AND RISK

Return and risk are the two key determinants of security prices or values. This calls for an explicit and quantitative understanding of the concepts.

6.2.1 Return and Risk of a Single Asset

Return on an investment/asset for given period, say a year, consists of annual income (dividend) receivable plus change in market price. Symbolically,

Rate of Return (R) = $\frac{Yd_t+(P_t-P_{t-1})}{P_{t-1}}$

Where,

Yd_t = annual income/cash dividend at the end of time period 't'.

P_t = security price at time period 't' which is closing/ending price.

P_{t-1} = security price at time period 't-1' which is opening/beginning price.

For example, for a security if price at the beginning of the year is Rs. 50.00; dividend receivable at the end of the year is Rs. 2.50; and price at the end of the year is Rs. 55.00 then, the rate of return on this security is:

$$\frac{2.50+(55.00-50.00)}{50}=0.15=15\% .$$

The rate of return of 15 per cent has two components:

(i) Current yield i.e annual income ÷ opening/beginning price = 2.50 ÷ 50.00 =.05 = 5% and

(ii) Capital gains/loss yield, i.e. (end price-opening price) ÷ opening/beginning price = (Rs.55 – Rs. 50) ÷ Rs. 50 =0.1 = 10%

Risk may be described as variability/fluctuation/deviation of actual return from expected return from a given asset/investment. Higher the variability, greater is the risk. In other words, the more certain the return from an asset, lesser is the variability and thereby lesser is the risk.

Types of Risks:

The risk of a security can be broadly classified into two types such as systematic risk and unsystematic risk. Standard deviation has been used as a proxy measure for total risk.

Systematic Risk

Systematic Risk refers to that portion of total variability (/risk) in return caused by factors affecting the prices of all securities. Economic, political, and sociological changes are the main sources of systematic risk. Though it affects all the securities in the market, the extend to which it affects a security will vary from one security to another. Systematic risk can not be diversified. Systematic risk can be measured in terms of Beta (β), a statistical measure. The beta for market portfolio is equal to one by definition. Beta of one (β=1), indicates that volatility of return on the security is same as the market or index; beta more than one (β>1) indicates that the security has more unavoidable risk or is more volatile than market as a

whole, and beta less than one (β<1) indicates that the security has less systematic risk or is less volatile than market.

Unsystematic risk

Unsystematic Risk refers to that portion of total risk that is unique or peculiar to a firm or an industry, above and beyond that affecting securities markets in general. Factors like consumer preferences, labour strikes, management capability etc. cause unsystematic risk (/variability of returns) for a company's stock. Unlike systematic risk, the unsystematic risk can be reduced/avoided through diversification. Total risk of a fully diversified portfolio equals to the market risk of the portfolio as its specific risk becomes zero.

Measurement of Risk for a Single Asset:

The statistical measures of a risk of an asset are: (a) Standard Deviation and (b) Co-efficient of variation.

(a) ***Standard Deviation of Return*:** Standard deviation, as discussed earlier, is the most common statistical measure of risk of an asset from the expected value of return. It represents the square root of average squared deviations of individual returns from the expected return. Symbolically,

$$\sigma = \sqrt{\sum_{i=1}^{n} \frac{(R_i - \overline{R})^2}{N}}$$

(b) ***Co-efficient of variation*:** is a measure of risk per unit of expected return. It converts standard deviation of expected values into relative values to enable comparison of risks associated with assets having different expected values. The coefficient of variation (CV) is computed by dividing the standard deviation of return, s_R, for an asset by its expected value, $\overline{R}$. Symbolically,

$$CV = \frac{\sigma_R}{\overline{R}}$$

The larger the CV, the larger the relative risk of the asset.

6.2.2 Return and Risk of a portfolio

Investors prefer investing in a portfolio of assets (combination of two or more securities/ assets) rather than investing in a single asset. The expected returns on a portfolio is a weighted average of the expected returns of individual securities or assets comprising the portfolio. The weights are equal to the proportion to amount invested in each security to the total amount.

For example, when a portfolio consists of two securities, its expected return is:

$$\overline{R}_P = w_1 \overline{R}_1 + (1 - w_1)\overline{R}_2$$

where,

$\overline{R}_P$ = Expected return on a portfolio

w_1 = proportion of portfolio invested in security 1

$(1-w_1)$ = proportion of portfolio invested in security 2.

In general, expected return on a portfolio consisting of 'n' securities is expressed as:

$$\overline{R}_P = \sum_{i=1}^{n} w_i \overline{R}_i$$

Illustration: What is the portfolio return, if expected returns for the three assets such as A, B, and C, are 20%, 15% and 10% respectively, assuming that the amount of investment made in these assets are Rs. 10,000, Rs. 20,000, and Rs. 30,000 respectively.

Weights for each of the assets A, B, and C respectively may be calculated as follows:

Total Amount invested in the portfolio of 3 assets (A, B, and C) = Rs. 10,000 + Rs. 20,000 + Rs.30,000 = Rs. 60,000.

Weight for the asset A = 10000/60000 = 1/6 = 0.1667
Weight for the asset B = 20000/60000 = 1/3 = 0.3333
Weight for the asset C = 30000/60000 = 1/2 = 0.5

Given expected returns for the three assets A, B, and C, as 20%, 15% and 10% respectively,
Returns on Portfolio
= (0.1667*0.20)+(0.3333*0.15)+(0.5*0.10)
= 0.13334*100 =13.33%

Measurement of Risk for a portfolio

According to the Modern Portfolio Theory, *while the expected return of a portfolio is a weighted average of the expected returns of individual securities (or assets) included in the portfolio, the risk of a portfolio measured by variance(or standard deviation) is* ***not*** *equal to* the *weighted average of the risk of individual securities included in the portfolio.* The risk of a portfolio not only depends on variance/risk of individual securities but also on co-variances between the returns on the individual securities.

Given the covariance between the returns on the individual securities, the portfolio variance consisting of 'n' securities is calculated as:

$$\text{Var } (R_p) = \sigma_P^2 = \sum_{a=1}^{n} \sum_{b=1}^{n} w_a w_b Cov(R_a, R_b) \qquad (7.1)$$

Since the covariance between two variables is the product of their standard deviations multiplied by their co-efficient of correlation, covariance between the returns on two securities, $[Cov(R_a, R_b)]$ may be expressed as:

$$Cov(R_a, R_b) = \rho_{ab}\sigma_a\sigma_b$$

where,

ρ_{ab} = coefficient of correlation between Ra and R_b

σ_a = standard deviation of Ra

σ_b = standard deviation of R_b

Hence, in case co-variances are not known and correlation co-efficients are given, the Portfolio variance (σ_p^2) can be calculated with following formula:

$$\sigma_p^2 = \sum_{a=1}^{n} \sum_{b=1}^{n} w_a w_b \rho_{ab} \sigma_a \sigma_b$$

(7.1a)

Portfolio with Two Securities:

Assuming a portfolio consisting of two securities (i.e. n=2), Portfolio Variance for the two securities is calculated by substituting n=2 in the formula (7.1) as follows:

Var (R_p)=

$$\sigma_P^2 = w_1 w_1 \rho_{1.1} \sigma_1 \sigma_1 + w_1 w_2 \rho_{1.2} \sigma_1 \sigma_2 + w_2 w_1 \rho_{2.1} \sigma_2 \sigma_1 + w_2 w_2 \rho_{2.2} \sigma_2 \sigma_2 \qquad (7.2)$$

The first and the last terms can be simplified. Clearly the return on a security is perfectly (positively) correlated with itself. Thus, $\rho_{1.1} = 1$, as does $\rho_{2.2} = 1$. Because $\rho_{2.1} = \rho_{1.2}$, the second terms can be combined. The result is:

Portfolio Variance, $Var(R_P) = \sigma_P^2 = w^2_1\sigma^2_1 + w^2_2\sigma^2_2 + 2\, w_1\, w_2\, \rho_{1.2}\, \sigma_1\sigma_2$

OR substituting $\rho_{1.2}\, \sigma_1\sigma_2$ by Cov (1, 2), we get,

$Var(R_P) = \sigma_P^2 = w^2_1\sigma^2_1 + w^2_2\sigma^2_2 + 2\, w_1\, w_2 \text{Cov}\ (1, 2)$

Portfolio Risk (standard deviation) $\sigma_P = \sqrt{PorfolioVariance}$

Illustration: The standard deviation of the *two securities* (a, b) are 20% and 10% respectively. The two securities in the portfolio are assigned equal weights. If their correlation coefficient is +1, 0 or –1 what is the portfolio risk?

(i) When the correlation is +1

Portfolio Variance = $0.5^2 * 0.2^2 + 0.5^2 * 0.10^2 + 2 * 0.5 * 0.5 *$ Cov (a, b)

= $0.25 * 0.04 + 0.25 * 0.01 + 2 * 0.25 * 1 * 0.2 * 0.1$

= $0.0100 + 0.0025 + 2 * 0.25 * 1 * 0.02$

= $0.0100 + 0.0025 + 0.0100$

= 0.0225

Portfolio Risk (Standard Deviation) = $\sqrt{PorfolioVariance}$ = 0.15

(ii) When the correlation is 0

Portfolio Variance $= 0.5^2*0.2^2 + 0.5^2*0.10^2 + 2*0.5*0.5*$ Cov (a, b)

$= 0.0100 + 0.0025 + 0$

$= 0.0125$

Portfolio Risk (Standard Deviation) = $\sqrt{PorfolioVariance} = 0.1118$

(iii) When the correlation is -1

Portfolio Variance $= 0.5^2*0.2^2 + 0.5^2*0.10^2 + 2*0.5*0.5*$ Cov (a, b)

$= 0.0100 + 0.0025 + (-0.0100)$

$= 0.0025$

Portfolio Risk (Standard Deviation) = $\sqrt{PorfolioVariance} = 0.05$

Portfolio with Three Securities:
Illustration:

Consider the following three securities and the relevant data on each:

	Security1	Security2	Security3
Expected return	10	12	8
Standard deviation	10	15	5
Correction coefficients:			
Stocks 1, 2 = .3			
2, 3 = .4			
1, 3 = .5			

The proportion (weights) assigned to each of the securities as security 1= 0.2; security 2=0.4; and security 3=0.4. What is portfolio risk?

Using the formula for portfolio risk (equation 7.1)and expanding it for N = 3, we get:

$$\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + W_3^2\sigma_3^2 + 2W_1W_2\rho_{1.2}\sigma_1\sigma_2 + 2W_3W_2\rho_{2.3}\sigma_3\sigma_2 + 2W_3W_1\rho_{1.3}\sigma_3\sigma_1$$

Capital Asset Pricing Model (CAPM)

Portfolio Theory developed by Harry Markowitz is essentially a normative approach as it prescribes what a rational investor should do. On the other hand, Capital Asset Pricing Model (CAPM) developed by William Sharpe and others is an exercise in positive economics as it is concerned with (i) what is the relationship between risk and return for efficient portfolio? and (ii) What is the relationship between risk and return for an individual security? CAPM assumes that individuals are risk averse.

CAPM describes the relationship/trade-off between risk and expected/required return. It explains the behaviour of security prices and provides mechanism to assess the impact of an investment in a proposed security on risks and return of investors' overall portfolio. The CAPM

provides framework for understanding the basic risk-return trade-offs involved in various types of investment decisions. It enables drawing certain implications about risk and the size of risk premiums necessary to compensate for bearing risks.

Using beta (β) as the measure of nondiversifiable risk, the CAPM is used to define the required return on a security according to the following equation:

$$R_s = R_f + \beta_s (R_m - R_f)$$

Where:

R_s = the return required on the investment

R_f = the return that can be earned on a risk-free investment (e.g. Treasury bill)

R_m = the average return on all securities (e.g., S&P 500 Stock Index)

β_s = the security's beta (systematic) risk

It is easy to see the required return for a given security increases with increases in its beta.

Application of the CAPM can be demonstrated. Assume a security with a beta of 1.2 is being considered at a time when the risk-free rate is 4 percent and the market return is expected to be 12 percent. Substituting these data into the CAPM equation, we get

$$\begin{aligned} R_s &= 4\% + [1.20 * (12\% - 4\%)] \\ &= 4\% + [1.20 * 8\%] \\ &= 4\% + 9.6\% = 13.6\% \end{aligned}$$

The investor should therefore require a 13.6 percent return on this investment a compensation for the non-diversifiable risk assumed, given the security's beta of 1.2. If the beta were lower, say 1.00, the required return would be 12 percent [4%+ [1.00*(12%-4%)]: and if the beta had been higher, say 1.50, the required return would be 16 percent [4%+ [1.50* (12%-4%)]. Thus, CAPM reflects a positive mathematical relationship between risk and return, since the higher the risk (beta) the higher the required return.