NISM CERTIFICATION EXAMINATION WORK BOOK

VIII

Equity Derivatives



National Institute of Securities Markets
A Capacity Building Initiative of SEBI

Workbook for
NISM-Series-VIII:
Equity Derivatives
Certification Examination

National Institute of Securities Markets
A Capacity Building Initiative of SEBI

National Institute of Securities Markets

www.nism.ac.in

This workbook has been developed to assist candidates in preparing for the National Institute of Securities Markets (NISM) NISM-Series-VIII: Equity Derivatives Certification Examination (NISM-Series-VIII: ED Examination).

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Foreword

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The NISM certification programs aim at enhancing the quality and standards of professionals employed in various segments of the financial sector. NISM develops and conducts certification examinations and Continuing Professional Education (CPE) programs that aim at ensuring that professionals meet the defined minimum common knowledge benchmark for various critical securities market functions.

NISM certification examinations and educational programs service different securities market intermediaries focusing on varied product lines and functional areas. NISM certifications have established knowledge benchmarks for various market products and functions such as equities, mutual funds, derivatives, compliance, operations, advisory and research. NISM certification examinations and training programs provide a structured learning plan and career path to students and job aspirants, wishing to make a professional career in the securities markets.

NISM supports candidates by providing lucid and focused workbooks that assist them in understanding the subject and preparing for NISM Examinations. The book covers basics of the equity derivatives, trading strategies using equity futures and equity options, clearing, settlement and risk management as well as the regulatory environment in which the equity derivatives markets operate in India. It will be immensely useful to all those who want to have a better understanding of various derivatives products available in Indian equity derivatives markets.

Mr. Sashi Krishnan
Director

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While the NISM Certification examination will be largely based on material in this workbook, NISM does not guarantee that all questions in the examination will be from material covered herein.

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NISM gratefully acknowledges the contribution of the Examination Committee for NISM-Series-VIII: Equity Derivatives Certification Examination consisting of representatives of Stock Exchanges and Industry Experts.

About NISM Certifications

NISM is engaged in developing and administering Certification Examinations and Continuing Professional Education (CPE) Programmes for professionals employed in various segments of the Indian securities markets. These Certifications and CPE Programmes are being developed and administered by NISM as mandated under Securities and Exchange Board of India (Certification of Associated Persons in the Securities Markets) Regulations, 2007.

The skills, expertise and ethics of professionals in the securities markets are crucial in providing effective intermediation to investors and in increasing the investor confidence in market systems and processes. NISM seeks to ensure that market intermediaries meet defined minimum common benchmark of required functional knowledge through Certification Examinations and CPE Programmes on Mutual Funds, Equities, Derivatives, Securities Operations, Compliance, Portfolio Management etc.

These Certifications create quality market professionals and catalyzes greater investor participation in the markets. They also provide structured career paths to students and job aspirants in the securities markets.

About the NISM-Series-VIII: Equity Derivatives Certification Examination

The examination seeks to create a common minimum knowledge benchmark for associated persons functioning as approved users and sales personnel of the trading member of an equity derivatives exchange or equity derivative segment of a recognized stock exchange.

The examination aims to enable a better understanding of various derivatives products available in equity derivatives markets, regulations and risks associated with the products and the exchange mechanisms of clearing and settlement. The examination also covers knowledge competencies related to the understanding of the financial structure in India and the importance of the different rules and regulations governing the Indian securities market, especially those related to the equity derivatives segment.

Examination Objectives

On successful completion of the examination the candidate should:

- Know the basics of the Indian equity derivatives market.
- Understand the various trading strategies that can be built using futures and options on both stocks and stock indices.
- Understand the clearing, settlement and risk management as well as the operational mechanism related to equity derivatives markets.
- Know the regulatory environment in which the equity derivatives markets operate in India.

Assessment Structure

The NISM-Series-VIII: Equity Derivatives Certification Examination (NISM-Series-I: ED Examination) will be of 100 marks consisting of 100 questions of 1 mark each, and should be completed in 2 hours. There will be negative marking of 25% of the marks assigned to each question. The passing score for the examination is 60%.

How to register and take the examination

To find out more and register for the examination, please visit www.nism.ac.in

Feedback and Queries

For any feedback and/or queries, please write back at certification@nism.ac.in.

Important

- Please note that the Test Centre workstations are equipped with either Microsoft Excel or OpenOffice Calc. Therefore, candidates are advised to be well versed with both of these softwares for computation of numericals.
- The sample case lets and multiple-choice questions illustrated in the book are for reference purposes only. The level of difficulty may vary in the actual examination.

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CHAPTER 1: BASICS OF DERIVATIVES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Meaning of derivatives and types of derivatives products
- History of derivatives market
- Significance of derivative markets
- Risks in derivatives trading

1.1 Basics of Derivatives

A derivative is a contract or a product whose value is derived from the value of some other asset known as the underlying. Derivatives are based on a wide range of underlying assets. These include:

- Metals such as Gold, Silver, Aluminium, Copper, Zinc, Nickel, Tin, Lead, etc.
- Energy resources such as Oil (crude oil, products, cracks), Coal, Electricity, Natural Gas, etc.
- Agri commodities such as Wheat, Sugar, Coffee, Cotton, Pulses etc., and
- Financial assets such as Shares, Bonds and Foreign Exchange.

1.2 Derivatives Market – History & Evolution

The history of derivatives may be mapped back to several centuries. Some of the specific milestones in evolution of the derivatives market worldwide are given below:

12th Century - In European trade fairs, sellers signed contracts promising future delivery of the items they sold.

13th Century - There are many examples of contracts entered into by English Cistercian Monasteries, who frequently sold their wool up to 20 years in advance, to foreign merchants.

1634-1637 - Tulip Mania in Holland: Fortunes were lost after a speculative boom in tulip futures burst.

Late 17th Century - In Japan at Dojima, near Osaka, a futures market in rice was developed to protect rice producers from bad weather or warfare.

In 1848, The Chicago Board of Trade (CBOT) facilitated trading of forward contracts on various commodities.

In 1865, the CBOT went a step further and listed the first “exchange traded” derivative contract in the US. These contracts were called “futures contracts”.

In 1919, Chicago Butter and Egg Board, a spin-off of CBOT, was reorganised to allow futures trading. Later its name was changed to Chicago Mercantile Exchange (CME).

In 1972, Chicago Mercantile Exchange introduced International Monetary Market (IMM), which allowed trading in currency futures.

In 1973, Chicago Board Options Exchange (CBOE) became the first marketplace for trading listed options.

In 1975, CBOT introduced Treasury bill futures contract. It was the first successful pure interest rate futures.

In 1977, CBOT introduced T-bond futures contract.

In 1982, CME introduced Eurodollar futures contract.

In 1982, Kansas City Board of Trade launched the first stock index futures.

In 1983, Chicago Board Options Exchange (CBOE) introduced option on stock indices with the S&P 100® (OEX) and S&P 500® (SPXSM) Indices.

Factors influencing the growth of derivative market globally

Over the last five decades, the derivatives market has seen a phenomenal growth. Many derivative contracts were launched at exchanges across the world. Some of the factors driving the growth of financial derivatives are:

- Increased fluctuations in underlying asset prices in financial markets.
- Integration of financial markets globally.
- Use of latest technology in communications has helped in reduction of transaction costs.
- Enhanced understanding of market participants on sophisticated risk management tools to manage risk.
- Frequent innovations in derivatives market and newer applications of products.

1.3 Indian Derivatives Market

As the initial step towards introduction of derivatives trading in India, 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 recommending that derivatives should be declared as 'securities' so that regulatory framework applicable to trading of 'securities' could also govern trading of derivatives. Subsequently, SEBI 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 committee submitted its report in October 1998. It worked out the operational details of margining system, methodology

for charging initial margins, membership details and net-worth criterion, deposit requirements and real time monitoring of positions requirements.

In 1999, The Securities Contract Regulation Act (SCRA) was amended to include "derivatives" within the domain of 'securities' and a regulatory framework was developed for governing derivatives trading. In March 2000, the government repealed a three-decade-old notification, which prohibited forward trading in securities.

The exchange traded derivatives started in India in June 2000 with SEBI permitting BSE and NSE to introduce the equity derivatives segment. To begin with, SEBI approved trading in index futures contracts based on Nifty and Sensex, which commenced trading in June 2000. Later, trading in Index options commenced in June 2001 and trading in options on individual stocks commenced in July 2001. Futures contracts on individual stocks started in November 2001. Metropolitan Stock Exchange of India Limited (MSEI) started trading in derivative products in February 2013.

Products in the Derivatives Market

Forwards

It is a contractual agreement between two parties to buy/sell an underlying asset at a certain future date for a particular price that is pre-decided on the date of contract. Both the contracting parties are committed and are obliged to honour the transaction irrespective of the price of the underlying asset at the time of delivery. Since forwards are negotiated between two parties, the terms and conditions of contracts are customized. These are Over-the-counter (OTC) contracts.

Futures

A futures contract is similar to a forward, except that the deal is made through an organized and regulated exchange rather than being negotiated directly between two parties. Futures are also standardized contracts (in terms of their lot size, maturity date, etc.) so that they can be traded on the exchange. Indeed, we may say futures are exchange traded forward contracts.

Options

An Option is a contract that gives the right, but not an obligation, to buy or sell the underlying on or before a stated date and at a stated price. While the buyer of an option pays the premium and buys the right, the writer/seller of an option receives the premium with the obligation to sell/ buy the underlying asset, if the buyer exercises his right.

Swaps

A swap is an agreement made between two parties to exchange cash flows in the future according to a prearranged formula. Swaps are, broadly speaking, a series of forward

contracts. Swaps help market participants manage risks associated with volatile interest rates, currency exchange rates and commodity prices.

1.4 Market Participants

There are broadly three types of participants in the derivatives market - hedgers, traders (also called speculators) and arbitrageurs. An individual may play different roles in different market circumstances.

Hedgers

They face risk associated with the prices of underlying assets and use derivatives to reduce their risk. Corporations, investing institutions and banks all use derivative products to hedge or reduce their exposures to market variables such as interest rates, share prices, bond prices, currency exchange rates and commodity prices.

Speculators/Traders

They try to predict the future movements in prices of underlying assets and based on the view, take positions in derivative contracts. Derivatives are preferred over underlying asset for trading purpose, as they offer leverage, are less expensive (cost of transaction is generally lower than that of the underlying) and are faster to execute in size (high volumes market).

Arbitrageurs

Arbitrage is a deal that produces profit by exploiting a price difference in a product in two different markets. Arbitrage originates when a trader purchases an asset cheaply in one location and simultaneously arranges to sell it at a higher price in another location. Such opportunities are unlikely to persist for very long, since arbitrageurs would rush into these transactions, thus closing the price gap at different locations.

1.5 Types of Derivatives Market

In the modern world, a huge variety of derivatives products are available. They are either traded on organised exchanges (called exchange traded derivatives) or agreed directly between the contracting counterparties over the telephone or through electronic media (called Over-the-counter (OTC) derivatives). A few complex products are constructed on simple building blocks like forwards, futures, options and swaps to cater to the specific requirements of customers.

The over-the-counter market is not a physical marketplace but a collection of broker-dealers scattered across the country. The main idea of the market is more a way of doing business than a place. Buying and selling of contracts are matched through negotiated bidding process over a network of telephone or electronic media that link thousands of intermediaries. OTC derivative markets have witnessed a substantial growth over the past

few years, very much contributed by the recent developments in information technology. The OTC derivative markets have banks, financial institutions and sophisticated market participants like hedge funds, corporations and high net-worth individuals. OTC derivative market is a less regulated market because these transactions occur in private among qualified counterparties, who are supposed to be capable enough to take care of themselves.

In the OTC derivatives markets, transactions among the dealing counterparties, have the following features compared to exchange traded derivatives:

- Contracts are tailor made to fit in the specific requirements of dealing counterparties.
- The management of counter-party (credit) risk is decentralized and located within individual institutions.
- There are no formal centralized limits on individual positions, leverage, or margining.
- There are no formal rules or mechanisms for risk management to ensure market stability and integrity, and for safeguarding the collective interest of market participants.
- Transactions are private with little or no disclosure to the entire market.

On the contrary, exchange-traded contracts are standardized, traded on organized exchanges with prices determined by the interaction of buyers and sellers through anonymous auction platform. A clearing corporation guarantees contract performance (settlement of transactions).

1.6 Significance of Derivatives

Like other segments of Financial Market, the derivatives market serves the following specific functions:

- It helps in improving price discovery based on actual valuations and expectations.
- It enables the transfer of various risks from those who are exposed to risk but have a low risk appetite to participants with a high-risk appetite. For example, hedgers want to give away the risk whereas traders are willing to take risk.
- It enables the shift of speculative trades from the unorganized market to the organized market. Risk management mechanism and surveillance of activities of various participants in the organized space provide stability to the financial system.

1.7 Various risks faced by the participants in derivatives

Market participants must understand that derivatives, being leveraged instruments, have risks like counterparty risk (default by counterparty), price risk (loss on position because

of price move), liquidity risk (inability to exit from a position), legal or regulatory risk (enforceability of contracts), operational risk (fraud, inadequate documentation, improper execution, etc.) and may not be an appropriate avenue for someone of limited resources, or having limited trading experience, or with low risk tolerance. A market participant should therefore carefully consider whether such trading is suitable for him/her based on these parameters. Market participants, who trade in derivatives are advised to carefully read the Model Risk Disclosure Document, given by the broker to his clients at the time of signing agreement.

A Model Risk Disclosure Document is issued by the members of Exchanges and contains important information on trading in Equities and F&O Segments of exchanges. All prospective participants should read this document before trading on Capital Market/Cash Segment or F&O segment of the Exchanges.

Sample Questions

1. An index option is a _____.
(a) Debt instrument
(b) **Derivative product**
(c) Cash market product
(d) Money market instrument

2. The purchase of a share in one market and the simultaneous sale in a different market to benefit from price differentials is known as _____.
(a) Mortgage
(b) **Arbitrage**
(c) Hedging
(d) Speculation

3. Financial derivatives provide the facility for _____.
(a) Trading
(b) Hedging
(c) Arbitraging
(d) **All of the above**

4. Operational risks include losses due to _____.
(a) **Inadequate disaster planning**
(b) Too much of management control
(c) Income tax regulations
(d) Government policies

CHAPTER 2: UNDERSTANDING THE INDEX

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- The Index and its significance
- Different types of stock market indices
- Index management and maintenance
- Applications of indices

2.1 Introduction to an Index

An index is a statistical indicator that measures changes in the economy in general or specific areas. In case of financial markets, an index is a portfolio of securities that represent a particular market or a portion of a market. Each index has its own calculation methodology and usually is expressed in terms of a change from a base value. The base value might be as recent as the previous day or many years in the past. Thus, the percentage change is more important than the actual numeric value. Financial indices are created to measure price movement of stocks, bonds, T-bills and other type of financial securities. More specifically, a stock index is created to provide market participants with the information regarding the average share price movement in the market. Broad indices are expected to capture the overall behaviour of equity market and need to represent the return obtained by typical portfolios in the country.

2.2 Significance of the stock index

- A stock index is an indicator of the performance of the overall market or a particular sector.
- It serves as a benchmark for portfolio performance - Managed portfolios, belonging either to individuals or mutual funds, use the stock index as a measure for evaluation of their performance.
- It is used as an underlying for financial application of derivatives – Various products in OTC and exchange traded markets are based on indices as the underlying asset.

2.3 Types of Stock Market Indices

Indices can be designed and constructed in various ways. Depending upon their methodology, they can be classified as under:

Market capitalization weighted index

In this method of calculation, each stock is given a weight according to its market capitalization. So higher the market capitalization of a constituent, higher is its weight in the index. Market capitalization is the market value of a company, calculated by multiplying the total number of shares outstanding to its current market price. For

example, ABC company with 5,00,00,000 shares outstanding and a share price of Rs 120 per share will have market capitalization of 5,00,00,000 x 120 = Rs 6,00,00,00,000 i.e., 600 Crores.

Let us understand the concept with the help of an example: There are five stocks in an index. Base value of the index is set to 100 on the start date which is January 1, 1995. Calculate the current value of index based on following information:

Sr. No.	Stock Name	Stock price as on January 1, 1995 (in Rs.)	Number of shares in lakhs	Today's stock price (in Rs.)
1	AZ	150	20	650
2	BY	300	12	450
3	CX	450	16	600
4	DW	100	30	350
5	EU	250	8	500

The market capitalization of the index on January 1, 1995 is Rs. 18,800 which is the sum of the market price multiplied by the quantity of shares for each stock in the index. With the change in market prices, the market capitalization of these stocks increases from Rs.18,800 lakhs to Rs.42,500 lakhs. The market capitalization on January 1, 1995 is equated to 100. Hence, the new value of the index is calculated as (42500 lakhs / 18800 lakhs) * 100, which works out to 226.06. Since the index has risen from a base of 100 to a new value of 226.06, the change in the index value is 126.06 per cent.

Stock Name	Old Price (Rs)	No. of Shares (in lakhs)	Old M.Cap. (in Rs lakhs)	Old Weights	New Price (Rs)	New M.Cap. (in Rs lakhs)	New Weights
AZ	150	20	3000	0.16	650	13000	0.31
BY	300	12	3600	0.19	450	5400	0.13
CX	450	16	7200	0.38	600	9600	0.23
DW	100	30	3000	0.16	350	10500	0.25
EU	250	8	2000	0.11	500	4000	0.09
			18800	1.00		42500	1.00

Popular indices in India, Sensex and Nifty, were earlier designed on market capitalization weighted method.

Free-Float Market Capitalization Index

In various businesses, equity holding is divided differently among various stakeholders – promoters, institutions, corporates, individuals, etc. The market has started to segregate

this on the basis of what is readily available for trading and what is not. The one available for immediate trading is categorized as free float. And, if we compute the index based on weights of each security based on free float market cap, it is called free float market capitalization index. A majority of the stock indices globally, over a period of time, have moved to free float basis, including the Indian equity indices - Sensex, Nifty and SX40.

Price-Weighted Index

This is a stock index in which each stock influences the index in proportion to its price. Stocks with a higher price will be given more weight and therefore, will have a greater influence over the performance of the Index.

Let us take the same data as above for calculation of price-weighted index:

Sr. No.	Stock Name	Stock price as on January 1, 1995 (in Rs.)	Number of shares in lakhs	Today's stock price (in Rs.)
1	AZ	150	20	650
2	BY	300	12	450
3	CX	450	16	600
4	DW	100	30	350
5	EU	250	8	500

The formula for calculating the value of a price-weighted index is as follows:
Price index = (Sum of the prices of all stocks included in Index) / (No. of stocks in Index)

Hence, the price index on January 1, 1995 = (150+300+450+100+250)/5 = 250.

The current value of the index is the sum of the current prices of all stocks included in the index divided by the number of stocks. The current value of the index = (650+450+600+350+500) / 5 = 510. Thus, the increase in the value of the index is (510 - 250) / 250, i.e. 104%. This can be verified as follows:

Stock Name	Price on Jan 1, 1995	Weights	Current price	Percent Change in price	Percent change in price * weight
AZ	150	0.12	650	333.33%	40.00%
BY	300	0.24	450	50.00%	12.00%
CX	450	0.36	600	33.33%	12.00%
DW	100	0.08	350	250.00%	20.00%
EU	250	0.20	500	100.00%	20.00%
	1250	1.00	2550		104.00%

Dow Jones Industrial Average and Nikkei 225 are popular price-weighted indices.

Equal Weighted Index

An equal-weighted index is one in which all stocks included in the index have the same weightage. The number of shares of each stock is adjusted in such a way that the weight of each stock in the index is the same. Subsequently, if there is any change in the market price of each stock, the weight of each stock will change. To maintain the same equal weights as earlier, the fund manager needs to sell those stocks that have increased in price and buy the stocks that have fallen in price.

The following is an example of the computation of an equal weighted index:

Stock name	Price on Jan 1, 1995	Quantity as on Jan 1, 1995	Value as on Jan 1, 1995	Weight on Jan 1, 1995	Current price	Current value (= Qty * Price)	Price change	Price change * Old weight
P	100	300	30000	0.25	150	45000	50.00%	12.50%
Q	150	200	30000	0.25	130	26000	-13.33%	-3.33%
R	125	240	30000	0.25	200	48000	60.00%	15.00%
S	200	150	30000	0.25	180	27000	-10.00%	-2.50%
			120000	1.00		146000		21.67%

Consider an index constructed on January 1, 1995 with 4 stocks. The number of shares of each stock is adjusted in such a manner that the value of all stocks in the index is equal. Thus, each stock has the same weight in the index. With a change in the stock prices, the current value of the stocks in the index has changed from 120,000 to 146,000. If the old index value is equated to 100, the new index value will be 146000/120000*100, i.e. 121.67. As can be seen from the last column in the above table, this is simply the percentage change in the stock price multiplied by the original weight of each stock, which equals to a rise of 21.67%.

With the changed prices, stock P and stock R have a weight greater than 25% while stock Q and stock S have a weight lower than 25%. The fund manager will then have to rebalance the index to restore equal weights. This can be done by selling appropriate quantities of stocks P and R and buying required quantities of stocks Q and S.

2.4 Attributes of an Index

A good market index should have following attributes:

- It should reflect the market behaviour.
- It should be computed by independent third party and be free from influence of any market participant.
- It should be professionally maintained.

Impact Cost

Liquidity in the context of stock market means a market where large orders are executed without moving the prices.

Let us understand this with help of an example. The order book of a stock at a point in time is as follows:

Buy			Sell		
Sr. No.	Quantity	Price (in Rs.)	Price (in Rs.)	Quantity	Sr. No.
1	1000	4.00	4.50	2000	5
2	1000	3.90	4.55	1000	6
3	2000	3.80	4.70	500	7
4	1000	3.70	4.75	100	8

In the order book given above, there are four buy orders and four sell orders. The difference between the best buy and the best sell orders is 0.50 - called bid-ask spread. If a person places a market buy order for 100 shares, it would be matched against the best available sell order at Rs. 4.50. He would buy 100 shares for Rs. 4.50. Similarly, if he places a market sell order for 100 shares, it would be matched against the best available buy order at Rs. 4 i.e. the shares would be sold at Rs. 4. Hence, if a person buys 100 shares and sells them immediately, he is poorer by the bid-ask spread i.e., a loss of Rs 50. This spread is regarded as the transaction cost which the market charges for the privilege of trading (for a transaction size of 100 shares).

Now, suppose a person wants to buy and then sell 3000 shares. The sell order will hit the following buy orders:

Sr. No.	Quantity	Price (in Rs.)
1	1000	4.00
2	1000	3.90
3	1000	3.80

While the buy order will hit the following sell orders:

Quantity	Price (in Rs.)	Sr. No.
2000	4.50	5
1000	4.55	6

There is increase in the transaction cost for an order size of 3000 shares in comparison to the transaction cost for order for 100 shares. The “bid-ask spread” therefore conveys the transaction cost for a small trade.

Now, we come across a term called impact cost. We must start by defining the ideal price as the average of the best bid and offer price. In our example it is (4+4.50)/2, i.e., Rs. 4.25.

In an infinitely liquid market, it would be possible to execute large transactions on both buy and sell at prices that are very close to the ideal price of Rs.4.25. However, while trading, you will pay more than Rs.4.25 per share while buying and will receive less than Rs.4.25 per share while selling. The percentage degradation, which is experienced vis-à-vis the ideal price, when shares are bought or sold, is called impact cost. Impact cost varies with transaction size. Also, it would be different for buy side and sell side.

Buy Quantity	Buy Price (in Rs.)	Sell Price (in Rs.)	Sell Quantity
1000	9.80	9.90	1000
2000	9.70	10.00	1500
3000	9.60	10.10	1000

To buy 1500 shares, Ideal price = (9.8+9.9)/ 2 = Rs.9.85
Actual buy price = [(1000*9.9)+(500*10.00)]/1500 = Rs.9.9333
Impact cost for (1500 shares) = {(9.9333 - 9.85)/9.85}*100 = 0.84 %

2.5 Index management

Index construction, maintenance and revision process is generally done by specialized agencies. For instance, BSE indices are managed by Asia Index Pvt Ltd and NSE indices are managed by NSE Indices Limited.

Index construction is all about choosing the index stocks and deciding on the index calculation methodology. Maintenance means adjusting the index for corporate actions like bonus issue, rights issue, stock split, consolidation, mergers etc. Revision of an index deals with change in the composition of index as such i.e., replacing some existing stocks by the new ones because of a change in the trading paradigm of the stocks, or a shift in the interest of market participants.

Index Construction

A good index is a trade-off between diversification and liquidity. A well-diversified index reflects the behaviour of the overall market/economy. While diversification helps in reducing risk, it may not help beyond a point. Going from 10 stocks to 20 stocks leads to a sharp reduction in risk. Going from 50 stocks to 100 stocks enables very little reduction in risk. Going beyond 100 stocks causes almost zero decline in risk. Hence, there is little to gain by diversifying beyond a point.

Stocks in the index are chosen based on certain pre-determined qualitative and quantitative parameters, laid down by the Index Construction Managers. Once a stock satisfies the eligibility criteria, it is entitled for inclusion in the index. Generally, the final

decision of inclusion or removal of a security from the index is taken by a specialized committee known as the Index Committee.

Implementation of eligibility criteria for derivatives on existing Non-Benchmark Indices

As per SEBI Circular[2] dated October 30, 2025, Stock Exchanges shall follow the following prudential norms for derivatives on existing non-benchmark indices:

a) Minimum of 14 constituents
b) Top constituent weight ≤ 20%
c) Combined weight of the top 3 constituents ≤ 45%
d) Descending weight structure

Implementation Timeline & Method:

Non- Benchmark Indices	Timeline	Mode of Implementation
BANKEX (BSE) and FINNIFTY (NSE)	up to Dec 31, 2025	Single tranche
BANKNIFTY (NSE)	up to Mar 31, 2026	Four monthly tranches

Illustration: Four- Tranche Weight Adjustment:

Tranche	Start Weight	Calculation	Adjusted Weight
Month 1	28%	(Actual weight - desired weight)/4 (28 - 20)/4 = 2%	26%
Month 2	25.5%	(Actual weight - desired weight)/3 (25.5 - 20)/3 = 1.83%	23.67%
Month 3	23%	(Actual weight - desired weight)/2 (23 - 19.5*)/2 = 1.75%	21.25%
Month 4	20.9%	(Actual weight - desired weight)/1 (20.9 - 18.5*)/1 = 2.4%	18.5%

**It is assumed that based on relative price movement of the constituents and hence their free float market cap, the target weight of the instant constituent changed.*

As illustrated above, assume the present weight of a constituent at Rank 1 by weight is 28% and the target weight is 20% (i.e. weight adjustment is 8%). In the first tranche, the weight would be adjusted by 2% (i.e. 8% divided in 4 tranches) to 26%. At the beginning of the next tranche, weights of all the constituents would be re-evaluated for confirmation with prudential norms. Let's assume that the weight of Rank 1 constituent by weight drifted to 25.5% because of inter tranche price movement of constituents.

[2] https://www.sebi.gov.in/legal/circulars/oct-2025/implementation-of-eligibility-criteria-for-derivatives-on-existing-non-benchmark-indices_97564.html

Now, the remaining weight i.e. 25.5 – 20 = 5.5% would be adjusted by 1.83% in the instant tranche (i.e. 5.5/3) and so on.

Index Maintenance and Index Revision

Maintenance and revision of the indices is done with the help of various mathematical formulae. In order to keep the index comparable across time, the index needs to take into account corporate actions such as stock splits, share issuance, dividends and restructuring events. While index maintenance issue gets triggered by a corporate action, index revision is a continuous exercise to ensure that the index captures the most vibrant lot of securities in the market and continues to correctly reflect the market.

2.6 Major Indices in India

These are some of the popular equity indices in India:

• S&P BSE Sensex • S&P BSE Sensex Next 50 • S&P BSE 100 • S&P BSE 200 • S&P BSE 500	• Nifty 50 • Nifty Next 50 • Nifty 100 • Nifty 200 • Nifty 500	• SX 40

2.7 Application of Indices

Traditionally, indices were used as a measure to understand the overall direction of the stock market. However, a few applications have emerged in the investment field which are explained below:

Index Funds

These types of funds invest in a specific index with an objective to generate returns equivalent to the return on index. These funds invest in index stocks in the proportions in which these stocks exist in the index. For instance, Sensex index fund would get similar returns as that of Sensex index (except for a small "tracking error" which occurs due to fund management related expenses and cash holdings maintained to take care of redemptions). Since the Sensex has 30 shares, the fund will also invest in these 30 companies in the proportion in which they exist in the Sensex. Similarly, a Nifty index fund would invest in the 50 component companies of Nifty index in the same proportion in which they exist in the Nifty index and therefore generates similar returns as that of Nifty index (adjusted for tracking error).

Index Derivatives

Index Derivatives are derivative contracts which have the index as the underlying asset. Index Options and Index Futures are the most popular derivative contracts worldwide. Index derivatives are useful as a tool to hedge against the market risk.

Exchange Traded Funds

Exchange Traded Funds (ETFs) is basket of securities that trade like individual stocks, on an exchange. They have a number of advantages over other mutual funds as they can be bought and sold on the exchange. Since, ETFs are traded on exchanges, intraday transaction is possible. Further, ETFs can be used as basket trading in terms of the smaller denomination and low transaction cost.

Sample questions

1. State whether TRUE or FALSE: Impact cost is low when the liquidity in the system is poor.
(a) True
(b) **False**

2. Which of the following costs is not actually paid by the market participants but arises due to lack of liquidity?
(a) Securities Transaction Tax
(b) **Impact cost**
(c) SEBI charges
(d) Brokerage

CHAPTER 3: INTRODUCTION TO FORWARDS AND FUTURES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Meaning of forward and futures contracts
- Terminology related to futures contracts
- Payoff for a futures contract
- Pricing of a futures contract
- Applications of a futures contract by speculators, hedgers and arbitrageurs

3.1 Introduction to forward contracts

A forward contract is an agreement made directly between two parties to buy or sell an asset on a specific date in the future, at the terms decided today. Forwards are widely used in commodities, foreign exchange, equity and interest rate markets.

Let us understand with the help of an example. What is the basic difference between cash market and forwards? Assume that on May 11, 2024 you want to purchase gold from a goldsmith. The market price for gold on this day is Rs. 62,130 for 10 grams of 24 carat gold and the goldsmith agrees to sell you gold at this price. You pay him Rs. 62,130 for 10 grams of gold and take delivery of the gold. This is a cash market transaction at a price (in this case Rs. 62,130) referred to as spot price.

Now suppose you do not want delivery of the gold on May 11, 2024, but only after 1 month. The goldsmith quotes you Rs. 62,337 for 10 grams of gold. You agree to the forward price for 10 grams of gold and go away. Here, in this example, you have "bought a forward contract" or you are "long forward", whereas the goldsmith has "sold a forward contract" or he is "short forward". There is no exchange of money or gold at this point of time. After 1 month, you come back to the goldsmith pay him Rs. 62,337 and take 10 grams of gold from him. This is a forward, where both the parties are obliged to go through with the contract irrespective of the value of the underlying asset (in this case gold) at the time of delivery.

Essential features of a forward are:

- It is a contract between two parties (a bilateral contract).
- All terms of the contract like price, quantity and quality of underlying, delivery terms like place, settlement procedure, etc. are fixed on the day of entering into the contract.

In other words, forwards are bilateral over-the-counter (OTC) transactions where the terms of the contract, such as price, quantity, quality, time and place are negotiated between two parties to the contract. Any alteration in the terms of the contract is possible if both parties agree to it. Corporations, traders and investing institutions extensively use OTC transactions to meet their specific requirements. The essential idea of entering into a forward is to fix the price and thereby avoid the price risk. Thus, by entering into forwards, one is assured of the price at which one can buy/sell an underlying asset.

In the above-mentioned example, if after one month the gold trades at Rs. 62,700 in the cash market, the forward contract becomes favourable to you because you can then purchase gold at Rs. 62,337 under this forwards contract and sell that gold in the spot market at Rs. 62,700 i.e., net profit of Rs. 363 per 10 grams. Similarly, if the spot price is 62,100 on that day, then you incur a loss of Rs. 237 per 10 grams (= buy price – sell price).

Major limitations of forwards

Liquidity Risk

Liquidity refers to the ability of the market participants to buy or sell the desired quantity of an underlying asset. As forwards are tailor-made contracts i.e., the terms of the contract are according to the specific requirements of the parties, other market participants may not be interested in these contracts. Forwards are not listed or traded on exchanges, which makes it difficult for other market participants to easily access these contracts or contracting parties. The tailor-made contracts and their non-availability on exchanges creates illiquidity in the contracts. Therefore, it is very difficult for parties to exit from the forward contract before the contract's maturity.

Counterparty risk

Counterparty risk is the risk of an economic loss from the failure of the counterparty to fulfil its contractual obligation. For example, A and B enter into a bilateral agreement, where A will purchase 100 kg of rice at Rs.40 per kg from B after 6 months. Here, A is counterparty to B and vice versa. After 6 months, if price of rice is Rs.50 in the market then B may decline his obligation to deliver 100 kg of rice at Rs.40 to A. Similarly, if price of rice falls to Rs.35 then A may purchase from the market at a lower price, instead of honouring the contract. Thus, a party to the contract may default on his obligation if there is incentive to default. This risk is also called default risk or credit risk.

In addition to the illiquidity and counterparty risks, there are several issues like lack of transparency, settlement complications as it is to be done directly between the contracting parties. A simple solution to all these issues is to bring these contracts to the centralized trading platform. This is what futures contracts do.

3.2 Futures contracts

Futures contracts were created to overcome the limitations of forwards. A futures contract is an agreement made through an organized exchange to buy or sell a fixed amount of a commodity or a financial asset on a future date at an agreed price. In simple terms, futures are standardised forward contracts that are traded on an exchange. The clearing corporation associated with the exchange guarantees settlement of these trades. A trader, who buys futures contract, takes a long position and the one, who sells futures, takes a short position. The words buy and sell are figurative only because no money or underlying asset changes hand, between buyer and seller, when the deal is originated.

Features of futures contracts

In a futures market, the exchange decides all the terms of the contract other than price. Accordingly, futures contracts have following features:

- Contract between two parties through Exchange
- Centralised trading platform (i.e., Exchange)
- Price discovery through free interaction of buyers and sellers
- Margins payable by both the parties
- Quality decided today (standardized)
- Quantity decided today (standardized)

Limitations of Futures Contract

- As futures are standardized contracts introduced by the exchanges, they too have certain limitations in the context of limited maturities, limited underlying set, lack of flexibility in contract design and increased administrative costs on account of MTM settlement, etc.

3.3 Contract specifications of futures contracts

The exchange decides all terms and conditions of futures contracts other than the price of the futures contract. These terms and conditions are known as ‘contract specifications. Contract specifications include the salient features of a derivatives contract like contract maturity, contract multiplier or contract size, tick size, etc. Let us understand these contract specifications with an example of a Nifty futures contract traded on the NSE.

Quotes given on the NSE website for Nifty futures as on Oct 03, 2025

1. Instrument type	:	Index futures
2. Underlying asset	:	Nifty 50
3. Expiry date	:	Oct 28, 2025
4. Open price (in Rs.)	:	24950.40
5. High price (in Rs.)	:	25020

6. Low price (in Rs.) : 24878.60

7. Closing price (in Rs.) : 25006.60

8. Underlying value (in Rs.) : 24894.25

Underlying instrument and underlying price: The underlying instrument refer to the index or stock on which the futures contract is traded. In the above example, the underlying asset is the Nifty 50 index. The underlying price is the spot price or the price at which the underlying asset trades in the cash market. In this example, the underlying price is the value of the Nifty index on October 03, 2025 which is 24894.25.

Contract multiplier or Contract Size: Futures contracts are traded in lots. The lot size or contract size for the index and stock futures is determined by the exchange. Contract sizes are different for each stock and index traded in the derivatives segment. The contract size can be changed by the exchange from time to time, depending upon the changes in the index level and stock prices. To arrive at the contract value, we must multiply the futures price with the contract multiplier (i.e., multiply the futures price with the lot size). Suppose, the contract size for the Nifty futures contract is 65. In the above example, the value of a Nifty futures contract can be calculated by multiplying the lot size with the closing futures price i.e., 65 * 24894.25 which works out to Rs. 16,18,126.25.

Clause 1.1.4 and Clause 2.1.4 of SEBI Master Circular for Stock Exchanges and Clearing Corporations dated October 16, 2023, stipulates contract size for index futures and index options respectively. The current stipulation is for such contracts to have a value between Rs. 5 lakhs and Rs. 10 lakhs. This limit was last set in 2015. Since then, broad market values and prices have increased by around three times. Given this, SEBI has decided that a derivative contract shall have a value not less than Rs. 15 lakhs at the time of its introduction in the market. Further, the lot size shall be fixed in such a manner that the contract value of the derivative on the day of review is within Rs. 15 lakhs to Rs. 20 lakhs. This will lead to increase in Lot Size to the extent that the Contract value will fall between Rs. 15 lakhs to Rs. 20 lakhs. These changes will be effective from Nov 2024.[3]

Contract Cycle: It is a period over which a contract trade. Index and stock futures contracts traded on the NSE follow a three-month trading cycle. Thus, on Oct 03, 2025, index and stock futures contracts on the NSE are available for trading for the near month (Oct 2025), the next month (Nov 2025) and the far month (Dec 2025). The BSE offers trading on monthly as well as weekly futures contracts.

Expiration Day: This is the day on which a derivative contract ceases to exist. It is the last trading day of the contract. On expiry date, all the contracts are compulsorily settled. If a

[3] SEBI Circular Ref: SEBI/HO/MRD/TPD-1/P/CIR/2024/132 Dated Oct 01, 2024

position is to be continued, then it must be rolled over to another futures contract of the same underlying. For a long position, this means selling the expiring contract and buying the next contract. Both the sides of a roll over should be executed at the same time. The Nifty and the Bank Nifty futures contracts and the stock futures contracts listed on the NSE expire on the last Tuesday of the respective month (or the day before if the last Tuesday is a trading holiday). In the above example, the Oct Nifty futures contract will cease to trade on Oct 28, 2025 and all open positions of the Oct series will be compulsorily settled by the exchange. A new contract (in this example - January 2025) is introduced on the trading day following the expiry day of the near month contract. The monthly futures contracts on the Nifty Financial Services Index expire on the last Tuesday of their expiry month. It will help to reduce market concentration risk and control expiry-day volatility in equity derivatives by regulating expiry days across stock exchanges.

Monthly and weekly futures contracts on the BSE Sensex and the BSE Bankex have different expiration dates.

🔻 **Key Measures**

- **Uniform Expiry Days**: Exchanges can **only choose either Tuesday or Thursday** as the expiry day for all equity derivatives contracts.
- **Weekly Contracts**: Each exchange can offer **only one benchmark index options contract per week**, and that too on the chosen expiry day.
- **Monthly Contracts**: All other equity derivative contracts (benchmark index futures, non-benchmark index derivatives, single stock futures/options) must have **a minimum 1-month tenor**.
- These should expire on the **last Tuesday or Thursday** of the month, based on the exchange's chosen day.
- **Change in Expiry Day Requires SEBI Approval**: Exchanges must seek prior SEBI approval before changing expiry days.

Example: If NSE chooses **Tuesday** as the expiry day:

- All monthly contracts (Nifty, Bank Nifty, single stocks) will expire on the **last Tuesday** of each month.
- NSE can offer **only one weekly benchmark index options** (say Nifty 50) expiring **every Tuesday**.

You may see the SEBI Circular[4] for more details.

[4] SEBI Circular Ref: SEBI/HO/MRD/TPD-1/P/CIR/2025/76 Dated May 26, 2025

NSE has chosen Tuesday as its expiry day, and BSE has chosen Thursday, with SEBI-mandated regulatory oversight on expiry changes.

Tick Size: It is the minimum move allowed in the price quotations. Exchanges decide the tick sizes on traded contracts as part of contract specification. Tick size for Nifty futures is 5 paisa. Bid price is the price the buyer is willing to pay and ask price is the price at which the seller is willing to sell.

Daily settlement price: The exchange follows a daily settlement procedure for open positions in equity index and stock futures contracts. All open positions are settled daily based on the daily settlement price of the futures contracts, which is calculated by the exchange on the basis of the last half-an-hour weighted average price of that futures contract. Thus, the daily settlement price is different for each futures contract of a different expiry month. In the above example, the daily settlement price of the Oct Nifty futures contract on Oct 03 is its closing price which is 25006.60.

Final settlement price: This is the price at which all open positions in the near-month futures contracts are finally settled on the expiration day of the near-month futures contract. The final settlement price is the closing price of the relevant underlying index or stock in the cash segment on the last trading day of the futures contract. In the above example, the final settlement price for the Oct Nifty futures contract will be the closing spot value of Nifty on the expiration date, i.e., on Oct 28, 2025 which is the last Tuesday of the expiry month.

Trading hours: The equity futures contracts can be traded during the normal market hours between 9.15 am and 3.30 pm from Monday to Friday. The exchange publishes a list of annual trading holidays and clearing holidays for the information of the market participants. Trading holidays are days on which no trading is possible as the exchanges are closed while clearing holidays are days on which the exchanges are open, and trading is possible but no clearing and settlement takes place as banks are closed.

The BSE Sensex futures contracts are based on the underlying BSE Sensex. These contracts have specifications that are somewhat different from the Nifty futures contracts as follows:

Underlying asset	BSE Sensex
Contract size	20
Tick size	Rs. 0.05

Contract cycle	7 serial weekly and 3 serial monthly contracts
Trading hours	9:15 a.m. to 3.30 p.m.
Expiration day	Monthly contracts: last Thursday of the contract month Weekly contracts: Thursday expiry
Final settlement	Cash settlement based on the closing price of the underlying index on the expiration day

(Please refer to the exchange website for any change into the product specification.)

The high correlation between the movements of the Sensex and Nifty enables market participants to trade in Nifty and Sensex futures as part of a pairs trading strategy. The availability of weekly futures contracts on the Sensex and a different expiration day (Thursday) for the Sensex futures provides better trading and hedging opportunities to market participants.

3.4 Some important terminology associated with futures contracts

Basis: The difference between the spot price and the futures price is called basis. If the futures price is greater than spot price, basis for the asset is negative. Similarly, if the spot price is greater than futures price, basis for the asset is positive. On Oct 03, 2025, spot price < futures price, thus basis for Nifty futures is negative (i.e., 24894.25 – 25006.60 = -112.35).

Importantly, basis for one-month contract would be different from the basis for two-or three-month contracts. Therefore, definition of basis is incomplete until we define the basis vis-a-vis a futures contract i.e., basis for one-month contract, basis for two-months contract, etc. It is also important to understand that the difference in the basis of a one month futures contract and two months futures contract should essentially be equal to the cost of carrying the underlying asset between first and second month. Indeed, this is the fundamental principle of linking various futures and underlying cash market prices together.

During the life of the contract, the basis may become negative or positive, as there is a movement in the futures price and spot price. Further, whatever the basis is, positive or negative, it becomes zero at maturity of the futures contract i.e., there should be no

difference between futures price and spot price at the time of maturity / expiry of contract. This happens because final settlement of futures contracts on last trading day takes place at the closing price of the underlying asset.

Cost of Carry

Cost of Carry is the relationship between futures prices and spot prices. It measures the storage cost (in commodity markets) plus the interest that is paid to finance or 'carry' the asset till delivery, less the income earned on the asset during the holding period. For equity derivatives, carrying cost is the interest paid to finance the purchase less (minus) dividend earned.

For example, assume the share of ABC Ltd is trading at Rs. 100 in the cash market. A person wishes to buy the share but does not have money. In that case he would have to borrow Rs. 100 at the rate of, say, 6% per annum. Suppose that he holds this share for one year and in that year, he expects the company to give 200% dividend on its face value of Rs. 1 i.e., dividend of Rs. 2. Thus his net cost of carry = Interest paid – dividend received = 6 – 2 = Rs. 4. Therefore, break even futures price for him should be Rs.104. It is important to note that cost of carry may be different for different participants.

Margin Account

As the exchange guarantees the settlement of all the trades, to protect itself against default by either counterparty, it charges various margins from brokers. Brokers in turn charge margins from their clients. Margins are briefly explained as follows:

Initial Margin

The amount one needs to deposit in the margin account at the time of entering into a futures contract is known as the initial margin. Let us take an example - On May 14, 2024 a person decided to enter into a futures contract. He expects the market to go up and so he takes a long Nifty Futures position for May expiry at Rs.22250.

The contract value = Nifty futures price * lot size = 22250 * 25 = Rs 5,56,250.

This is the contract value of the investor's long position in one Nifty Future contract expiring on May 30, 2024.

Assuming that the broker charges 10% of the contract value as initial margin, the investor has to give him Rs. 55,625 as initial margin. Both buyers and sellers of futures contract pay initial margin, as there is an obligation on both the parties to honour the contract.

The initial margin is dependent on price movement of the underlying asset. As high volatility assets carry more risk, the exchange would charge higher initial margin on them.

Marking to Market (MTM)

In futures market, while contracts have maturity of several months, profits and losses are settled on day-to-day basis – called mark to market (MTM) settlement. The exchange collects these margins (MTM margins) from the loss-making participants and pays to the gainers on day-to-day basis.

Let us understand MTM with the help of the example. Suppose a trader bought a futures contract on May 14, 2024 when the Nifty futures contract was trading at 22250. He paid an initial margin of Rs. 55,625 as calculated above. At the end of that day, Nifty futures contract closed at 22308.70. This means that the trader benefitted due to the 58.70 points gain on Nifty futures contract. Thus, the trader's MTM gain for the day was Rs 58.70 x 25 = Rs 1468. This money will be credited to the trader's account and next day the trader's position will start from 22308.70 (for the purpose of MTM computation).

Open Interest and Volumes Traded

The open interest is the total number of contracts outstanding (yet to be settled) for an underlying asset. It is important to understand that number of long futures as well as number of short futures is equal to the Open Interest. This is because total number of long futures will always be equal to total number of short futures. Only one side of contracts is considered while calculating/mentioning open interest. The level of open interest indicates depth in the market.

Volumes traded give us an idea about the market activity with regards to specific contract over a given period – volume over a day, over a week or month or over the entire life of the contract.

The following example explains the difference between open interest and traded volume.

Date	**Trade**	**Open Interest as on date**	**Trading Volume for the day**
March 1	A shorts 50 contracts B goes long in 50 contracts	50	50
March 2	C goes long in 100 contracts D goes short in 100 contracts	OI increases to 150 as new long and short position are created	100
March 3	A closes short position by buying back 50 contracts E shorts 50 contracts	OI remains at 150 because A's short position is replaced by E's short position	50
March 4	C closes long position by selling 100 contracts and D	OI falls to 50 as existing long and short positions are closed	100

	closes short position by buying back 100 contracts		

Price band

Price Band is essentially the price range within which a contract is permitted to trade during a day. The band is calculated with respect to the previous day's closing price of a specific contract. For example, the previous day closing price of a contract is Rs.100 and the price band for the contract is 10%, then the contract can trade between Rs.90 and Rs.110 for next trading day. On the first trading day of the contract, the price band is decided based on the closing price of the underlying asset in cash market. For example, if today is first trading day of a futures contract for an underlying asset i.e., company A, the price band for the contract is decided on the previous day's closing price of company 'A' stock in cash market. Price band is clearly defined in the contract specifications so that all market participants are aware of the same in advance. Sometimes, bands are allowed to be expanded at the discretion of the exchanges with specific trading halts.

Positions in derivatives market

As a market participant, you will always deal with certain terms like long, short and open positions in the market. Let us understand the meanings of commonly used terms:

Long position

Outstanding / unsettled buy position in a contract is called "Long Position". For instance, if Mr. X buys 5 contracts on Sensex futures, then he would be long on 5 contracts of Sensex futures. If Mr. Y buys 4 contracts on Nifty futures, then he has a long position in 4 contracts of Nifty futures.

Short Position

Outstanding / unsettled sell position in a contract is called "Short Position". For instance, if Ms. P sells 5 contracts on Sensex futures, then she would be short on 5 contracts on Sensex futures. If Ms. Q sells 4 contracts on Nifty futures, then she would be short on 4 contracts of Nifty futures.

Open position

Outstanding / unsettled either long (buy) or short (sell) position in various derivative contracts is called "Open Position". For instance, if Mr. X shorts 5 contracts on Infosys futures and goes long on 3 contracts of Reliance futures, he is said to be having open position, which is equal to short on 5 contracts of Infosys and long on 3 contracts of Reliance. If on the next day, he buys 2 Infosys contracts of same maturity, his open position would be – short on 3 Infosys contracts and long on 3 Reliance contracts.

Naked and calendar spread positions

Naked position in futures market simply means a long or short position in any futures contract without having any position in the underlying asset. Calendar spread position is a combination of two positions in futures on the same underlying - long on one maturity contract and short on a different maturity contract.

For instance, a short position in near month contract coupled with a long position in far month contract is a calendar spread position. Calendar spread position is computed with respect to the near month series and becomes an open position once the near month contract expires or either of the offsetting positions is closed.

A calendar spread is always defined with respect to the relevant months i.e., spread between August contract and September contract, spread between August contract and October contract, or spread between September contract and October contract, etc.

Opening a position

Opening a position means either buying or selling a contract, which increases client's open position (long or short).

Closing a position

Closing a position means either buying or selling a contract, which essentially results in reduction of client's open position (long or short). A client is said to be closed a position if he sells a contract which he had bought before, or he buys a contract which he had sold earlier.

3.5 Differences between Forwards and Futures

Feature	Forward contracts	Futures contracts
Operational mechanism	It is not traded on the exchanges.	It is an exchange-traded contract.
Contract specifications	Terms of the contracts differ from trade to trade (tailor made contract) according to the need of the participants.	Terms of the contracts are standardized. Except the price, all other terms of the contract are already fixed (standardized).
Counter-party risk	Exists, but at times gets reduced by a guarantor.	The clearing agency associated with exchange becomes the counter-party to all trades assuring guarantee on their settlement.
Liquidity profile	Low, as contracts are tailor-made catering to the needs of the parties involved. Further,	High, as contracts are standardised and exchange traded.

	contracts are not easily accessible to other market participants.	
Price discovery	Not efficient, as markets are scattered.	Efficient, centralised trading platform helps all buyers and sellers to come together and discover the price through common order book.
Quality of information and its dissemination	Quality of information may be poor. Speed of information dissemination is slow.	Futures are traded nationwide. Every bit of relevant information is quickly disseminated.

3.6 Payoff Charts for Futures contracts

Payoff Charts

Payoff on a position is the likely profit/loss that would accrue to a market participant with change in the price of the underlying asset at expiry. The payoff diagram is a graphical representation showing the price of the underlying asset on the X-axis and profits/losses on the Y-axis.

Payoff charts for futures

In case of futures contracts, long as well as short position has unlimited profit or loss potential. This results into linear payoffs for futures contracts. Futures payoffs are explained in detail below:

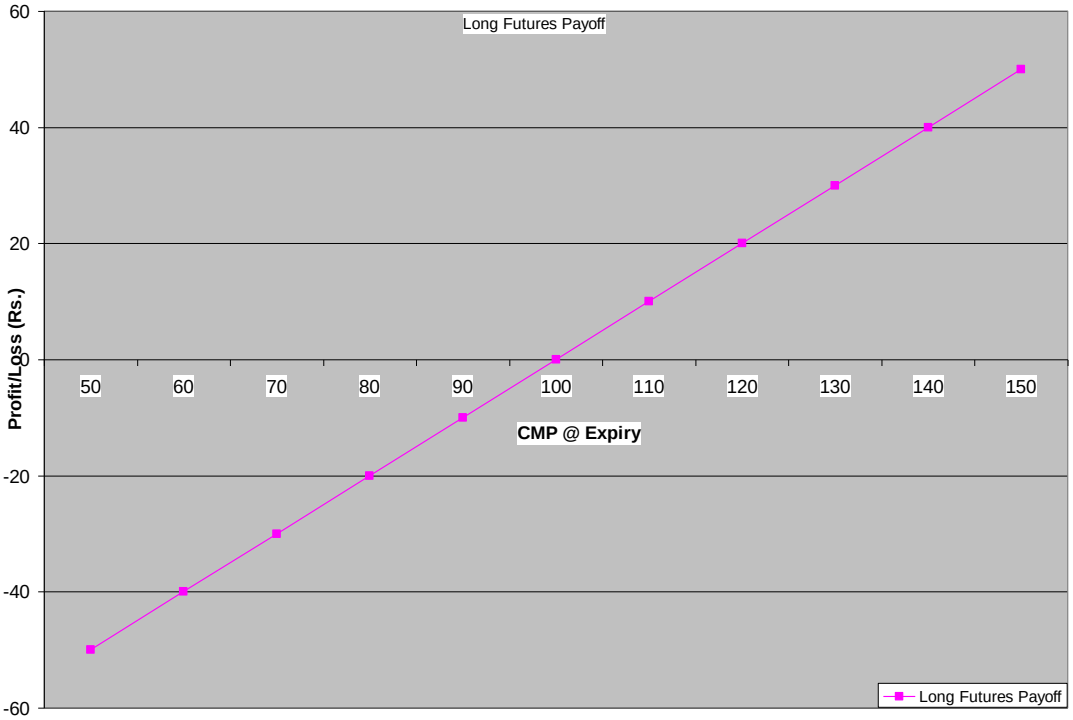
Payoff for buyer of futures: Long futures

Let us say a person goes long in a futures contract at Rs.100. This means that he has agreed to buy the underlying at Rs. 100 on expiry. Now, if on expiry, the price of the underlying is Rs. 150, then this person will buy at Rs. 100, as per the futures contract and will immediately be able to sell the underlying in the cash market at Rs.150, thereby making a profit of Rs. 50. Similarly, if the price of the underlying falls to Rs. 70 at expiry, he would have to buy at Rs. 100, as per the futures contract, and if he sells the same in the cash market, he will receive only Rs. 70, translating into a loss of Rs. 30.

This potential profit/loss at expiry when expressed graphically, is known as a payoff chart. The X Axis has the market price of the underlying at expiry. It increases on the Right-Hand Side (RHS). We do not draw the X Axis on the Left-Hand Side (LHS), as prices cannot go below zero. The Y Axis shows profit & loss. In the upward direction, we have profits and in the downward direction, we show losses in the chart.

The below table and payoff chart show long futures pay offs:

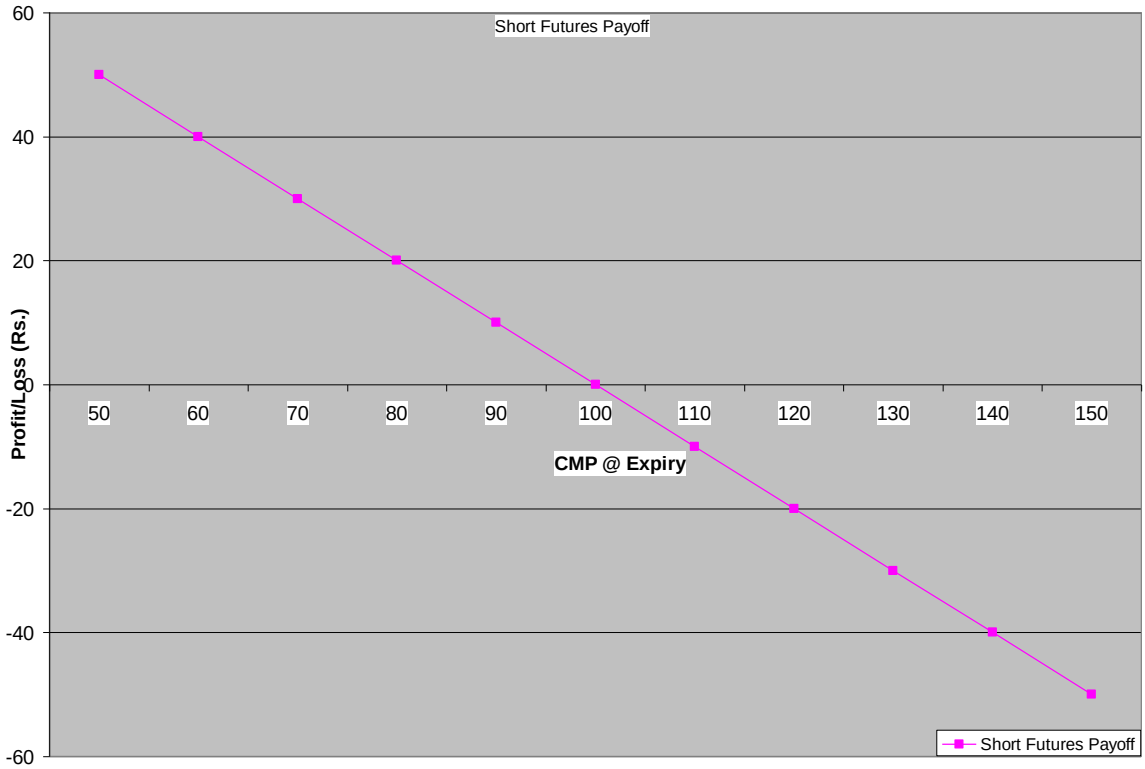
Long Futures at 100	
Market price at expiry	Long Futures Payoff
50	-50
60	-40
70	-30
80	-20
90	-10
100	0
110	10
120	20
130	30
140	40
150	50



Short Futures payoff

As one person goes long, some other person must go short, otherwise a deal will not take place. The profits and losses for the short futures position will be exact opposite of the long futures position. This is shown in the table and chart below:

Short Futures at 100	
Market price at expiry	Short Futures Payoff
50	50
60	40
70	30
80	20
90	10
100	0
110	-10
120	-20
130	-30
140	-40
150	-50



As can be seen, a short futures position makes profits when prices fall. If prices fall to 60 at expiry, the person who has shorted at Rs.100 will buy from the market at 60 on expiry and sell at 100, thereby making a profit of Rs. 40. This is shown in the above chart.

3.7 Futures pricing

Pricing of a futures contract depends on the characteristics of underlying asset. There is no single way to price futures contracts because different assets have different demand and supply patterns, different characteristics and cash flow patterns. This makes it difficult to design a single methodology for calculation of prices of futures contracts. Market participants use different models for pricing futures. Here, our discussion is limited to only two popular models of futures pricing - Cost of Carry model and Expectations model.

Cost of Carry Model for Futures Pricing

Cost of Carry model is also known as the no-arbitrage model. This model assumes that in an efficient market, arbitrage opportunities cannot exist. In other words, the moment there is an opportunity to make money in the market due to mispricing in the asset price and its replicas, arbitrageurs will start trading to profit from these mispricing and thereby eliminating these opportunities. This trading continues until the prices are aligned across the products/markets for replicating assets.

Let us understand the entire concept with the help of an example. Practically, forward/ futures position in a stock can be created in the following manner:

- Enter into a forward/futures contract, or
- Create a synthetic forward/futures position by buying that stock in the cash market and carrying it to the future date.

The price of acquiring the asset by a future date should be the same in both the cases i.e., cost of synthetic forward/futures contract (= spot price + cost of carrying the asset from today to the future date) should be equivalent to the present price of the forward/ futures contract. If these prices are not the same, then it will trigger arbitrage and will continue until prices in both the markets are aligned.

The cost of creating a synthetic futures position is the fair price of futures contract. Fair price of futures contract is nothing but the sum of spot price of underlying asset and cost of carrying the asset from today until delivery. Cost of carrying a financial asset from today to the future date would entail different costs like transaction cost, custodial charges, financing cost, etc. and for commodities, it would also include costs like warehousing cost, insurance cost, etc.

Let us take an example from the bullion market. Assume that the spot price of gold is Rs 62,130 per 10 grams. The cost of financing, storage and insurance for carrying the gold for a period of three months is Rs 100 per 10 grams. Now you purchase 10 grams of gold from the market at Rs 62,130 and hold it for three months. We may now say that the expected value of the gold after 3 months would be Rs 62,230 per 10 grams.

Assume the 3-month futures contract on gold is trading at Rs 62,280 per 10 grams. What should one do? Apparently, one should attempt to exploit the arbitrage opportunity present in the gold market by buying gold in the cash market and sell 3-month gold futures simultaneously. We borrow money to take delivery of gold in cash market today, hold it for 3 months and deliver it in the futures market on the expiry of our futures contract. Amount received on settling the futures contract could be used to repay the financier of our gold purchase. The net result will be a profit of Rs 50 without taking any risk. (Please note that we have not considered any transaction costs in this example).

Because of this mispricing, as more and more people come to the cash market to buy gold and sell in futures market, spot gold price will go up and gold futures price will come down. This arbitrage opportunity continues until the prices between cash and futures markets are aligned. Therefore, if futures price is more than the fair futures price, it will trigger "cash and carry arbitrage", which will continue until the prices in both the markets are aligned.

Similarly, if the futures price is less than the fair futures price, it will trigger "reverse cash and carry arbitrage" i.e., market participants will start buying gold in futures markets and sell gold in cash market. To do this, traders will borrow gold and deliver it to honour the contract in the cash market and earn interest on the cash market sales proceeds. After three months, they give gold back to the lender on receipt of the same in futures market. This reverse arbitrage will result in reduction of gold's spot price and increase of its futures price, until these prices are aligned and there is no further arbitrage left.

Cost of transaction and no-arbitrage bounds

Cost components of futures transaction like margins, transaction costs (commissions), taxes etc. create distortions and move the markets away from equilibrium. In fact, these cost components create no-arbitrage bounds in the market i.e., if the futures price is within these bounds around the fair futures price, arbitrage will not take place. In other words, because of the frictions in the market, for arbitrage to get triggered, it is important for the futures price to fall outside the no-arbitrage bounds in either direction for the arbitragers to make profit from the arbitrage opportunities.



No-arbitrage bounds

Practically, every component of carrying cost contributes towards widening of these no-arbitrage bounds. Here, we should appreciate that wider the no-arbitrage bounds, farther the markets are from the equilibrium. In other words, for the markets to be efficient, different costs of operating in the markets should be as low as possible. Lower costs would narrow the no-arbitrage bounds, which in turn would ensure the efficient price alignment across the markets.

Extension of Cost of Carry model to the assets generating returns

Let us extend the Cost of Carry model by adding the inflows during the holding period of underlying assets. For instance, underlying assets like securities (equity or bonds) may have certain inflows, like dividend on equity and interest on debt instruments, during the holding period. These inflows are adjusted in the computation of the fair futures price. Thus, modified formula of fair futures price or synthetic futures price is:

Fair futures price = Spot price + Cost of carry - Inflows

In mathematical terms, $F = S\ (1+r-q)^T$

Where F is fair price of the futures contract, S is the Spot price of the underlying asset, q is expected return during holding period T (in years) and r is cost of carry.

If we use the continuous compounding, we may rewrite the formula as: $F= Se^{(r-q)*T}$

Let us apply the above formula to the index futures market to find the fair futures price of an index. Suppose, you buy an index in cash market at 17500 level i.e., purchase of all the stocks constituting the index in the same proportion as they are in the index, cost of financing is 12% and the return on index is 4% per annum (spread uniformly across the year). Given this data, fair price of index three months down the line should be:

= Spot price * (1 + cost of financing – holding period return) ^ (time to expiration / 365)

= 17500 * (1+0.12-0.04) ^ (90/365)

= Rs. 17835.26

[Alternatively, we could use exponential form for calculating the futures value as: Spot Price * $e^{(r-q)T}$. Value in that case would have been: $17500*e^{((0.12-0.04)*90/365)}$ = Rs. 17848.63].

If the index futures is trading above 17848.63, we can buy index stocks in the cash market and simultaneously sell index futures to lock the gains equivalent to the difference between futures price and fair futures price. Note that the cost of transaction, taxes, margins, etc. are not considered while calculating the fair futures price.

Note: Cost of borrowing of funds and securities, return expectations on the held asset, etc. are different for different market participants. Perhaps the different fair values of futures contracts and no-arbitrage bounds for different market participants is what makes the market and trading take place on a continuous basis.

Assumptions of the Cost of Carry model

This model of futures pricing works under certain assumptions. The important assumptions are stated below (*):

- The underlying asset is available in abundance in cash market.
- Demand and supply in the underlying asset are not seasonal.
- Holding and maintaining of the underlying asset is easy and feasible.
- The underlying asset can be sold short.
- There are no transaction costs.
- There are no taxes.
- There are no margin requirements.

[*This is not an exhaustive list of the assumptions of the model but is the list of important assumptions]

The assumption that the underlying asset is available in abundance in the cash market means that we can buy and/or sell as many units of the underlying assets as we want. This assumption does not work especially when the underlying asset has a seasonal pattern of demand and supply. The prices of seasonal assets (especially commodities) vary drastically in different demand-supply environments. For example, in case of agricultural commodities, when new supplies arrive in the marketplace, prices tend to fall, whereas prices tend to be high just before the arrival of that new supply.

When an underlying asset is not storable i.e., the asset is not easy to hold/maintain, then one cannot carry the asset to the future. The Cost of Carry model is not applicable to these types of underlying assets.

Similarly, many a time, the underlying may not be sold short. This is true in case of seasonal commodities.

Even though this simple model does not discount for transaction cost, taxes, etc., we can always upgrade the formula to reflect the impact of these factors in the model. Margins are not considered while computing the fair value/ synthetic futures value. That is why this model is suitable for pricing forward contracts rather than futures contracts.

Thus, no generalized statement can be made with regard to the use of Cost of Carry model for pricing futures contracts. Assumptions of the model and characteristics of underlying asset can help us in deciding whether a specific asset can be priced with the help of this model or not. Further, suitable adjustments are made in the model to fit in the specific requirements of the underlying assets.

Convenience Yield

Let us touch upon one more concept in futures market called “Convenience Yield”. We need to go back and have a look at the formula for fair price of futures contract.

Fair price of futures contract = Spot price + Cost of carry – Inflows

As seen earlier inflows may be in the form of dividend (in case of equity) and interest (in case of debt). However, sometimes inflows may also be intangibles. Intangible inflows essentially mean values perceived by the market participants by holding the asset. These values may be in the form of convenience or perceived mental comfort by holding the asset.

For instance, in case of a natural disaster like a flood in a particular region, people start storing essential commodities like grains, vegetables and energy products (heating oil), etc. As a human tendency, we store more than what is required for our real consumption during a crisis. If every person behaves in similar way, then suddenly a demand is created for an underlying asset in the cash market. This indirectly increases the price of underlying assets. In such situations people derive convenience, just by holding the asset. This is termed as convenience yield or convenience return.

Convenience yield for a commodity is likely to be different for different people, depending on the way they use it or perceive it. Further, it may vary over a period. In fact, convenience is a subjective issue and is very difficult to price.

Convenience yield sometimes may dominate the cost of carry, which leads futures to trade at a discount to the cash market. In this case, reverse arbitrage is also not possible because no one lends traders the assets to sell short in the cash market. In such situations, practically, the cash and carry model breaks down and cannot be applied for pricing the underlying assets.

Note that the convenience yield mainly arises when there is a scarcity of a commodity (for example, crop failure due to natural calamities) and its inventory is low. Hence, convenience yield is usually observed in case of consumption assets (i.e., commodities) and not in case of financial assets (such as equities, bonds or currencies).

Expectations model of futures pricing

According to the expectations hypothesis, it is not the relationship between spot and futures prices, but that of expected spot and futures prices, which moves the market, especially in cases when the asset cannot be sold short or cannot be stored. It also argues that futures price is nothing but the expected spot price of an asset in the future. This is why market participants would enter futures contract and they price the futures based upon their estimates of the future spot prices of the underlying assets. According to this model:

- Futures can trade at a premium or discount to the spot price of underlying asset.
- Futures price gives market participants an indication of the expected direction of movement of the spot price in the future.

For instance, if futures price is higher than spot price of an underlying asset, market participants may expect the spot price to rise in the near future. This expectedly rising market is called “Contango market”. Similarly, if futures price is lower than spot price of an asset, market participants may expect the spot price to fall in future. This expectedly falling market is called “Backwardation market”.

3.8 Price discovery and convergence of cash and futures prices on the expiry

It is important to understand what the expectations hypothesis means. For instance, if we say that the May 2024 index futures contract is trading at 22308.70 on May 14, 2024, what does it mean? According to the expectations model of futures pricing, it means that as on May 14, the market expects the spot index to settle at 22308.70 at the closure of the market on last Thursday of May 2024 (i.e., on the last trading day of the contract which is May 30, 2024). The point is that every participant in the market is trying to predict the spot index level at a single point in time i.e., at the closure of the market on last trading day of the contract, which is Thursday in our example. This results in price discovery of spot index at a specific point in time. Thus, the futures prices are essentially expected spot price of the underlying asset, at the maturity of the futures contract. Accordingly, both futures and spot prices converge at the maturity of futures contract, as at that point in time there cannot be any difference between these two prices. This is the reason why all futures contracts on expiry settle at the underlying cash market price. This principle remains the same for all the underlying assets.

3.9 Uses of futures

Role of different participants in derivatives markets

The participants in the derivatives markets can be categorized as hedgers, speculators and arbitrageurs.

Hedgers

Corporations, Investing Institutions, banks and governments all use derivative products to hedge or reduce their exposures to market variables such as interest rates, share values, bond prices, currency exchange rates and commodity prices. The classic example is the farmer who sells futures contracts to lock into a price for delivering a crop on a future date. The buyer might be a food-processing company, which wishes to fix a price for taking delivery of the crop in the future. Another example could be that of an investor with a diversified equity portfolio, who wants to protect his portfolio from any temporary correction in the stock market. Such an investor could sell index futures for this purpose.

Speculators/Traders

Futures contracts are very well suited to trading on the prices of financial assets and commodities. It is much less expensive to create a speculative position using futures than

by actually trading the underlying asset. As a result, the potential returns are much greater. A classic application is the trader who believes that the announcement of better-than-expected quarterly results of a company will boost the stock price of that company. He has two options: the first alternative is to buy and hold the equity shares of the company whereas the other alternative is to go long the futures contracts of that stock. If the trader chooses the second option to go long futures contract on the underlying stock and the stock price increases, the value of the contract will also rise, and he can square-off the position to book his profit. Of course, if the trader takes a long position and the stock price falls, the futures price will also fall, leaving the trader with a large loss. Leverage acts as a 'double-edged' sword. Therefore, positions in futures contracts, which are basically leveraged instruments, are riskier in nature than buying or selling the underlying asset itself.

Arbitrageurs

An arbitrage is a deal that produces risk-free profits by exploiting a mispricing in the market. A simple arbitrage occurs when a trader purchases an asset cheaply in one location/ exchange and simultaneously arranges to sell it at another location/ exchange at a higher price. Such opportunities are unlikely to persist for very long, since arbitrageurs would rush in to buy the asset in the cheaper market and simultaneously sell it in the expensive market, thus reducing the pricing gap.

As mentioned above, there are three major players in derivatives market – Hedgers, Traders, and Arbitrageurs. Hedgers aim to hedge their risk, traders take the risk which hedgers plan to offload from their exposure and arbitrageurs establish an efficient link between different markets.

Traders take naked positions in the futures market i.e., they go long or short in various futures contracts available in the market. Indeed, the capacity of derivatives market to absorb buying/selling by hedgers is directly dependent upon availability of traders, who act as counter-party to hedgers. Thus, traders form one of the most important participants of the derivatives market, providing depth to the market. Hedgers may not be able to hedge, if traders were not present in the system. Therefore, the presence of both hedgers and traders is essential for the growth of the futures market.

For instance, assume, a farmer expects the price of wheat to fall in near future. He wants to hedge his price risk on wheat produce for next 3 months till the time he has actual produce in his hands and so would like to lock in the forward/ futures price now. Accordingly, the farmer can sell futures contracts on the expected quantity of produce. In order to sell this futures contract, he needs a buyer. This buyer may be someone who needs wheat after three months, may be a flour mill or a bakery. However, most of the

times, there is a demand supply mismatch in the market and the trader fills the gap between demand and supply.

Here the trader, who is a counterparty to the farmer, has a contrary view i.e., this buyer will buy only if he thinks that the actual price of wheat three months down the line is going to be higher than the three-month futures price today. Further, the profit of the trader would depend upon actual wheat price being more than the contracted futures price at the maturity of futures contract. If that happens, the trader will make money, else he would lose money.

In addition to hedgers and traders, to establish a link between various markets like spot and derivatives, we need a third party called the arbitrageur. These arbitragers continuously hunt for the profit opportunities across the markets and products and seize those by executing trades in different markets and products simultaneously. Importantly, arbitrageurs generally lock in their profits unlike traders who trade naked contracts.

For example, at the end of day:

Market price of underlying asset (in Rs.)	100
May futures	110
Lot size	50

Here an arbitrageur will buy in the cash market at Rs. 100 and sell in the Futures market at Rs. 110, thereby locking Rs. 10 as his profit on each share.

On the expiration date, suppose price (in Rs.) of the underlying asset is 108.

	Cash Market		Futures	
Buy	100		Sell	110
Sell	108		Buy	108
	+8			+2

Total profit would be Rs 2 + Rs 8 = Rs 10 per unit and Rs 10 * 50 = Rs 500 for the lot.

Suppose price (in Rs.) of the underlying asset is 95 on the expiration date.

	Cash Market		Futures	
Buy	100		Sell	110
Sell	95		Buy	95
	-5			+15

Total profit would be Rs 15 - Rs 5 = Rs 10 per unit and Rs 10 * 50 = Rs 500 for the lot.

Transaction costs and impact cost have not been considered in the above example. In real life, the transaction costs such as brokerage, Service Tax, Securities Transaction Tax, etc. must be considered.

Here, it may be interesting to look at the risks these arbitrageurs carry. As seen before, arbitrageurs execute positions in two or more markets/products simultaneously. Even if the systems are seamless and electronic and both the legs of transaction are liquid, there

is a possibility of some time lag between the execution of both the orders. If either leg of the transaction is illiquid then the risk on the arbitrage deal is huge as only one leg may get executed and another may not, which would open the arbitrager to the naked exposure of a position. Similarly, if contracts are not cash settled in both or one of the markets, it would need reversal of trades in the respective markets, which would result in additional risk on unwinding position with regard to simultaneous execution of the trades.

These profit focused traders and arbitrageurs fetch enormous liquidity to the products traded on the exchanges. This liquidity in turn results in better price discovery, lesser cost of transaction and lesser manipulation in the market.

Uses of Index futures

Equity derivatives instruments facilitate trading of a component of price risk, which is inherent to investment in securities. Price risk is the price movement of the asset held by a market participant, in an unfavourable direction. This risk is broadly divided into two parts: (i) specific risk or unsystematic risk, and (ii) market risk or systematic risk.

Unsystematic Risk

Specific risk or unsystematic risk is the component of price risk that is unique to specific events pertaining to the company and/or industry. Examples of specific risk include the risk of a fall in stock price due to a strike by factory workers which affects the production and sales, the risk of sudden departure of key managerial personnel, risk of loss of market share due to emergence of a strong competitor etc. Specific risk is inseparable from investing in the securities. This risk could be reduced to a certain extent by diversifying the portfolio.

Systematic Risk

An investor can diversify his portfolio and eliminate a major part of price risk i.e., the diversifiable/unsystematic risk. What is left is the non-diversifiable portion or the market risk, known as systematic risk. Variability in a security's total returns that are directly associated with overall movements in the general market or economy is called systematic risk. Examples of market risk or systematic risk include risk due to a sudden change in the monetary or fiscal policy, depreciation of domestic exchange rates, declaration of war, etc. Thus, every portfolio is exposed to market risk. This risk is separable from the investment and tradable in the market with the help of index-based derivatives. Therefore, the total price risk in a stock investment is the sum of systematic risk (i.e., market risk) and unsystematic risk (i.e., risk specific to that stock).

We can use single stock futures to manage the risk of the equity investment in the spot market. For instance, use of single stock futures would hedge the market participant

against the total risk in the equity investment because these futures are comparable with underlying positions. The main difference between an underlying position and single stock futures is on the settlement front: in case of cash transactions, settlement takes place immediately and in case of futures contracts, settlement is deferred.

While single stock futures enable the investor to hedge the specific risk of a stock, index futures are required to mitigate the systematic risk of a stock portfolio. Before we get to the management of systematic risk with index futures, we need to understand beta - a measure of systematic risk of a security that cannot be avoided through diversification. It measures the sensitivity of a stock / portfolio vis-a-vis index movement over a period, on the basis of historical prices. Suppose a stock has a beta equal to 2. This means that historically this stock's price has moved 20% when the index moved 10%, indicating that this stock is more volatile than the index. Stocks (or portfolios) having beta more than 1 are called aggressive stocks (or aggressive portfolios) and those having beta less than 1 are called conservative stocks (or conservative portfolios).

Betas of individual stocks are used to calculate beta of a portfolio. Portfolio beta is a weighted average of betas of individual stocks in the portfolio based on their investment proportion. For example, if there are four stocks in a portfolio with betas 0.5, 1.1, 1.30 and 0.90 having weights 35%, 15%, 20% and 30% respectively, the beta of this portfolio would be 0.87 (= 0.5*0.35 +1.10*0.15 +1.30*0.20 +0.90*0.30).

A generalized formula for portfolio beta can be written as $W1\ \beta1+W2\ \beta2+\ldots+ Wn\ \beta n= \beta p$

Where, W1 is weight of stock 1, β1 is the β of stock 1, W2 is weight of stock 2, β2 is the β of stock 2, …, Wn is weight of stock n, βn is the β of stock n and βp is the β of portfolio. Please note that sum of the weights will be equal to 1 (i.e., W1+W2+…+Wn = 1).

Information on beta of individual stocks is readily available in various financial newspapers, magazines and information vending networks like Bloomberg, Reuters, etc.

When stock futures are used to hedge the risk of a single stock, we can use a hedge ratio of 1:1. For instance, suppose that an investor holds 550 shares of HDFC Bank and this is her only investment. If the investor is worried about a temporary fall in the stock price due to some company-specific news, she can use futures on HDFC Bank stock to hedge her shareholding. Since the contract size of HDFC Bank futures is 550, she can use 1 futures contract to hedge her holding of 550 shares. Thus, a 1:1 hedge ratio can be used to compute the number of futures contracts required to hedge the risk. But futures contracts are available only on a limited set of stocks and hence we can use index futures to hedge the remaining stocks which do not have their own futures contracts.

When index futures are used to manage the systematic risk of a portfolio, we cannot use a hedge ratio of 1:1. This is because the portfolio to be hedged is different from the

hedging instrument, which is the index futures contract. Suppose that the investor holds a portfolio comprising of 10 large-cap stocks and wishes to hedge this portfolio with an index futures contract. Now, the index futures contract may represent an index comprising 30 or 50 stocks and hence it is not a perfect hedge for the investor's portfolio that includes just 10 stocks. Moreover, the beta of this portfolio may be different from that of the index. Hence, a 1:1 hedge ratio is not appropriate for this situation. To find the number of contracts of index futures required for hedging this portfolio's risk, the hedge ratio is calculated as follows:

Number of contracts for hedging portfolio risk = Vp * βp / Vi
Vp: Value of the portfolio
Bp: Beta of the portfolio
Vi: Value of index futures contract

Value of index futures contract or contract size = futures index level * contract multiplier. For simplification purpose, beta of futures index vis-a-vis spot index is taken as one.

Hedge against the systematic risk mainly depends upon the relationship of the portfolio with the index, which is measured by beta. A portfolio has different relationships with different indices used for hedge. Hence, the hedge ratio would change with the change in the index. Further, there is an assumption that the past relationship between the stock's or portfolio's movement and the index movement would continue in future. This may result in some difference between actual and expected numbers.

Hedging using single stock futures and index futures is explained in detail in Unit 5 with specific examples.

Important terms in hedging

Long hedge: Long hedge is the transaction when we hedge our position in cash market by going long in futures market. For example, we expect to receive some funds in future and want to invest the same amount in the securities market. We have not yet decided the specific company/companies, where investment is to be made. We expect the market to rise in the near future and bear a risk of acquiring the securities at a higher price. We can hedge by going long index futures today. On receipt of money, we may invest in the cash market and simultaneously unwind corresponding index futures positions. Any loss due to acquisition of securities at higher price, resulting from the upward movement in the market over this intermediate period, would be partially or fully compensated by the profit made on our position in index futures.

Further, while investing, suitable securities at reasonable prices may not be immediately available in sufficient quantity. Rushing to invest all money is likely to drive up the prices to our disadvantage. This situation can also be taken care of by using the futures. We may

buy futures today, gradually invest money in the cash market and unwind corresponding futures positions.

Short hedge: Short Hedge is a transaction when the hedge is accomplished by going short in futures market. For instance, assume, we have a portfolio and want to liquidate it in the near future but we fear that the prices will fall in near future. This may go against our plan and may result in reduction in the portfolio value. To protect our portfolio's value, today, we can short index futures of an equivalent amount. The amount of loss made in cash market will be partly or fully compensated by the profits on our futures positions.

Cross hedge: When a futures contract on an asset is not available, market participants look for an asset that is closely associated with their underlying and trade in the futures market of that closely associated asset, for hedging purpose. They may trade in futures of this related asset to protect the value of their actual asset. This is called cross hedge.

For instance, if futures contracts on jet fuel are not available in the international markets then hedgers may use contracts available on other energy products like crude oil, heating oil or gasoline due to their close association with jet fuel for hedging purpose. This is an example of cross hedge.

Indeed, in a crude sense, we may say that when we use index futures to hedge against the market risk on a portfolio, we are essentially establishing a cross hedge because we are not using the exact underlying to hedge the risk.

Hedge contract month: Hedge contract month is the maturity month of the contract through which we hedge our position. The thumb rule is to select that futures contract which expires just after the date on which we wish to unwind our exposure. For example, suppose that on May 10, an investor decides to sell his portfolio on June 20 to meet some financial obligation. He wants to hedge the market risk of his portfolio by shorting index futures. In this case, the investor should short the index futures contract expiring in June 2024, and not in May 2024.

Trading in futures market

Traders are risk takers in the derivatives market. And they take positions in the futures market without having any position in the underlying cash market. These positions are based upon their expectations on price movement of underlying asset. Traders either take naked positions or spread positions.

A trader takes a naked long position when he expects the market to rise. Profit is made by reversing the long position at a higher price later. Similarly, he takes a short position when he expects the market to fall and books a profit by reversing his position at a lower price in the future. For instance, if one month Sensex futures contract is trading at 61000

and a trader expects the spot index at the maturity of the one-month contract would settle at a level higher than this, he would take a long position in index futures at a level of 61000. If his expectation comes true and index on maturity settles beyond 61000, this trader will make money to the extent of the difference between buy price and sell price (or, between buy price and settlement price) of the index.

Traders may also take long/short positions in single stock futures. When they expect the stock price to rise, they may take long position in these futures and when they expect the stock price to fall, they may take short position in single stock futures.

If the market or the stock moves in the expected direction, the trader would end up making profit. Here, it may be noted that if the market or stock does not move in the anticipated direction, the trader may also incur a loss. A futures position is as exposed to loss as to profit.

A naked position is long or short in any of the futures contracts but a spread position consists of two opposite positions (one long and one short), either in two contracts with the same maturity on different products, or in two contracts with different maturities on the same product. The former is termed an inter-commodity or inter-product spread and the latter is known as calendar spread/time spread or horizontal spread. Exchanges need to provide the required inputs to the trading system for it to recognize any kind of spread. At present, only calendar spreads are available for trading in the equity derivatives segment. Inter-commodity spreads between specific commodities like gold and silver; soybean, soybean meal and soybean oil, etc. are available for trading in the commodity derivatives segment.

A calendar spread position is always computed with respect to the near month series. For instance, if Mr. A has say 3 contracts short in one-month futures contract, 2 contracts long in two-months futures contract and 3 contracts long in three-months futures contract, he would be said to have 2 calendar spreads between first and second months and 1 calendar spread between first and third month. Further, his position in remaining 2 three-months contracts would be treated as naked. A calendar spread becomes a naked/open position, when the near month contract expires or either of the legs of spread is closed. As spread positions are hedged to a large extent because they are combinations of two opposite positions, they are treated as conservatively speculative positions.

Arbitrage opportunities in futures market

Arbitrage is the simultaneous purchase and sale of an asset or replicating asset in the market in an attempt to profit from discrepancies in their prices. Arbitrage involves activity on one or several instruments/assets in one or different markets, simultaneously.

Important point to understand is that in an efficient market, arbitrage opportunities may exist only for a brief period, or not at all. The moment arbitragers spot an arbitrage opportunity, they initiate the arbitrage trades, thereby eliminating that arbitrage gap.

Arbitrage occupies a prominent position in the futures world as a mechanism that keeps the prices of futures contracts aligned properly with the prices of the underlying assets. The objective of arbitragers is to make profits without taking risk, but the complexity of this activity is such that it may result in losses as well. Well-informed and experienced professional traders, equipped with powerful calculating and data processing tools, normally undertake arbitrage trades.

Arbitrage in the futures market can typically be of three types:

- Cash and carry arbitrage: Cash and carry arbitrage refers to a long position in the cash or underlying market and a short position in futures market.
- Reverse cash and carry arbitrage: Reverse cash and carry arbitrage refers to long position in futures market and short position in the underlying or cash market.
- Inter-Exchange arbitrage: This arbitrage entails two positions on the same contract in two different markets/exchanges.

In the language of simple mathematics, Fair futures price $F = S + C$

where S stands for Spot price and C stands for Holding costs/carrying costs.

If cost of carry is defined in the percentage terms, we may redefine the formula as:

$F = S(1+r)^T$

Where r is the carrying cost (in percentage) and T is the Time to expiration (in years).

If we use continuous compounding for computation of the cost, the same formula reduces to:

$F= Se^{rT}$

If futures price is higher than fair/theoretical price, there would exist a profitable, risk-free, cash and carry arbitrage opportunity. On the other hand, if the futures price is lower than the fair futures price, there could be a profitable opportunity for reverse cash-carry arbitrage. Thus, unless there are obstacles to such arbitrage, the activities of the arbitrageurs would cause spot-futures price relationships to conform to that described by the cost of carry formula. On rare occasions, however, there is an arbitrage opportunity that exists for some time. Practically, an arbitrage is feasible and will be undertaken only if it provides net cash inflow after transaction costs, brokerage, margin deposits, etc. Arbitrage strategies are explained in detail in Unit 5 with examples.

Inter-market arbitrage

This arbitrage opportunity arises because of some price differences existing in the same underlying at two different exchanges. If August futures on stock Z are trading at Rs. 101 at NSE and Rs. 100 at BSE, the trader can buy a contract at BSE and sell at NSE. The positions could be reversed over a period of time when difference between futures prices squeeze. This would be profitable to an arbitrageur.

It is important to note that the cost of transaction and other incidental costs involved in the deal must be analysed properly by the arbitrageurs before entering into the transaction.

In the light of above, we may conclude that futures provide market participants with a quick and less expensive mode to alter their portfolio composition to arrive at the desired level of risk. As they could be used to either add risk to the existing portfolios or reduce risk of the existing portfolios, they are essentially risk management and portfolio restructuring tools.

Sample questions

1. You sold one XYZ Stock Futures contract at Rs. 278 and the lot size is 1,200. What is your profit (+) or loss (-), if you purchase the contract back at Rs. 265?
(a) 16,600
(b) **15,600**
(c) -15,600
(d) -16,600

2. You have taken a short position of one contract in June XYZ futures (contract multiplier 50) at a price of Rs. 3,400. When you closed this position after a few days, you realized that you made a profit of Rs. 10,000. Which of the following closing actions would have enabled you to generate this profit? (You may ignore brokerage costs.)
(a) Selling 1 June XYZ futures contract at 3600
(b) Buying 1 June XYZ futures contract at 3600
(c) **Buying 1 June XYZ futures contract at 3200**
(d) Selling 1 June XYZ futures contract at 3200

3. A calendar spread contract in index futures attracts _____.
(a) Same margin as sum of two independent legs of futures contract
(b) **Lower margin than sum of two independent legs of futures contract**
(c) Higher margin than sum of two independent legs of futures contract
(d) No margin needs to be paid for calendar spread positions

4. Margins in 'Futures' trading are to be paid by _____.
(a) Only the buyer
(b) Only the seller
(c) **Both the buyer and the seller**
(d) The clearing corporation

5. When the near leg of the calendar spread transaction on index futures expires, the farther leg becomes a regular open position.
(a) **True**
(b) False

CHAPTER 4: INTRODUCTION TO OPTIONS

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Concept of Options
- Payoffs in case of option contracts
- Difference between futures and options
- Fundamentals relating to option pricing
- Option Greeks and Implied volatility
- Analysis of options from the perspective of option buyers and sellers

4.1 Basics of options

As seen in earlier section, forward/futures contract is a commitment to buy/sell the underlying and has a linear payoff, which indicates unlimited losses and profits. However, some market participants desire to ride the upside but restrict the downside. Accordingly, options have emerged as a financial instrument, as they allow unlimited profits on buying or selling of the underlying asset with a provision of restricting the losses.

An option is a contract that gives the holder of the option the right, but not an obligation, to buy or sell the underlying asset on or before a stated date/day, at a predetermined price. This right can be bought for a price known as the option premium. The party taking a long position i.e., buying the option is called buyer/ holder of the option and the party taking a short position i.e., selling the option is called the seller/ writer of the option. The option buyer must pay the premium to the option seller upfront, i.e., at the time of buying the option.

The option buyer or holder has the right but no obligation with regards to buying or selling the underlying asset, while the option writer has the obligation in the contract. Therefore, the option buyer will exercise his option only when the situation is favourable to him. On the other hand, the option writer is legally bound to honour the contract whenever the option buyer decides to exercise his option.

Options may be categorized into two main types:

- Call Options
- Put Options

An option, which gives the buyer/holder a right to buy the underlying asset, is called a call option; and an option which gives the buyer/holder a right to sell the underlying asset, is called a 'put option'.

Option terminology

There are several terms used in the options market. Let us understand those terms with the help of the following example:

Quote for a Nifty **call** option as on May 10, 20XX:

1. Instrument type	:	Option Index
2. Underlying asset	:	Nifty 50
3. Expiry date	:	May 25, 20XX
4. Option type	:	Call European
5. Strike Price	:	18400
6. Open price	:	125
7. High price	:	130
8. Low price	:	93.65
9. Close price	:	124.50
10. Traded Volume	:	61,330 contracts
11. Open Interest	:	14,97,650
12. Underlying value	:	18315.10

Quote for a Nifty **Put** option as on May 10, 20XX:

1. Instrument type	:	Option Index
2. Underlying asset	:	Nifty 50
3. Expiry date	:	May 25, 20XX
4. Option type	:	Put European
5. Strike Price	:	18400
6. Open price	:	193.55
7. High price	:	236
8. Low price	:	171.50
9. Close price	:	177.60
10. Traded Volume	:	31,388 contracts
11. Open Interest	:	497950
12. Underlying value	:	18315.10

Index option: These options have a stock index as the underlying asset. For example, options on Nifty, Sensex, etc.

Stock option: These options have individual stocks as the underlying asset. For example, option on ONGC, NTPC, etc.

Buyer of an option: The buyer of an option is one who has a right but not the obligation in the contract. For owning this right, he pays a price called 'option premium' to the seller

of this right. He has a right to buy the underlying asset in case of a call option and the right to sell the underlying asset in case of a put option.

Writer of an option: The writer of an option is one who receives the option premium and is thereby obliged to sell/buy the asset if the buyer of option exercises his right. He has a sell obligation in case of a call option (i.e., when the call option holder exercises his right to buy) and a buy obligation in case of a put option (i.e., when the put option holder exercises his right to sell).

American option: The owner (buyer/holder) of an American option can exercise his right at any time on or before the expiry date/day of the contract.

European option: The owner (buyer/holder) of a European option can exercise his right only on the expiry date/day of the contract. In India, all index and stock options are European style options.

Option Premium: It is the price which the option buyer pays to the option seller. In our examples, the option premium is Rs. 124.50 for the call option and Rs. 177.60 for the put option, both having a strike price of 18400 and expiring on May 25, 20XX. The premium mentioned here is for a single unit of Nifty options and to arrive at the total premium for the contract, we must multiply this premium with the lot size.

Spot price (S): It is the price at which the underlying asset is trading in the spot market. In our examples, it is the value of underlying index (Nifty 50) which was 18315.10 at that point of time.

Strike price or Exercise price (X): Strike price is the price per share for which the underlying security may be purchased by the call option holder (or sold by the put option holder). In our examples, strike price for both call and put options is 18400.

Open Interest: As discussed in futures section, the open interest is the total number of option contracts outstanding for an underlying asset.

Exercise of Options: Option contracts traded on Indian exchanges are European style options. Hence, buyers can exercise their options only at the time of maturity of these contracts. All these options are exercised with respect to the settlement value/ closing price of the stock on the day of exercise of option.

Assignment of Options

Assignment of options means the allocation of exercised options to one or more option sellers.

Opening a Position

An opening transaction is one that adds to or creates a new trading position. It can be either a purchase or a sale. With respect to an option transaction, we will consider both:

- Opening purchase (Long on option): A transaction in which the purchaser's intention is to create or increase a long position in a given series of options.
- Opening sale (Short on option): A transaction in which the seller's intention is to create or increase a short position in a given series of options.

Closing a position

A closing transaction is one that reduces or eliminates an existing position by an appropriate offsetting purchase or sale. This is also known as "squaring off" the existing position. With respect to an option transaction:

- Closing purchase: A transaction in which the purchaser's intention is to reduce or eliminate a short position in a given series of options. This transaction is frequently referred to as "covering" a short position.
- Closing sale: A transaction in which the seller's intention is to reduce or eliminate a long position in a given series of options.

Note: A trader does not close out a long call position by purchasing a put (or any other similar transaction). A closing transaction for an option involves the sale or purchase of an option contract with the same terms (contract specifications), i.e., an option with the same strike price and same expiry date.

4.2 Contract specifications of exchange-traded options

Just as in the case of exchange-traded futures, the exchange decides all terms and conditions (except the option premium) for all exchange-traded index and stock options. The common contract specifications are discussed below:

Contract size or Lot size: Contract size is the number of units of the underlying asset in a contract. The contract size is different for option contracts on different stocks and indices. Suppose the contract size of Nifty option contracts is at 50. Accordingly, in our examples above, the total premium for call option contract would be Rs 124.50 * 50, i.e., Rs 6225 and that for the put option contract would be Rs 177.60* 50, i.e., Rs 8880.

Contract trading cycle: This is the period over which the option contract is traded. Index options in India are available for a wider range of expiration dates as compared to stock options. Option contracts on individual stocks traded on the NSE follow a three-month trading cycle. Thus, on May 10, 20XX, stock option contracts launched on the NSE are available for trading for the near month (May 20XX), the next month (June 20XX) and the far month (July 20XX).

Index option contracts on the NSE and BSE are available for trading with weekly as well as monthly maturities. Index options can be traded for 4 serial weekly cycles, excluding the monthly near-, mid- and far-month expiries. Thus, on May 10, 2023, we have weekly

Nifty options expiring on May 11, May 18, June 1 and June 8, in addition to the monthly option contracts expiring on May 25, June 29 and July 27. Index options are also available for three quarterly expiries (March, June, September and December cycle). The exchanges also make available long-term index options having 8 half-yearly expiries (following the June-December cycle) after the three quarterly expiries.

Expiration Date: The day on which a derivative contract ceases to exist is known as the expiration date. It is the last trading date/day of the contract. The Nifty and Bank Nifty option contracts expire on the last Tuesday of the expiry month (or, on the previous trading day, if the last Tuesday is a trading holiday). BSE and NSE decides the contract expiry day of various indices offered by them and the same is subject to change after due notice to market participants. One must see the product specification of various indices offered by BSE and NSE to ascertain their monthly/ weekly expiry date.

As per recent SEBI Circular dated Oct 01, 2024, exchanges may provide derivatives contracts for only one of its benchmark indices with weekly expiry. This will be effective from Nov 20, 2024. For ex. BSE can only offer weekly Index derivative contract either on Sensex 30 or Bankex. Similarly, NSE also can offer weekly expiry on only one Index.

Tick size: It is the minimum move allowed in the price quotations. As in the case of stock and index futures contracts, the tick size for index contracts is 5 paisa.

Tick size for stock future contracts is the smallest amount a price can change. It is determined by the exchange where the asset is traded and depends on factors like the type of asset, its price, and the market it's traded in.

Here are some examples of tick sizes for stock future contracts:

NSE: The tick size for stocks trading below ₹250 is 0.01 paisa and for stocks trading above ₹250 is 0.05 paisa, and this change also applies to futures contracts of these stocks.

BSE: The usual tick size is 0.05 paisa but tick size is 0.01 for stocks trading below ₹100.

Tick size can affect margin requirements, risk management, and price fluctuations. A small tick size allows for better risk management because positions can be adjusted with small price movements. A large tick size may require higher margins due to the potential for larger price fluctuations.

One may look up the product specifications on the respective exchange website (NSE / BSE) to find the tick size for a particular derivative contract.

Final settlement price: Unlike the futures contracts, there is no daily settlement of options contracts. Also, since all exchange-traded index and stock options in India are European style options, the exercise and assignment of these options is permitted only on the expiration date. The final settlement price of index and stock options is the closing

price of the relevant index or stock in the cash segment of the exchange on the last trading day of the contract.

Trading hours: The equity options contracts can be traded during the normal market hours between 9.15 am and 3.30 pm from Monday to Friday. The exchange publishes a list of annual trading holidays and clearing holidays for the information of the market participants.

The option contracts on the BSE Sensex have slightly different specifications as compared to the Nifty option contracts and are discussed here.

Underlying asset	BSE Sensex
Contract size	20
Tick size	Rs. 0.05
Contract cycle	7 serial weekly, 3 monthly, 3 quarterly and 8 semi-annually maturing contracts
Trading hours	9:15 a.m. to 3:30 p.m.
Exercise style	European
Expiration day	Monthly, Quarterly and Semi-annually – last Thursday of the contract Weekly contracts – Thursday expiry
Final settlement	Cash settlement based on the closing price of the underlying index on the expiration day

(Please refer to the exchange website for any change into the product specification.)

4.3 Moneyness of an option

Options can be classified into three categories, viz., in-the-money, at-the-money and out-of-the-money options.

In-the-money (ITM) option: This option would give the option holder a positive cash flow, if it were exercised immediately. A call option is said to be ITM, when spot price is higher than strike price. A put option is said to be ITM when spot price is lower than strike price. In our examples, the put option is in-the-money.

At-the-money (ATM) option: At-the-money option would lead to zero cash flow if it were exercised immediately. Therefore, for both call and put ATM options, strike price is equal to spot price. In reality, because the strike prices are at fixed intervals of say, Rs.5, Rs.10 or Rs.50, while the spot price moves in much smaller increments, the two prices may rarely be equal. Hence an ATM option can be defined as an option with a strike price which is closest to the spot price. For example, if the index is at 18415 and three options on the index with strike prices of 18350, 18400 and 18450 are available for trading, the option with the strike price of 18400 is an ATM option.

Out-of-the-money (OTM) option: An out-of-the-money option is one with a strike price worse than the spot price for the holder of option. In other words, this option would give the holder a negative cash flow if it were exercised immediately. A call option is said to be OTM, when spot price is lower than strike price. A put option is said to be OTM when spot price is higher than strike price. In our examples, the call option is out-of-the-money.

4.4 Intrinsic value and time value of an option

The option premium, defined above, consists of two components - intrinsic value and time value.

The intrinsic value of an option refers to the amount by which the option is in-the-money i.e., the amount an option buyer will realize, before adjusting for premium paid, if he exercises the option instantly. Therefore, only in-the-money options have intrinsic value whereas at-the-money and out-of-the-money options have zero intrinsic value. The intrinsic value of an option can never be negative because an option holder is not bound to exercise an option if such exercise will result in a loss to him.

For a call option which is in-the-money, the intrinsic value is the excess of spot price (S) over the exercise price (X). Thus, the intrinsic value of a call option can be calculated as S-X, with a minimum possible value of zero because no one would like to exercise his right under a disadvantageous condition. Similarly, the intrinsic value for an in-the-money put option is the excess of exercise price (X) over the spot price (S). Thus, the intrinsic value of put option can be calculated as X-S, with a minimum possible value of zero.

Note that the put option in the earlier example is in-the-money. If the holder of this option could exercise it immediately, it would fetch him a positive cashflow equal to the difference between the option strike price (18400) and the Nifty spot price (18315.10). Hence the intrinsic value of the put option is Rs.84.90. The call option in our earlier example is out-of-the-money, since the option strike price (18400) is higher than the spot price (18315.10). Hence the call option has an intrinsic value of zero.

Time value: It is the difference between the premium and intrinsic value, if any, of an option. ATM and OTM options have only time value because the intrinsic value of such

options is zero. In our example, the put option has a time value of Rs.92.70 which is the difference between the option premium (Rs.177.60) and the intrinsic value (Rs.84.90). In the case of the call option, the entire option premium of Rs.124.50 represents time value as the intrinsic value of the call is zero.

4.5 Payoff Charts for Options

Having gone through the basic terminology used in the options market, let us get to the payoff profile of various option positions.

Long option

Buyer of an option is said to be "long the option". As described above, he/she would have a right and no obligation with regard to buying/ selling the underlying asset in the contract. When you are long an equity option contract:

- You have the right to exercise that option.
- Your potential loss is limited to the premium amount you paid for buying the option.
- Profit would depend on the level of underlying asset price at the time of exercise/expiry of the contract.

Short option

Seller of an option is said to be "short the option". As described above, he/she would have an obligation but no right with regard to selling/buying the underlying asset in the contract. When you are short (i.e., the writer of) an equity option contract:

- Your maximum profit is the premium received.
- You can be assigned an exercised option any time during the life of option contract (in case of American options). All option writers should be aware that assignment is a distinct possibility.
- Your potential loss is theoretically unlimited as defined below.

Now, let us understand each of these positions in detail:

Long Call

Suppose that the stock index is quoted at 17562. You buy a near-month call option on the index with a strike price of 17500 at a premium of Rs.95. As you are aware, a call option gives the buyer the right, but not the obligation to buy the underlying at the strike price. So, in this example, you have the right to buy the index at 17500 on the expiration date of the call option. You may or may not buy as there is no compulsion to exercise the option. If the index closes above 17500 at expiry, you will exercise the option, else you will let it expire worthless. If the index closes at 17400, you will NOT exercise the right to buy the underlying, as the index can be bought at a market price lower than your strike price. Why will you buy something at 17500 when you can have the same thing at 17400?

So, you will forego the right. In such a situation, your loss will be equal to the premium you had paid, which in this case is Rs.95. Of course, since the underlying asset in this example is a stock index and not a single stock, it may be difficult or cumbersome to buy or sell it on the expiration date. Hence, long positions in index options are permitted to be 'cash-settled' on the expiration date. In other words, if the long call position on the index is in-the-money on the expiration date, the call holder receives the difference between the option strike price and the closing spot value of the index on the expiration date.

Let us try to find out using payoff charts what your maximum profits / losses will be at expiry at different closing levels of the index.

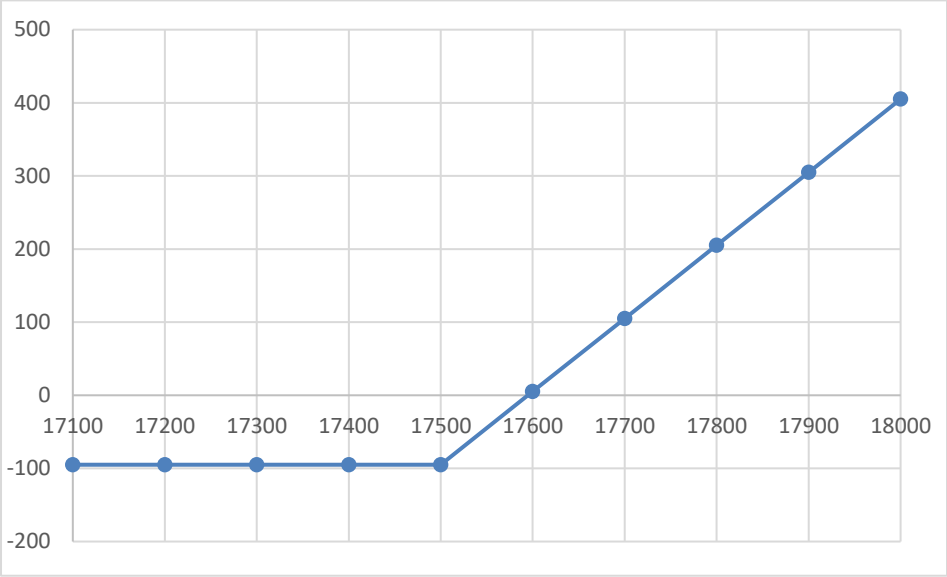
If the index were to close at 17595, the option will expire in-the-money. Since ITM index options are cash-settled on the expiration date, you will receive a payoff of Rs.95 when you exercise the option. This payoff is simply the difference between the spot value of the index on the expiration date (which is the closing price of the index on that day) and the strike price of the call option. In this transaction you will make a profit of Rs.95, but you have already paid an equal amount to the option seller right at the beginning, when you bought the option (as option premium), making your net gain equal to zero. Hence, 17595 is the Break-Even Point (BEP) for this option contract. A general formula for calculating BEP for call options is strike price plus premium (X + P).

If the index were to close at 18000, the call is again ITM. You will exercise the option and will receive a payoff of Rs.500 which is the difference between the spot closing price of the index on the expiration date and the strike price of the option. But since you have already paid Rs. 95 as option premium, your actual profit would be Rs 500 – Rs 95 = Rs 405.

The payoff table given below shows the profit on the long call position for different levels of the index on the expiration date. This table is used to draw the payoff chart given in the next page.

Strike price	**17500**		
Premium	**95**		
Index value at expiry	**Premium paid (A)**	**Payoff on expiry (B)**	**Profit on expiry (A)+(B)**
17100	-95	0	-95
17200	-95	0	-95
17300	-95	0	-95
17400	-95	0	-95
17500	-95	0	-95
17600	-95	100	5

17700	-95	200	105
17800	-95	300	205
17900	-95	400	305
18000	-95	500	405



The chart above shows some of the possible closing levels of the index on the expiration date on the X-axis. The Y-axis shows the net profit on the long call position at various closing levels of Nifty on the expiration date.

The contract value for an index option with lot size of 50 and strike price of 17500 is 17500 * 50 = Rs 8,75,000. The maximum loss for such an option buyer would be equal to Rs 95 * 50 = Rs 4,750.

When the index closes above 17595, you start making profit on exercising the option and if it stays below 17595, you as a buyer always have the freedom not to exercise the option. But as seen from table and chart, you can reduce your losses as soon as the index rises above 17500. A long call position helps you to limit your loss to a maximum of Rs. 4750 with potentially unlimited profit.

As a call option buyer, you need not pay any margin to the Exchange because your payment obligation is restricted to the option premium that you have already paid at the time of buying the call. You will not be subject to any further loss on your long call position and hence the Exchange does not require any margin payment from you.

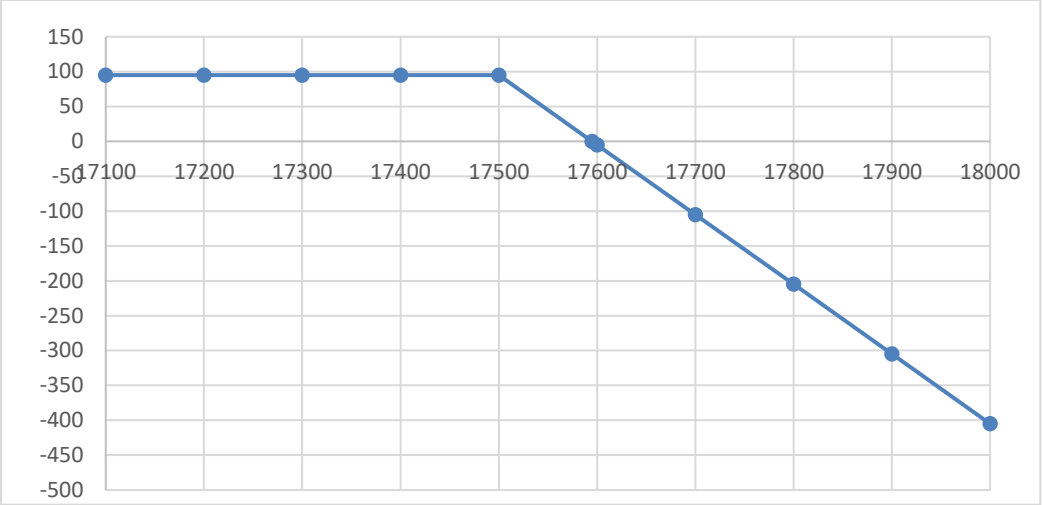
Short Call

Whenever someone buys a call option, there has to be a counterparty, who has sold that call option. If the maximum loss for a long call position is equal to the premium paid, it automatically means that the maximum gain for the short call position will be equal to

the premium received. Similarly, if maximum gain for long call position is unlimited, then the maximum loss for the short call position must be unlimited. Lastly, whenever, the long call position makes losses, the short call position will be profitable and vice versa. Hence, if we have understood long call payoff, short call payoff chart will be just a mirror image of the long call payoff. Thus, when the index is at 17000, the long call position makes a loss of Rs. 95 and the short call position makes a profit of Rs. 95. Similarly when the index closes at 17700, while the long call makes a profit of Rs.105, the short call position will lose Rs.105. As the index starts rising, the short call position will go deeper into losses.

Strike price	**17500**		
Premium	**95**		
Index value at expiry	**Premium received (A)**	**Payoff on expiry (B)**	**Profit on expiry (A)+(B)**
17100	95	0	95
17200	95	0	95
17300	95	0	95
17400	95	0	95
17500	95	0	95
17600	95	-100	-5
17700	95	-200	-105
17800	95	-300	-205
17900	95	-400	-305
18000	95	-500	-405

The payoff chart for a short call position is shown below. Maximum gain for an option seller, as explained earlier, will be equal to the premium received (as long as the index stays below strike price) whereas maximum loss can be unlimited (when the index starts rising above BEP). BEP for a short call position will also be equal to X + P. BEP is independent of position (long or short), it is instrument specific (call option).



The X-axis of the chart above shows the different possible closing levels of the index on the expiration date while the Y-axis shows the net profit on the short call position corresponding to each closing level of the index.

The contract value for an index option with lot size of 50 and strike price of 17500 is 17500 * 50 = Rs 8,75,000. The chart shows that the gain of the call seller is limited to Rs.95, which is the premium received initially for selling the option. The call seller's losses become larger and larger for higher closing values of the index on the expiration date. Thus, the short call position has limited gains in the form of premium received, while the losses are potentially unlimited. Although the call seller receives a premium initially for selling the option, he must pay a margin to the Exchange on the short position. This is because the option seller has an obligation and since his losses can be unlimited, he can be a potential risk for the stability of the system.

Long Put

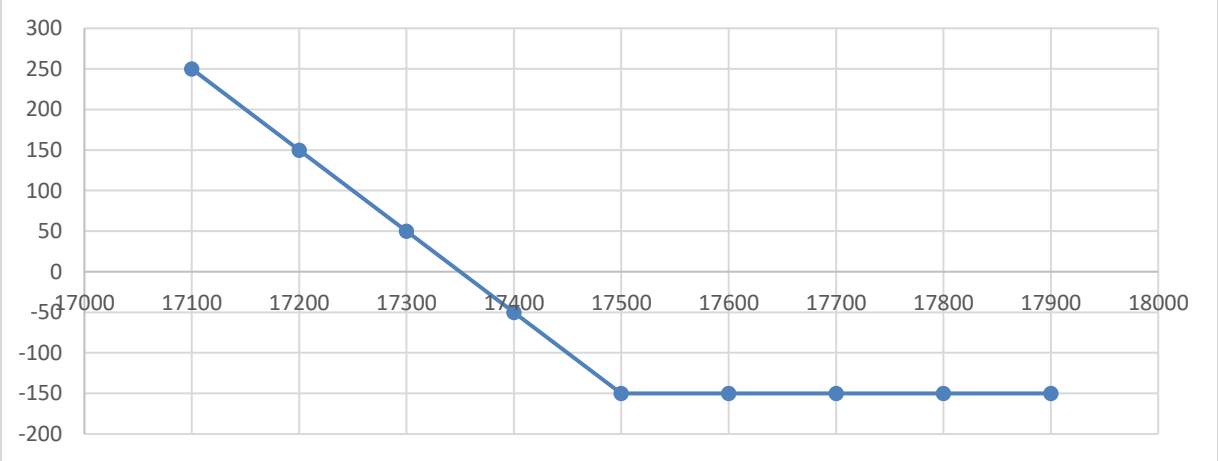
Suppose you buy a near-month put option with a strike price of 17500 at a premium of Rs 150. A put option gives the buyer of the option the right, but not the obligation, to sell the underlying at the strike price. In this example, you hold the right to sell the index at 17500. When will you do so? You will do so only when the index is at a level lower than the strike price. So, if the index falls below 17500 at expiry, you will buy the index from the market at the lower price and sell at your strike price. If the index stays above 17500, you will let the option expire worthless. The maximum loss in this case as well (like in long call position) will be equal to the premium already paid i.e., Rs 150. As discussed in the earlier section, the final settlement of all long positions in index options on the expiration date is in cash and not by physical delivery. Hence, if the long put is in-the-money on expiry, the put holder will receive the difference between the put strike price and the closing value of the index on the expiration date.

What can be the maximum profit? Theoretically, the index can fall only till zero. So, the maximum profit will be achieved when the index closes at zero on the expiration date! The profit in this case will be Rs 17500, but since you have already paid Rs 150 as premium, your net profit will be Rs 17350, which is 17500-150.

The breakeven point in this case will be equal to strike price – premium (X – P). In our example, the breakeven point will be equal to 17350. Thus, when the index starts falling below17350, you will start making profits.

The payoff chart for long put position is drawn using the table below:

Strike price	**17500**		
Premium	**150**		
Index value at expiry	**Premium paid (A)**	**Payoff on expiry (B)**	**Profit on expiry (A)+(B)**
17100	-150	400	250
17200	-150	300	150
17300	-150	200	50
17400	-150	100	-50
17500	-150	0	-150
17600	-150	0	-150
17700	-150	0	-150
17800	-150	0	-150
17900	-150	0	-150



The X-axis of the chart above shows the different possible closing levels of the index on the expiration date while the Y-axis shows the net profit on the long-put position corresponding to each closing level of the index.

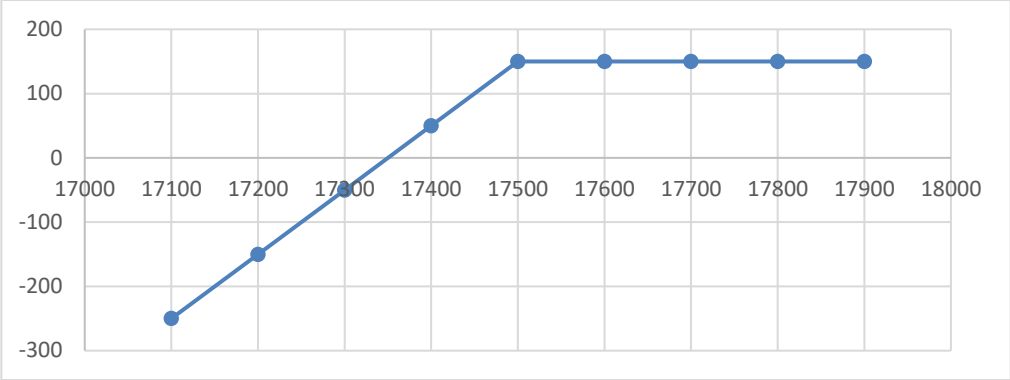
The maximum loss for the option buyer is the premium paid, which is equal to 150 * 50 = Rs 7,500, where 50 is the lot size. Contract value for this put option is 17500 * 50 = Rs 8,75,000. As the chart shows, the put buyer's maximum loss is Rs 150. Losses start reducing as the index dips below 17500 and the put buyer starts making profits when the index falls below 17350.

Just like the call option buyer, a put option buyer too need not pay any margin. This is because he has already paid the premium and there is no more risk that he can cause to the system. A margin is paid only if there is any obligation. An option buyer (either buyer of a call option or a put option) has no obligation.

Short Put

What will be the position of a put option seller/writer? Just the opposite of that of the put option buyer. When long put makes profit, short put will make loss. If maximum loss for long put is the premium paid, then maximum profit for the short put has to be equal to the premium received. If maximum profit for long put is when price of underlying falls to zero at expiry, then that also will be the time when short put position makes maximum loss. The table below shows the profit/ loss for short put position. The payoff chart is drawn using this table.

Strike price	**17500**		
Premium	**150**		
Index value at expiry	**Premium received (A)**	**Payoff on expiry (B)**	**Profit on expiry (A) + (B)**
17100	150	-400	-250
17200	150	-300	-150
17300	150	-200	-50
17400	150	-100	50
17500	150	0	150
17600	150	0	150
17700	150	0	150
17800	150	0	150
17900	150	0	150



The X-axis of the chart above shows the different possible closing levels of the index on the expiration date while the Y-axis shows the net profit on the short put position corresponding to each closing level of the index.

Contract value in this case will be equal to 17500 * 50 = Rs 8,75,000 and premium received will be equal to Rs 150 * 50 = Rs 7,500.

The chart above shows that the gain of the put seller is fixed at Rs 150, the premium received initially. However, the short put position starts making losses as the index dips below 17350, which is the break-even point. The seller of the put option receives the premium but he is required to pay a margin on his position as he has an obligation to deliver the underlying asset and his losses can be huge.

Risk and return profile of option contracts

A long option position has limited risk (premium paid) and unlimited profit potential. A short option position has unlimited downside risk, but limited upside potential (to the extent of premium received).

	Risk	Return
Long	Premium paid	Unlimited
Short	Unlimited	Premium received

4.6 Distinction between futures and options contracts

As can be seen from the examples above, options are products with asymmetric risk exposure i.e., the gains when the underlying asset moves in one direction are significantly different from the losses when the underlying asset moves in the opposite direction. For example, the loss incurred by the buyer of a call option on a stock is limited to the purchase price of the option, when the stock price declines. But if the stock price rises, the buyer of the call gains in proportion to the rise in the stock's value, thereby resulting in an asymmetric payoff. In contrast to this, futures have symmetric risk exposures (symmetric payoff).

Leverage

An option buyer pays a relatively small premium for market exposure in relation to the contract value. This is known as leverage. In our examples above (long call and long put), we have seen that the premium paid (i.e., Rs 4750 for long call and Rs 7500 for long put) was only a small percentage of the contract value (Rs 875000 in both cases). Due to this leverage, a trader can see large percentage gains from comparatively small, favourable percentage moves in the underlying equity.

Leverage also has downside implications. If the underlying price does not rise/fall as anticipated during the lifetime of the option, leverage can magnify the trader's percentage loss. Though options offer their owners a predetermined level of risk, if those options expire with no value, the entire amount of the premium paid for those options is lost.

Futures and options contracts are both used for trading, hedging and arbitrage. The main points of difference between these two contracts in terms of rights and obligations of the counterparties can be summarized as follows:

Futures contracts	**Option contracts**
The buyer and seller both have the obligation to buy or sell the underlying asset.	The option buyer has the right to buy or sell the underlying asset without any obligation to do so; the option seller has the obligation to buy or sell the underlying asset, if the option buyer exercises his option.
The buyer and seller are required to pay initial margin as decided by exchanges for entering into futures contract.	The option buyer is required to pay to the option seller a price known as option premium for buying the option while the option seller needs to deposit initial margin with exchanges at the time of selling an option.
Both buyer and seller can make unlimited gains or losses.	The option buyer can make potentially unlimited gains, but his loss is limited to the premium already paid; the option seller can face unlimited losses, but his gain is limited to the premium already received.
Both buyer and seller are subject to payment / receipt of margins (MTM) on daily basis.	Only the option seller is subject to MTM margins on daily basis.

4.7 Basics of Option Pricing and Option Greeks

Option pricing fundamentals

In our above examples, we have seen that call option premium is Rs. 95 and put option premium is Rs. 150. The question is: from where did we get these values? On what basis did market participants arrive at these values of the premiums? What are the parameters that affect these values? Are these fixed by the stock exchanges or by SEBI?

The answer lies in understanding what affects options. Prices are never fixed by stock exchanges or SEBI or anybody for that matter. In fact, price discovery is a very critical and basic component of markets. Stock exchanges only provide a platform where buyers and sellers meet, and SEBI's role is to ensure smooth functioning of our markets.

Any option's value increases or decreases depending upon different variables. Each variable has its impact on an option. The impact can be the same or different for a call and a put option.

As explained in the earlier section, the option premium is the sum of intrinsic value and time value. If the option has not expired, it will always have some time value. The option may or may not have any intrinsic value depending upon whether it is ITM, ATM or OTM.

Time value of the option in turn depends upon how much time is remaining for the option to expire and how volatile is the underlying.

Thus, there are five fundamental parameters on which the option price depends upon:

1) Spot price of the underlying asset
2) Strike price of the option
3) Volatility of the underlying asset's price
4) Time to expiration
5) Interest rates

These factors affect the premium/ price of options (both American & European) in several ways.

Spot price of the underlying asset

The option premium is affected by the price movements in the underlying instrument. If price of the underlying asset goes up, the value of the call option increases, while the value of the put option decreases. Thus, when the underlying index rises from 17500 to 18000, the price of a call option with a strike price of 17500 will increase, while the price of a put option with the same strike price will fall. Similarly, if the price of the underlying asset falls, the value of the call option decreases while the value of the put option increases.

Strike Price

If all the other factors remain constant but the strike price of option increases, intrinsic value of the call option will decrease and hence its value will also decrease. For example, when the underlying index is at 17562, a call option with a strike price of 17600 will trade at a higher price than a call option with the same maturity but with a strike price of 17700. This is because the intrinsic value is progressively lower for higher strike prices of calls. On the other hand, with all the other factors remaining constant, increase in strike price of option increases the intrinsic value of the put option which in turn increases its option value. Thus, a put option with a strike price of 17700 will trade at a higher premium than a put option with the same maturity but a strike price of 17600.

Volatility

It is the magnitude of movement in the underlying asset's price, either up or down. It affects both call and put options in the same way. Higher the volatility of the underlying stock or index, higher the premium because there is a greater possibility that the option will move in-the-money during the life of the contract. Hence, when the index or stock volatility shoots up because of some unexpected event, the prices of both calls and puts on the index or stock will increase.

Higher volatility = Higher premium, Lower volatility = Lower premium (for both call and put options).

Time to expiration

The effect of time to expiration on both call and put options is similar to that of volatility on option premiums. Generally, longer the maturity of the option, greater is the uncertainty and hence the higher is the premium. Thus, an index option with a strike price of 17500 and maturing in three months will generally trade at a higher price than an option with the same strike price but expiring in one month. If all other factors affecting an option's price remain the same, the time value portion of an option's premium will decrease with the passage of time. This is also known as time decay. Options are known as 'wasting assets', due to this property where the time value gradually falls to zero.

It is also interesting to note that of the two component of option pricing (time value and intrinsic value), one component (the time Value) is inherently biased towards reducing in value. So, if all things remain constant throughout the contract period, the option price will always fall in price by expiry. Thus, option sellers are at a fundamental advantage as compared to option buyers as there is an inherent tendency in the price to go down.

Interest Rates

Interest rates are slightly complicated because they affect different options, differently. For example, interest rates have a greater impact on options with individual stocks and indices compared to options on futures. To put it in a simpler way, high interest rates will

result in an increase in the value of a call option and a decrease in the value of a put option.

Option Greeks

Option premiums change with changes in the factors that determine option pricing i.e., factors such as strike price, volatility, term to maturity, etc. The sensitivities most commonly tracked in the market are known collectively as "Greeks" represented by Delta, Gamma, Theta, Vega and Rho.

Delta (δ or Δ)

The most important of the 'Greeks' is the option's "Delta". This measures the sensitivity of the option value to a given small change in the price of the underlying asset. It may also be seen as the speed with which an option moves with respect to price of the underlying asset.

Delta = Change in option premium/ Unit change in price of the underlying asset.

Delta for call option buyer is positive. This means that the value of the contract increases as the underlying price rises. To that extent it is rather like a long or 'bull' position in the underlying asset. Delta for call option seller will be same in magnitude but with the opposite sign (negative).

Delta for put option buyer is negative. The value of the contract increases as the underlying price falls. This is similar to a short or 'bear' position in the underlying asset. Delta for put option seller will be same in magnitude but with the opposite sign (positive).

Therefore, delta is the degree to which an option price will move given a small change in the underlying stock or index price, all else being equal. For example, if the delta of a call option is 0.60, it means that a small change of, say 1 rupee, in the price of the underlying asset, will lead to a change of 60 paise in the price of the call option.

The knowledge of delta is of vital importance for option traders because this parameter is heavily used in margining and risk management strategies. The delta is often called the hedge ratio. For example, if you have a portfolio of 'n' shares of a stock then 'n' divided by the delta gives you the number of calls you would need to be short (i.e., the number of calls you need to write) to create a hedge. In such a "delta neutral" portfolio, any gain in the value of the shares held due to a rise in the share price would be exactly offset by a loss on the value of the calls written, and vice versa.

Gamma (γ)

Gamma measures change in delta with respect to change in price of the underlying asset. This is called a second derivative of the option price with regard to price of the underlying asset. It is calculated as the ratio of change in delta for a unit change in market price of the underlying asset.

Gamma = Change in an option delta / Unit change in price of underlying asset

Gamma works as an acceleration of the delta, i.e. it signifies the speed with which an option will go either in-the-money or out-of-the-money due to a change in price of the underlying asset. For instance, if a call option has a delta of 0.50 and a gamma of 0.08, it means that a small increase of say, 1 rupee, in the price of the stock will cause the option delta to change by 0.08. Thus, the new call delta will be 0.58.

Theta (θ)

Theta is the measure of an option's sensitivity to time decay. Theta is the change in option price given a one-day decrease in time to expiration. It is a measure of time decay. Theta is generally used to gain an idea of how time decay is affecting your option positions.

Theta = Change in an option premium / Change in time to expiry

For example, if a call option with 5 days to expiry has a theta of 1.2, it means that the option price will decline by Rs.1.20 for each day till the option expiry. Usually, theta is negative for a long option, whether it is a call or a put. Other things being equal, options tend to lose time value each day throughout their life.

Vega (ν)

Vega is the measure of the sensitivity of an option price to changes in market volatility. It is the change of an option premium for a given change (typically 1%) in the underlying volatility.

Vega = Change in an option premium / Change in volatility

Thus, if a call option has a vega of 0.80, it means that the option premium will change by 0.80 per cent for every 1 per cent change in the implied volatility of the underlying asset.

Vega is positive for a long call and a long put. An increase in the assumed volatility of the underlying increases the expected reward from a long option position, whether the option is a call or a put.

Rho (ρ)

Rho is the change in option price given a one percentage point change in the risk-free interest rate. Rho measures the change in an option's price per unit increase in the cost of funding the underlying.

Rho = Change in an option premium / Change in cost of funding the underlying

4.8 Option Pricing Models

There are various option pricing models which traders use to arrive at the right value of the option. Some of the most popular models are briefly discussed below:

The Binomial Pricing Model

The binomial option pricing model was developed by William Sharpe in 1978. It has proved over time to be the most flexible, intuitive and popular approach to option pricing.

The binomial model represents the price evolution of the option's underlying asset as the binomial tree of all possible prices at equally-spaced time steps from today under the assumption that at each step, the price can only move up and down at fixed rates and with respective simulated probabilities.

This is a very accurate model as it is iterative, but its implementation is complex and time consuming.

The Black & Scholes Model

The Black & Scholes model was published in 1973 by Fisher Black and Myron Scholes. It is one of the most popular, relatively simple and fast modes of calculation. Unlike the binomial model, it does not rely on calculation by iteration.

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

Call option price can be calculated as: $C = SN(d_1) - Xe^{-rt} N(d_2)$

And

Put option price can be calculated as: $P = Xe^{-rt} N(-d2) - SN(-d1)$

Where,

$D_1=[In(S/X)+(r+v^2/2)t]/ v\sqrt{t}$

$D_2 = d1-v\sqrt{t}$

And the variables are

- S = stock price
- X = strike price
- t = time remaining until expiration, expressed in years
- r = current continuously compounded risk-free interest rate
- v = annual volatility of stock price (the standard deviation of the short-term returns over one year)
- In = natural logarithm
- N(x) = standard normal cumulative distribution function
- e = the exponential function

4.9 Implied volatility of an option

As seen in the earlier section, the volatility of the underlying asset is one of the most important factors affecting the price of the option. But volatility is invisible. So how do we measure it? One way of measuring volatility is by measuring the percentage price changes

in the underlying asset over a historical period. For instance, we can take the weekly percentage changes in Nifty over the past one year and compute the standard deviation of these weekly price changes. This will tell us how volatile Nifty was over the past year. This measure of volatility is known as 'historical volatility'. But option traders do not use just the historical volatility of a stock to compute the price of an option on that stock.

Market participants are more interested in finding out how volatile the stock is expected to be over the remaining life of the option. For example, a pharmaceutical company's stock price has been range-bound over the past one year and its historical volatility has been around 15 per cent. However, suppose that the company is fighting an important court case and the verdict is expected to be announced in the next week. A favourable outcome of the court case is expected to boost the sales and profits of the company's most important product, while an unfavourable verdict will lead to huge losses. In such a case, the expected volatility of the stock over the next week will probably be much higher than its historical volatility; it could be as high as 70 or 80 per cent! So, how do we understand what this 'expected volatility' is for a given stock or index?

Option traders calculate this expected volatility by running the Black-Scholes model in the reverse order. For example, suppose we know that when the index is at 17562, a call option with a strike price of 17500 and 9 days to expiration is trading at Rs.95. We also know that the interest rate currently is 6 per cent. Since we have all the data we need except the underlying volatility, we can simply plug all this data into the Black-Scholes model and calculate what the volatility should be in order to get an option price of Rs.95. This type of underlying volatility is known as the 'implied volatility' of the asset. It is different from the historical volatility of the asset because it is worked out from the option price rather than the historical price movement of the asset itself.

So, how does calculating implied volatility help you as an option trader? Simply put, option traders use the implied volatility to understand whether it is the right price to buy or sell an option. Usually, when the implied volatility is high, option traders start selling options. When implied volatility is low, traders like to buy options. In the example of the pharmaceutical company mentioned above, suppose that the implied volatility is around 80 per cent just a day before the court verdict is to be announced. This is much higher than the historical volatility of the stock, which was 15 per cent. So, option traders would like to sell options on the stock just before the announcement of the verdict. This is because a high implied volatility means that the option price itself is very high. However, conscious about the fact that they are at the receiving end of the asymmetric nature of options pay offs, the option writers tend to extract higher premiums from the option buyers, which works as a margin of safety for them.

In the above example of pharma company, if the put option writers had already factored in the impact of adverse verdict on the stock price while writing those options, then even an adverse verdict may not really lead to losses for the writers (as they already collected high premium by factoring in such an eventuality). Similarly, even if the stock rises sharply on the back of a favourable court verdict, the call writers may not incur huge losses, had they factored that possibility in their options pricing and sold those options at higher premiums. Remember that an implied volatility of 70-80 per cent just before the day of the court verdict means that option premia would be high.

4.10 Analysis of options from the perspectives of buyer and seller

An important decision that a trader needs to make is which option he should trade: in-the-money, at-the-money or out-of-the-money. Among other things, a trader must also consider the premium of these three options in order to make an educated decision. As discussed earlier, there are two components in the option premium – intrinsic value and time value. If the option is deeply in-the-money, the intrinsic value will be higher and so is the option value/premium. In case of at-the-money or out-of-the-money options, there is no intrinsic value but only time value. Hence, these options remain cheaper compared to in-the-money options. Therefore, option buyer pays higher premium for an in-the-money option, compared to an at-the-money or out-of-the-money option.

For ATM options, the uncertainty is highest as compared to ITM or OTM options. This is because we know that when an option is ITM or OTM, even if the price moves somewhat, in either direction, the option will still largely remain ITM or OTM as the case may be. But in case of ATM options, even a small price movement in either direction can tip the option from ATM to ITM or OTM. There is a huge uncertainty here and this uncertainty is a function of the time to expiry and the volatility of the underlying, both of which are captured in the time value.

Analysis of Call Option Trading from Buyer's Perspective

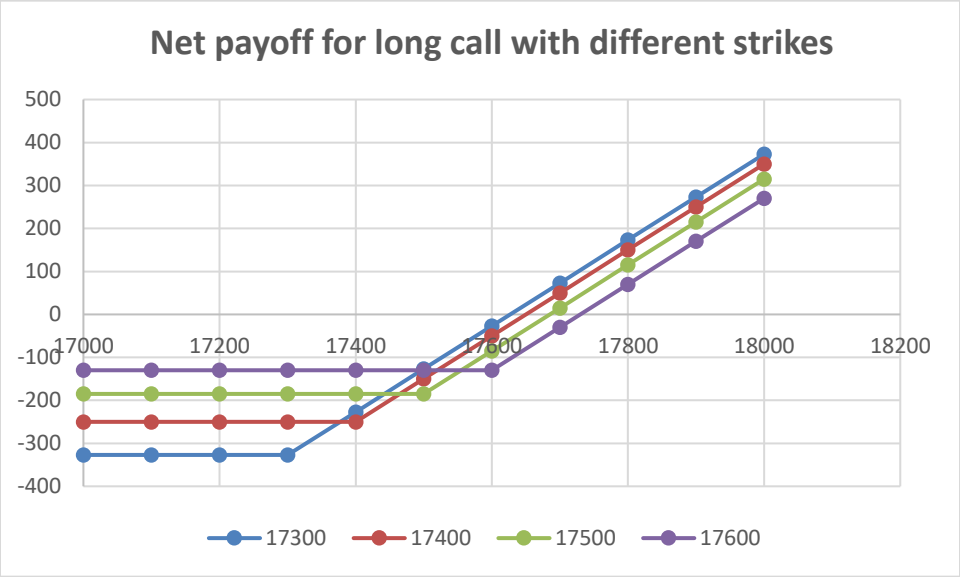
Suppose that the index is at 17562. Let us consider call options with strike prices of 17300, 17400, 17500 and 17600. A call option buyer will buy the option and pay the premium upfront. Premiums for various strike prices are as follows:

Strike Price	Premium
17300	327
17400	250
17500	185
17600	130

The 17300 strike call option is deep in-the-money and has an intrinsic value of 17562 – 17300 = 262. Hence the option premium will be at least equal to this value. The remaining portion of the premium (i.e., 327 - 262 = 65) is the time value.

The 17600 strike call option is an out-of-the money option. There is no intrinsic value here. The entire option premium is attributed to risk associated with time, i.e. time value.

Strike price	**17300**	**17400**	**17500**	**17600**
Premium	327	250	185	130
BEP	17627	17650	17685	17730
Index closing value on expiry	**Profit on expiration date**			
17000	-327	-250	-185	-130
17100	-327	-250	-185	-130
17200	-327	-250	-185	-130
17300	-327	-250	-185	-130
17400	-227	-250	-185	-130
17500	-127	-150	-185	-130
17600	-27	-50	-85	-130
17700	73	50	15	-30
17800	173	150	115	70
17900	273	250	215	170
18000	373	350	315	270



If the index closes below 17300 at expiry, all options will expire out of the money i.e., they are worthless. The greatest loss will be for the option with strike price 17300 (whose premium was Rs 327) and the least loss will be incurred on strike 17600 option (whose premium was Rs 130).

Profitability for call options

As seen above, when an option buyer is bullish on the index, he can buy call options with any strike price. The choice of the option would be better understood with return on investment (ROI). In each case, ROI is defined as net profit as a percentage of premium paid by the option buyer.

To illustrate, if the index rises to 17800 at maturity, then ROI for all the four options will be as below:

Profit on strike price 17300 option = 17800 – 17300 – 327 = 173
Return on investment = 173/327 = 53%

Profit on strike price 17400 option = 17800 -17400 -250 = 150
Return on investment = 150/250 = 60%

Profit on strike price 17500 option = 17800 – 17500 -185 = 115
Return on investment = 115/185 = 62%

Profit on strike price 17600 option = 17800 – 17600 – 130 = 70
Return on investment = 70/130 = 54%

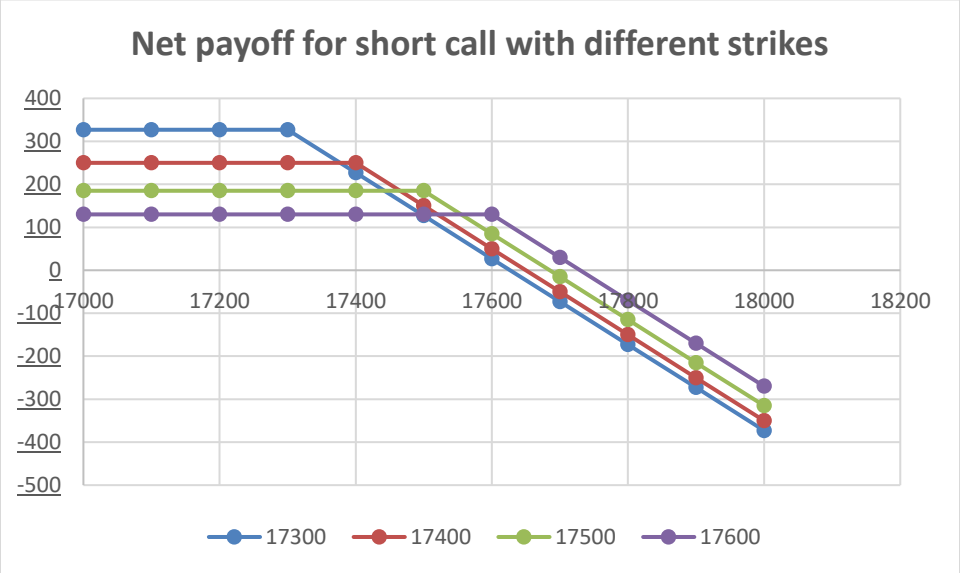
Analysis of Call Option Trading from Seller's Perspective

A call option seller has a neutral to bearish perspective regarding the underlying price.

Strike price	**17300**	**17400**	**17500**	**17600**
Premium	327	250	185	130
BEP	17627	17650	17685	17730
Index closing value on expiry	**Profit on expiration date**			
17000	327	250	185	130
17100	327	250	185	130
17200	327	250	185	130
17300	327	250	185	130
17400	227	250	185	130
17500	127	150	185	130
17600	27	50	85	130
17700	-73	-50	-15	30

17800	-173	-150	-115	-70
17900	-273	-250	-215	-170
18000	-373	-350	-315	-270

The table above shows the net gain for a seller of call options with different strike prices at different spot values of the index on the expiry date. As can be seen, the seller makes a fixed amount of gain, equal to the option premium received by him, when the index closes below the strike price on expiry. The seller's gain goes on reducing and he starts making losses when the index closes at higher levels on expiry date.



Analysis of Put Option Trading from a Buyers' Perspective

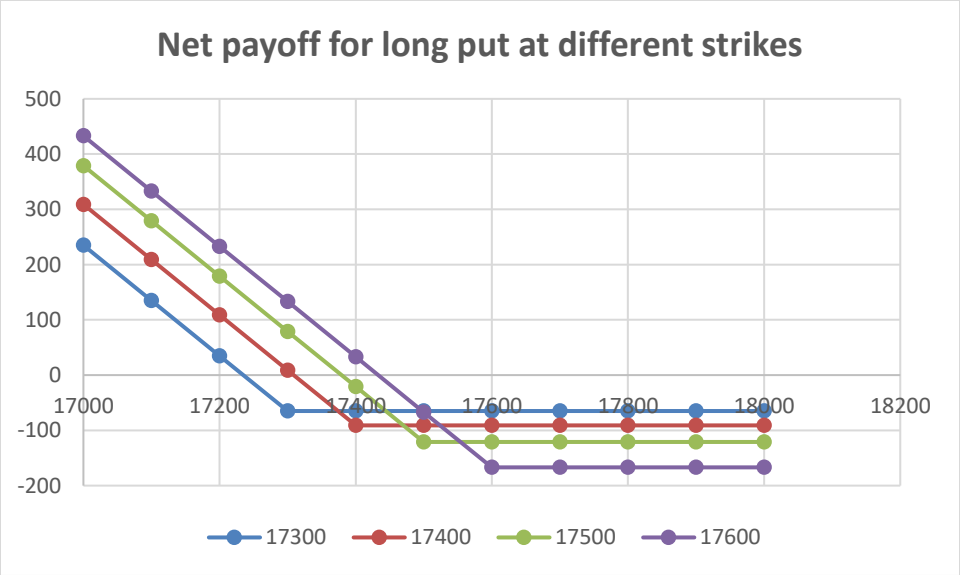
Suppose that the underlying index is at 17562. A person bearish on the index can buy a put option of any strike available. Let us consider put options of strike prices 17300, 17400, 17500 and 17600. The premiums for each of these are given below:

Strike Price	Premium
17300	65
17400	91
17500	121
17600	167

The 17600 strike put option is ITM whereas the 17300 strike put option is OTM. In case of the 17600 strike option, the intrinsic value is 17600 - 17562 = 38 and 167 – 38 = 129 is the time value. For the other options, the entire premium is the time value.

Strike price	17300	17400	17500	17600
Premium	65	91	121	167
BEP	17235	17309	17379	17433
Index closing value on expiry	Profit on expiration date			
17000	235	309	379	433
17100	135	209	279	333
17200	35	109	179	233
17300	-65	9	79	133
17400	-65	-91	-21	33
17500	-65	-91	-121	-67
17600	-65	-91	-121	-167
17700	-65	-91	-121	-167
17800	-65	-91	-121	-167
17900	-65	-91	-121	-167
18000	-65	-91	-121	-167

The table above shows the net gains of a buyer of put options at different strike prices, when the index expires at different levels on the expiry date.



The strike price of 17600 is in-the-money and hence the sellers are charging a higher premium of Rs. 167 for it. Similarly strike price 17300 is out-of-the-money and hence the contract is selling at low premium of Rs. 65.

In terms of return on investment criterion, generally the buyer of deep OTM put option will get a higher return on his/her investment, if price of the index falls drastically.

To illustrate if the index falls to 17000 at maturity then ROI for all the options will be as below:

Profit on strike price 17300 option = 17300 -17000 - 65 = 235
Return on investment = 235/65 = 362%

Profit on strike price 17400 option = 17400 – 17000 – 91 = 309
Return on investment = 309/91 = 340%

Profit on strike price 17500 option = 17500 – 17000 – 121 = 379
Return on investment = 379/121 = 313%

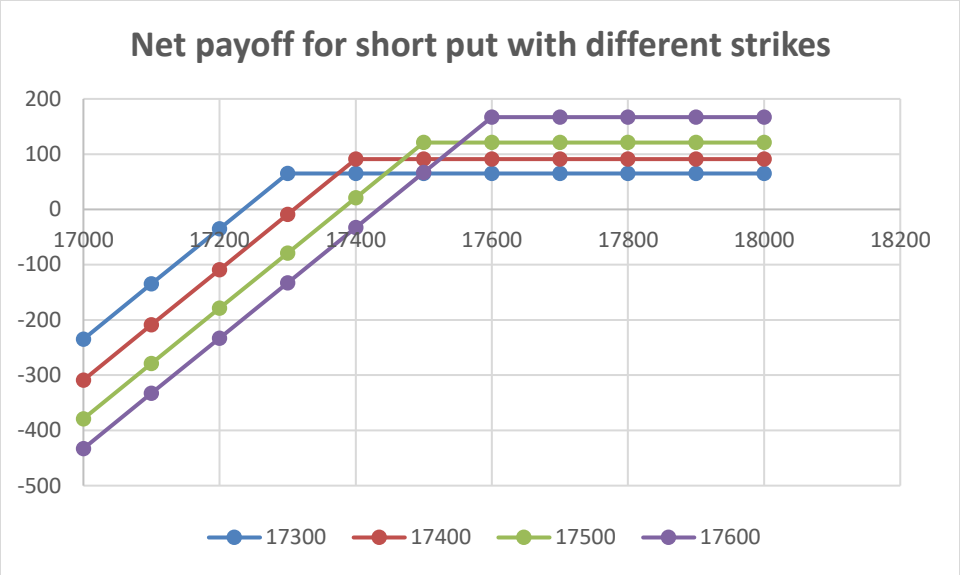
Profit on strike price 17600 option = 17600-17000-167 = 433
Return on investment = 433/167 = 259%

Seller of put option

A put option seller has a neutral to bullish perspective regarding the underlying price.

Strike price	**17300**	**17400**	**17500**	**17600**
Premium	65	91	121	167
BEP	17235	17309	17379	17433
Index closing value on expiry	**Profit on expiration date**			
17000	-235	-309	-379	-433
17100	-135	-209	-279	-333
17200	-35	-109	-179	-233
17300	65	-9	-79	-133
17400	65	91	21	-33
17500	65	91	121	67
17600	65	91	121	167
17700	65	91	121	167
17800	65	91	121	167
17900	65	91	121	167
18000	65	91	121	167

The table above shows the net gains to a seller of put options at different strike prices at different closing levels of the index on the expiry date.



As per the table and charts, the seller of put option incurs higher risk in selling deep ITM put options even though they fetch higher returns in terms of option premiums. On the other hand, selling deep OTM put options is less risky but they come with lower premium.

Summary

From a trader's perspective, we may say that he has the choice of futures of various expiries and also options of various expiries and various strikes. Depending upon his analysis of the then existing market conditions and his risk appetite, he can devise various strategies, which we will see in the next chapter.

Sample questions

1. The buyer of an option cannot lose more than the option premium paid.
(a) True only for European options
(b) True only for American options
(c) **True for all options**
(d) False for all options

2. You sold a Put option on a share. The strike price of the put was Rs. 245 and you received a premium of Rs 49 from the option buyer. Theoretically, what can be the maximum loss on this position?
(a) **196**
(b) 206
(c) 0
(d) 49

3. Current Price of XYZ Stock is Rs 286. Rs. 260 strike call is quoted at Rs 45. What is the Intrinsic Value?
(a) 19
(b) **26**
(c) 45
(d) 0

4. A European call option gives the buyer the right but not the obligation to buy from the seller an underlying at the prevailing market price "on or before" the expiry date.
(a) True
(b) **False**

5. An in-the-money option is _____.
(a) An option with a negative intrinsic value
(b) An option which cannot be profitably exercised by the holder immediately
(c) **An option with a positive intrinsic value**
(d) An option with zero-time value

CHAPTER 5: STRATEGIES USING EQUITY FUTURES AND EQUITY OPTIONS

LEARNING OBJECTIVES:

After studying this chapter, you should know various hedging, arbitrage and trading strategies using equity futures and options:

- Hedging using futures contracts
- Using futures contracts for trading
- Cash-carry and Reverse cash-and-carry arbitrage using futures
- Calendar spreads using futures
- Spread strategies using options
- Straddles and Strangles
- Collar and Butterfly Spread
- Covered calls and Protective Puts
- Arbitrage using options
- Delta-hedging using options
- Interpreting Open Interest and Put-Call ratio

In the earlier chapters we have studied the features, contract specifications and payoff profiles of long and short positions in futures and options. Having understood the risk/ return profiles of both futures and options, now we turn to the application of these instruments for hedging, trading and arbitrage. First, we will understand how futures contracts can be used for hedging, trading and arbitrage. Next, we will examine different trading strategies using options. We will also understand arbitrage using options based on the principle of put-call parity. Lastly, we will consider the process of delta-hedging an options portfolio.

5.1 Futures contracts for hedging, speculation and arbitrage

Derivative instruments such as futures and options were primarily created for managing risk. In Unit 3 we saw how stock and index futures contracts can be used for mitigating the risk of a single stock or a portfolio of stocks. We saw that an investor may take a 'long hedge' or a 'short hedge' using futures. Let us look at specific examples in this chapter.

Long hedge using stock futures:

A long hedge using stock futures is taken to hedge the price risk of a planned future purchase of a stock. Consider that you want to buy 1500 shares of ABC Ltd. The shares are traded at Rs.455 today, i.e. May 10, 20XX. However, you do not have the required funds today. One of your bank deposits will mature on June 20, 20XX and you plan to use those funds to buy the shares only on that date. What is the risk that you are exposed to if you postpone your purchase till 20th June?

The risk is that if you do not purchase the shares today, the share price may increase rapidly by 20th June. To hedge this price risk, you can take a long position in a futures contract on ABC Ltd shares today. Suppose that the futures contract expiring on June 29, 20XX is traded at Rs.457.30. The lot size of the contract is 1500. Since you are planning to buy 1500 shares, you will take a long position (one lot) in the futures contract expiring in June.

Now suppose that on 20th June you are able to purchase the 1500 shares in the spot market. The share price could have increased or declined till 20th June. Let us look at both these scenarios:

Suppose that the stock price has increased to Rs.520. Your total outlay on the purchase will be Rs.7,80,000 (= 1500 x 520). At the same time, you will square up your long position in the futures contract. Suppose that the futures price at that moment is Rs.521.20. Then, the gain on your futures position will be the difference between the price at which you took the long position and the price at which you squared up the position. Therefore, the gain on futures position is Rs. (521.20 – 457.30) x 1500 = Rs.63.90 x 1500 which is Rs.95,850.

Thus, although the share price shot up and you were able to purchase the shares only at a higher price in the cash market, you also made a profit on the long futures position. Hence, the net cost of the shares is the cost of buying in the cash market less the gain on the futures position.

Cost of buying in cash market	Rs. 7,80,000
Less: Gain on futures position	(-) Rs. 95,850
Net cost of buying the shares	Rs. 6,84,150
Net cost per share (= 6,84,150 / 1500)	Rs. 456.10

The effective purchase price per share is Rs.456.10 which is quite close to the futures purchase price of Rs.457.30 at which you have taken the initial long position.

Now, consider the other scenario where the stock price has declined to Rs.390 by 20th June. Your total outlay on the purchase of ABC Ltd shares in the spot market will be Rs.5,85,000 (= 1500 x 390). At the same time, you will square-off your long position in the futures contract. Suppose that the futures price at that moment is Rs.391.10. You will then make a loss on your futures position, equal to the difference between the price at which you took the long position and the price at which you squared up the position. Hence the loss is Rs. (457.30 – 391.10) x 1500 = Rs.66.20 x 1500 which is Rs.99,300 loss.

Thus, although the share price declined and you were able to purchase the shares at a lower price in the cash market, you also made a loss on the long futures position. Hence,

the net cost of the shares is the cost of buying the shares in the cash market plus the loss incurred on the futures position.

Cost of buying in cash market	Rs. 5,85,000
Add: Loss on futures position	(+) Rs. 99,300
Net cost of buying the shares	Rs. 6,84,300
Net cost per share (= 6,84,300 / 1500)	Rs. 456.20

Therefore, the effective purchase price per share becomes Rs.456.20 which is again quite close to the initial futures price of Rs.457.30.

The above example shows that a long position in a futures contract enables an investor to lock in a price for a planned purchase at a future date. Thus, whether the stock price rises or falls over the hedge interval, the investor can largely eliminate his price risk.

Short hedge using stock futures:

A short hedge using stock futures is taken to hedge the price risk of a planned future sale of a stock. Consider that you are planning to sell 1200 shares of PQR Ltd on July 10, 20XX to raise money for paying a personal loan due in that month. Suppose that the shares are trading at Rs.1690 today, i.e. on May 10, 20XX and the July futures contract for PQR Ltd shares is trading at Rs.1706. What is the risk to which you are exposed in this situation?

The risk is that between today, i.e., May 10 and the date of the planned sale, i.e., July 10, the stock price may fall steeply and you may receive a much lower amount on your sale of shares. To hedge this price risk, you can take a short position in the PQR Ltd stock futures contract today (the contract size is 600). Since you want to hedge 1200 shares, you will short 2 contracts of PQR Ltd July futures at the prevailing futures price of Rs.1706.

Now suppose that on 10th July you are able to sell the 1200 shares in the spot market. The share price could have increased or declined till that date. Let us look at both these scenarios:

Suppose that the stock price has fallen to Rs.1440. You will realize Rs.17,28,000 on the sale of shares (= 1440 x 1200). This amount is lower than what you would have raised had you sold the shares on 10th May itself. However, note that the futures price on 10th July would also be lower. Suppose that the futures price is Rs.1441 and you square-off the short position at that price. The gain on futures position would be Rs. (1706 – 1441) x 600 x 2 = Rs.318000. So, the actual amount that you receive on the sale is the sum of the amount that you receive in the cash market and the gain you made on the short futures position, i.e. 17,28,000 + 3,18,000 = 20,46,000. The effective selling price per share then works out to Rs. 1705. This is quite close to the price at which you initially sold the July futures, which was Rs.1706.

Amount received on selling in cash market	Rs.17,28,000
Add: Gain on short futures position	(+) Rs. 3,18,000
Total amount received on sale	Rs. 20,46,000
Selling price per share (= 20,46,000 / 1200)	Rs. 1705.00

Now, consider the other scenario where the share price rises sharply to Rs.1800 by 10th July. In that case, you will be able to sell your shares in the spot market at a price higher than the price that prevailed on 10th May. The amount received from the sale in the cash market would be Rs.21,60,000 (= 1800 x 1200). However, remember that your short futures position would be squared-off at a higher price, leading to a loss. Suppose that the futures price on 10th July is Rs.1802. So, squaring off the futures position would lead to a loss of Rs.1,15,200 (= (Rs.1706-1802) x 2 x 600). This loss would reduce the net amount received on the sale to Rs.20,44,800 (= 21,60,000 – 1,15,200). The selling price per share would then be Rs.1704 (= 2044800/1200). Again, this is quite close to the price at which you sold the July futures contracts earlier (which was at Rs 1706).

The above example shows how an investor can lock in his selling price for a planned sale of shares in the future.

Hedging a portfolio using index futures:

We saw in Unit 3 that index futures can be used to hedge the risk of a portfolio of stocks. Suppose that you have a portfolio consisting of 15 large-cap stocks from different sectors. Since the portfolio is well-diversified, the specific risk is almost/near zero. However, the portfolio is still subject to the systematic or market risk. Suppose that you are worried about a potential market crash in the next one month. What are the alternatives available to you? You can either: (i) sell the entire portfolio today and sit on cash, or (ii) reduce the systematic risk of your portfolio using index futures.

To hedge the systematic risk of the portfolio, you need to take a short position in the index futures. In this way, even if there is a market crash and you make a loss on the portfolio, you will make a profit on the short position in index futures. As discussed in Unit 3, you need to calculate a hedge ratio for the portfolio to decide how many lots of index futures you should go short. Suppose that the market value of the portfolio is Rs.90,00,000, the portfolio beta is 1.3 and the index futures price is 17700 with a lot size of 50. The hedge ratio will be calculated as:

$$\frac{(1.3 * 90{,}00{,}000)}{(17700 * 50)}$$

This works out to 13.22 contracts. Thus, you should take a short position in 13 index futures contracts to hedge the portfolio risk.

Using futures for trading or speculation:

Although futures contracts were originally created for hedging price risk, they are widely used for trading. Investors having a bullish view on the underlying stock or index, i.e., those who expect the stock price or index level to increase, take a long position in the stock futures or index futures contract. Investors who are bearish on the stock or index, i.e., those who expect the stock price or index level to fall, take a short position in the stock futures or index futures contract.

Bullish view: Long futures:

Suppose that a futures trader expects the stock price of XYZ Ltd to rise from Rs. 1298 to Rs.1350 over the next week. The near-month XYZ futures contract is currently traded at Rs.1300. What strategy should the trader follow?

Since the trader is bullish on the stock price of XYZ Ltd, he can either buy the stock or go long in a stock futures contract on XYZ. Buying the stock means an immediate cash outflow for the trader. Suppose that the lot size of the futures contract is 850. A long position in a single futures contract gives the trader a position equivalent to buying 850 shares, but without paying the price of 850 shares at the onset. The contract value for the long position is Rs.11,05,000 (= Rs 1300 x 850). The only cash outlay for the futures position is the margin that the trader must pay to his broker. Assume that the margin is Rs.2,21,000 (i.e., 20% of the contract value). Suppose that a week later the stock is traded at Rs.1345 and the futures contract is trading at Rs.1346. The following table shows the return on investment for the trader, if he had: (a) purchased the shares in the cash market, or (b) taken a long position in the futures.

(a) Purchase of 850 shares of XYZ Ltd	(b) Long position in XYZ futures contract (lot size: 850)
Cash outflow is the cost of buying these shares: 850 x Rs.1298 = Rs.11,03,300	Cash outflow is the margin on the futures position: Rs.2,21,000
Profit on selling the shares = Rs.39,950 i.e., (1345-1298) * 850	Profit on squaring-off of futures position = Rs.39,100, i.e. (1346-1300)* 850
Return on investment: 3.62% (39950/11,03,300)	Return on investment: 17.69% (39100/2,21,000)

This example explains why stock and index futures contracts are so popular among investors. These contracts offer the benefit of 'leverage' so that investors can make much higher returns on a lower capital outlay as compared to an outright purchase of shares.

Bearish view: Short futures:

Suppose that a trader expects the stock price of RSB Bank to fall from Rs.1595 to Rs.1520 over the next few days. The stock futures contract is traded at Rs.1602. The trader can

either: (a) sell shares of RSB Bank today and buy the same shares back at a lower price after a few days, or (b) he can short RSB Bank futures today and cover the short position at a lower price after a few days. Selling the shares today would require the trader to deliver these shares on the settlement date. Hence selling in cash market is possible only if the trader holds the shares in his demat account. However, the trader can always short the RSB Bank futures contract instead of selling actual shares. Again, shorting the futures contract would require the trader to deposit a margin with his broker. Assume that the lot size of RSB Bank futures is 550. The contract value is Rs.8,81,100 (= 550 x 1602). Assuming that the margin is 20% of this value, the cash outlay on the trader's short position is Rs.1,76,220.

Suppose that the stock price falls to Rs.1525 over the next week and the futures price becomes Rs.1527. The trader can now square off his short position at 1527. The gain on the short position is Rs.41,250, i.e. (1602-1527) x 550. On an initial cash outlay of Rs.1,76,220, the return on investment is 23.41% (= 41250 / 176220).

Thus, shorting a futures contract makes it possible for market participants to express a bearish view on the stock or index, without owning the stock or index.

Using futures for arbitrage:

As explained in Unit 3, traders look for arbitrage opportunities using index and stock futures. Basically, they compare the fair futures price with the actual or traded price of the futures contract. If the traded price is higher than the fair futures price, cash-and-carry arbitrage is profitable. If the traded price is lower than the fair futures price, reverse cash-and-carry arbitrage becomes profitable.

Illustrations:

Cash-and-carry arbitrage

The following data is available on stock A.

Cash market price	Rs. 1500
3-month Futures price	Rs. 1550
Contract multiplier for stock	100 shares

Assume a cost of carry of 9% per annum i.e. around 0.75% per month.

Theoretical/ fair price of three-month futures contract is 1534.13 (= 1500* $e^{0.0075*3}$ or 1500* $e^{0.09*3/12}$). Going by this theoretical price, we may say that the 3-month futures contract on stock A is overvalued. To take advantage of the mispricing, an arbitrageur may buy 100 shares of stock A and sell 1 futures contract at their current prices. This would result in the arbitrage profit of Rs. 1587 (= 100 X 15.87), which is the difference between actual and fair futures prices for 100 shares. Position of the arbitrageur in various scenarios of stock price would be as follows:

Case I: Stock rises to Rs. 1580 on expiry day

Profit on underlying = (1580 – 1500) x 100 = Rs. 8000
Loss on futures = (1580 - 1550) x 100 = Rs. 3000
Gain on Arbitrage = Rs. 5000
Cost of Arbitrage in terms of financing (Rs. 34.13 * 100 shares) = Rs. 3413
Net gain out of arbitrage = (5000 – 3413) = Rs. 1587

Case II: Stock falls to Rs.1480 on expiry day

Loss on underlying = (1500 - 1480) x 100 = Rs. 2000
Profit on futures = (1550 - 1480) x 100 = Rs. 7000
Gain on Arbitrage = Rs. 5000
Cost of Arbitrage in terms of financing (Rs. 34.13 * 100 shares) = Rs. 3413
Net gain out of arbitrage = (5000 – 3413) = Rs. 1587

Reverse cash-and-carry arbitrage

The reverse cash-and-carry arbitrage is done when the futures contract is trading at a discount to the cash market price. Let us look at the following data on stock B:

Cash market price	Rs. 100
One-month futures price	Rs. 90

The prices trading in the market reflect a negative cost of carry, which offers an opportunity to the traders to execute reverse cash-and-carry arbitrage as cost of carry is expected to reverse to positive at some point in time during contract's life. Otherwise, also, if the trader carries his position till the expiry, it will yield him an arbitrage profit. The assumption in implementing this arbitrage opportunity is that the arbitrageur has got the stock to sell in the cash market, which will be bought back at the time of reversing the position. If stock is not available, arbitrageur needs to borrow the stock to implement the arbitrage. In that case, while analysing the profitability from the transaction, cost of borrowing of stock should also be taken into account.

Assuming the contract multiplier for futures contract on stock B is 200 shares, to execute the reverse cash-and-carry, arbitrageur would buy one futures contract at Rs 90 and sell 200 shares of stock B at Rs 100 in cash market. This would result in the arbitrage profit of Rs 2000 (= 200 X Rs 10). Position of the arbitrageur in various scenarios of stock price would be as follows:

Case I: Stock rises to Rs. 110 on expiry day

Loss on underlying = (110 - 100) x 200 = Rs. 2000

Profit on futures = (110 - 90) x 200 = Rs. 4000
Net gain = Rs. 2000

Assume that the arbitrageur can invest the proceeds from his sale of 200 shares in the cash market at 9% p.a. for one month. The interest earned on this investment (with continuous compounding) works out to Rs.150.56 ((20000* $e^{0.09*1/12}$) – 20000). Taking this interest earned into account, the total gain from this arbitrage position is Rs.2000 + 150.56, i.e. Rs. 2150.56.

Case II: Stock falls to Rs. 85 on expiry day
Profit on underlying = (100 - 85) x 200 = Rs. 3000
Loss on futures = (90 - 85) x 200 = Rs. 1000
Net gain = Rs. 2000

Once again, assuming that the arbitrageur can invest the proceeds from his cash market sale of 200 shares at 9% p.a. for one month, the interest earned on this investment would be Rs.150.56 as explained earlier. Taking this interest earned into account, the total gain from this arbitrage would be Rs.2150.56.

Our assumption in the above example is that both the positions (i.e., in cash and futures) were held until maturity. The futures price converges with the spot price of underlying on expiry day and the arbitrageur can buy the stock back at the closing price / settlement price of the day. However, one can always square-off one's position before the expiry of the contract, whenever one feels that the market prices are favourable. If in the above example of reverse cash-and-carry arbitrage, suppose that on 15th of the same month the spot price of stock B is Rs. 130 and the futures contract is trading at Rs. 135. The arbitrageur could reverse both his positions i.e., by buying the stock at Rs. 130 and selling the futures at Rs. 135. This would result in the following:

Loss on underlying = (130 - 100) x 200 = Rs. 6000
Profit on futures = (135 - 90) x 200 = Rs. 9000
Net gain = Rs. 3000

Again, assuming that the arbitrageur invests the initial amount received on the cash market sale of 200 shares at 9% p.a. for 15 days, the interest on this amount works out to Rs. 74.11 (= (20000* $e^{0.09*15/365}$) – 20000). Hence, the total gain from reverse cash-and-carry arbitrage becomes Rs.3000 + Rs.74.11, i.e. Rs.3074.11.

Calendar spread
Calendar spread refers to the arbitrage between futures contracts of different expiration months. In this strategy, the arbitrageur buys and sells the futures contracts of two different months. To execute this strategy, the arbitrageur must identify which contract to buy or sell. The principal rule of arbitrage is that one must buy the underpriced contract

and sell the overpriced one. Hence, the arbitrageur needs to compute the fair price of both futures contracts and compare these with the traded prices, to decide which contract is overpriced and which one is underpriced.

For example, suppose that a stock is traded at Rs.120 and the near-month futures and mid-month futures are traded at Rs.121.30 and Rs.121.50. Suppose further that the interest rate is around 8% p.a.

Now the fair price of the near-month futures works out to $120* e^{0.08*1/12}$ which is 120.80 while the fair price of the mid-month futures is $120* e^{0.08*2/12}$, i.e., 121.61. As per the fair price computation, the difference between the prices of both futures contracts should ideally be around 81 paise, but currently this difference has narrowed to just 20 paise. This means that the near-month futures contract is overpriced relative to the mid-month futures contract. Hence the arbitrageur will short the near-month futures contract at Rs 121.30 and go long the mid-month futures contract at Rs 121.50. This is done because sooner or later, the difference in the prices of the two futures contracts (i.e., the spread) is expected to come back to the fair difference. The arbitrageur makes a profit when the actual spread returns to the fair spread and then he unwinds both the positions.

Case 1: The stock price closes at Rs.122 on the expiry date of the near-month futures contract and the mid-month futures contract trades at Rs.122.82:

Near-month futures price: 122
Loss on near-month futures: 121.30 – 122 = 0.70
Mid-month futures price: 122.82
Gain on mid-month futures: 1.32 (=122.82 – 121.50)
Net gain on the calendar spread: Rs 0.62 (= 1.32 - 0.70)

Case 2: The stock price closes at 120 on the expiry date of near-month futures and the mid-month futures contract trades at Rs.120.80:

Near-month futures price: 120
Gain on near-month futures: 121.30 – 120 = 1.30
Mid-month futures price: 120.80
Loss on mid-month futures: 0.70 (=121.50 - 120.80).
Net gain on the calendar spread: Rs 0.60 (= 1.30 - 0.70)

The above example shows that calendar spreads are typically low risk - low return strategies. The return is low because the arbitrageur is simply trying to capture the small amount of mispricing in the prices of the pair of futures contracts. There is no directional bet involved in calendar spreads. The risk is low because the arbitrageur takes opposite positions in both contracts. Hence, the arbitrageur is protected from large losses, regardless of whether the stock price rises or declines.

In practice, calendar spread arbitrage opportunities are difficult to find. Index and stock futures contracts are quite liquid, and a large number of buyers and sellers continuously track these futures prices. As a result, any instances of mispricing are spotted quickly, and arbitrageurs rapidly exploit these arbitrage opportunities so that the mispricing disappears within a very short timeframe. For the calendar spread arbitrage to make the anticipated profit, it is essential that the long and short positions must be entered simultaneously and squared up at the same instant. Any delay in execution of the other leg of the transaction after the first leg has been executed, will reduce the profitability or may even lead to losses.

5.2 Use of Options for Trading and Hedging

Trading strategies using options:

The most common trading strategies using options include spreads, straddles and strangles. Let us consider each of these strategies using numerical examples.

Spreads involve combining options on the same underlying and of same type (call/ put) but with different strikes and maturities. These are limited profit and limited loss positions. They are primarily categorized into three sections as:

- Vertical Spreads
- Horizontal Spreads
- Diagonal Spreads

Vertical Spreads

Vertical spreads are created by using options having same expiry date but different strike prices. Further, these can be created either using calls as combination or puts as combination. These can be further classified as:

- Bullish Vertical Spread
    - Using Calls
    - Using Puts
- Bearish Vertical Spread
    - Using Calls
    - Using Puts

Bullish Vertical Spread using Calls

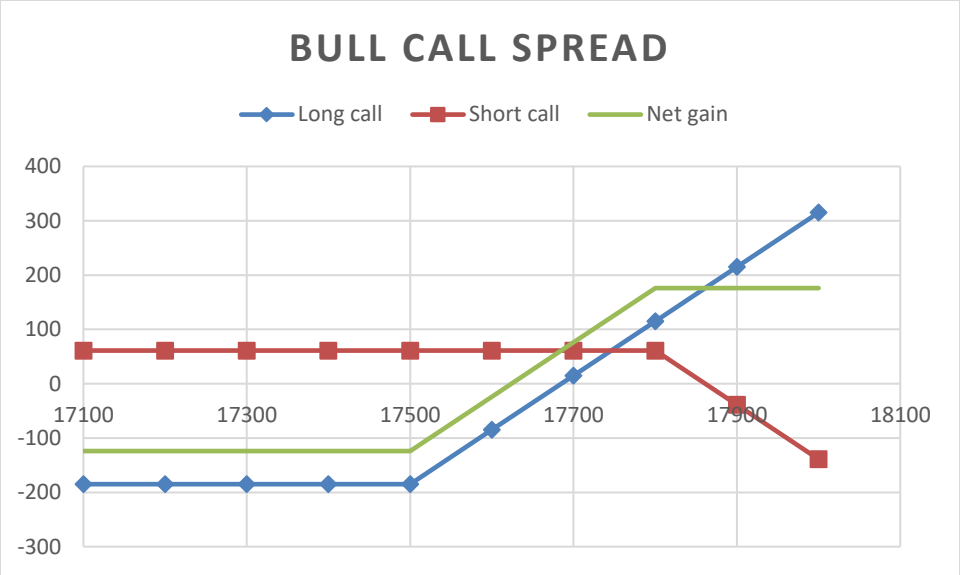
A bull call spread is created when the underlying view on the market is positive or bullish, but the trader would also like to reduce the cost of his position. So, he takes one long call position with a lower strike price and sells a call option with a higher strike. As the lower strike call costs more than the premium earned by selling a higher strike call, the position involves a net cash outflow to begin with. Secondly, as the higher strike call is sold, all gains on the long call beyond the strike price of the short call get negated by losses on the

short call. To capture more profits from his long call, the trader can short a call with as high a strike price as possible. However, this will result in his cost coming down only marginally, as the higher strike calls will fetch lesser and lesser premium.

For example, a trader is bullish on the market and decides to go long on 17500 strike call option by paying a premium of Rs 185. He does not expect the market to rise above 17800, and so he shorts a 17800 call option and receives a premium of Rs 61. His net payoff for various price moves (after adjusting the premium paid or received) will be as follows:

Option	Call	Call
Long/Short	Long	Short
Strike	17500	17800
Premium	185	61
Spot	17500	

Index value at expiry	**P&L long call**	**P&L short call**	**Net gain**
17100	-185	61	-124
17200	-185	61	-124
17300	-185	61	-124
17400	-185	61	-124
17500	-185	61	-124
17600	-85	61	-24
17700	15	61	76
17800	115	61	176
17900	215	-39	176
18000	315	-139	176



As can be seen from the above payoff chart, it is a limited profit and limited loss position. Maximum profit in this position is Rs. 176 and maximum loss is Rs.124. The break-even point for this spread is 17624. This is obtained by adding the net premium paid (i.e., 185-61=124) to the lower strike price, i.e. 17500 + 124.

Bullish Vertical Spread using Puts

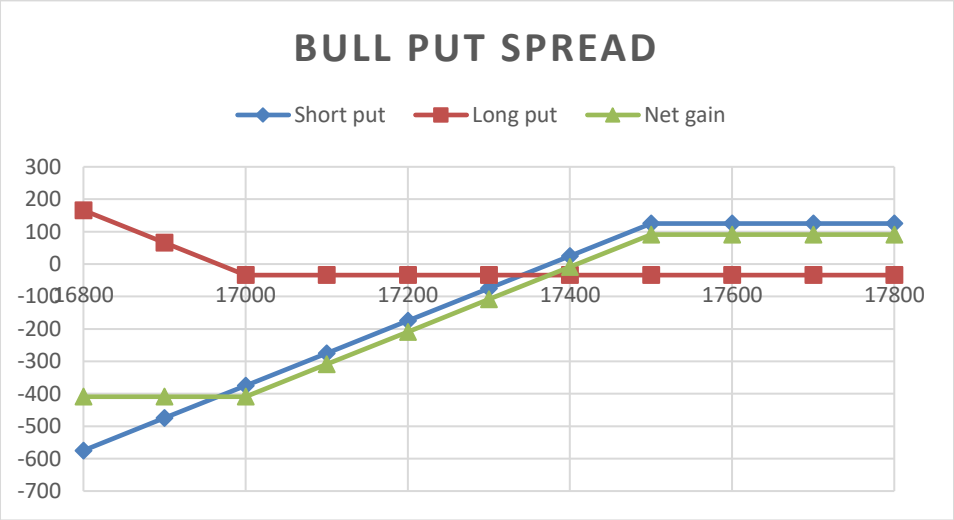
Here again, the view on the market is bullish and hence, the trader would like to short a put option. If the index goes up, the trader will end up with the premium on sold puts. However, in case of a fall in the index, the trader will face the risk of unlimited losses. In order to put a floor to his downside, he may buy a put option with a lower strike. While this would reduce his overall upfront premium, the benefit is the embedded insurance against unlimited potential loss on short put. This is a net premium receipt strategy.

Let us see this with the help of an example, where the trader goes short a put option of strike 17500 and receives a premium of Rs 125 and goes long a put option of strike 17000 and pays a premium of Rs 34:

Option	Put	Put
Long/Short	Short	Long
Strike	17500	17000
Premium	125	34
Spot	17500	

Index values at expiry	**P&L short put**	**P&L long put**	**Net gain**
16800	-575	166	-409
16900	-475	66	-409

17000	-375	-34	-409
17100	-275	-34	-309
17200	-175	-34	-209
17300	-75	-34	-109
17400	25	-34	-9
17500	125	-34	91
17600	125	-34	91
17700	125	-34	91
17800	125	-34	91



As can be seen from the chart above, this is a limited profit and limited loss position. Maximum profit in this position is Rs 91 (the difference between the premium received and paid) and maximum loss is Rs 409. The break-even point for this position is 17409. This is obtained by deducting the net premium received (i.e., 125-34=91) from the higher strike price, i.e., 17500.

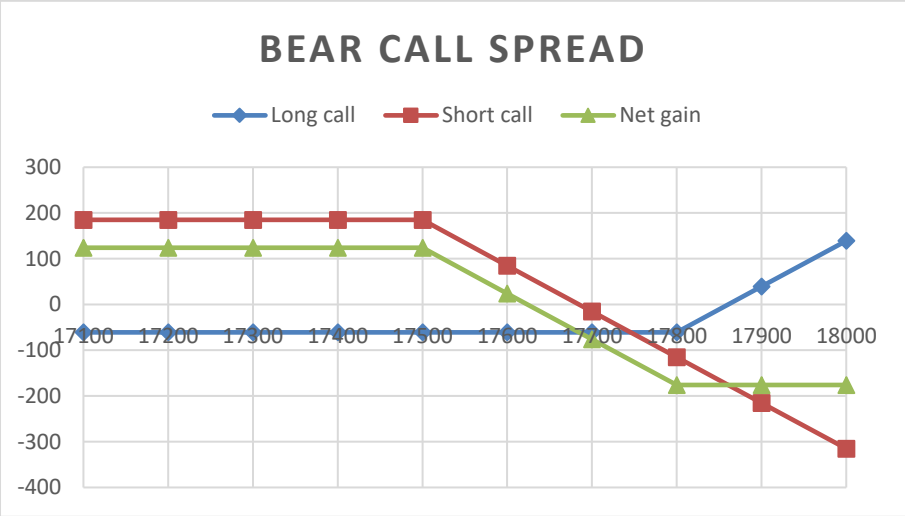
Bearish Vertical Spread using calls

Here, the trader is bearish on the market and so he shorts a low strike call with a high premium. The risk in a naked short call is that if prices rise, losses could be unlimited. So, to prevent his unlimited losses, he also goes long a higher strike call costing a smaller premium. Thus, in this strategy, he starts with a net inflow.

Let us see this with the help of the following table:

Option	Call	Call
Long/Short	Long	Short
Strike	17800	17500
Premium	61	185
Spot	17500	

Index values at expiry	P&L long call	P&L short call	Net gain
17100	-61	185	124
17200	-61	185	124
17300	-61	185	124
17400	-61	185	124
17500	-61	185	124
17600	-61	85	24
17700	-61	-15	-76
17800	-61	-115	-176
17900	39	-215	-176
18000	139	-315	-176



As can be seen from the picture above, this is a limited profit and limited loss position. Maximum profit in this position is Rs 124 (net premium received) and maximum loss is Rs 176. The break-even point for this position is 17624.

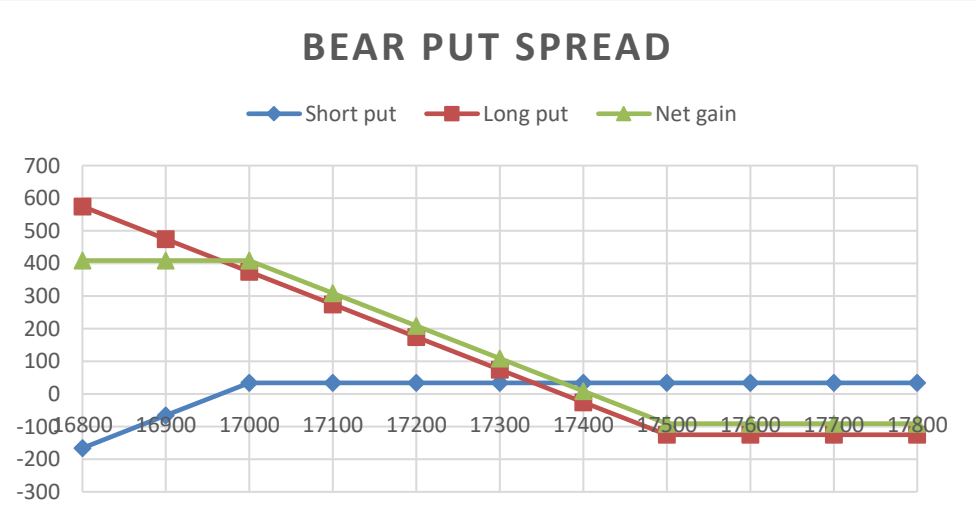
Bearish Vertical Spread using puts

Here, again the trader is bearish on the market and so goes long in one put option by paying a premium. Further, to reduce his cost, he shorts another low strike put and receives a premium.

For example, if a trader goes long in a put option of strike 17500 and pays a premium of Rs 125 and at the same time to reduce his cost, shorts a 17000 strike put option and earns a premium of Rs 34, his net profits/ losses would be as under:

Option	Put	Put	
Long/Short	Short	Long	
Strike	17000	17500	
Premium	34	125	
Spot	17500		

Index values at expiry	P&L short put	P&L long put	Net gain
16800	-166	575	409
16900	-66	475	409
17000	34	375	409
17100	34	275	309
17200	34	175	209
17300	34	75	109
17400	34	-25	9
17500	34	-125	-91
17600	34	-125	-91
17700	34	-125	-91
17800	34	-125	-91



As can be seen from the picture above, it is a limited profit and limited loss position. Maximum profit in this position is Rs 409 and maximum loss is Rs 91. The break-even point for this position is 17409.

Horizontal Spread

A horizontal spread involves options of the same type, having the same strike price, but different expiry dates. This is also known as time spread or calendar spread. Here, it is not possible to draw the payoff chart as the expiry dates of the underlying options are

different. The rationale for horizontal spreads is that these two options would have different time values and the trader believes that the difference between the time values would shrink or widen. This is essentially a bet on the narrowing or widening of the difference in the premium of the two options.

Diagonal spread

Diagonal spread involves a combination of options on the same underlying but different expiry dates as well as different strikes. Again, as the two options in the spread have different maturities, it is not possible to draw payoff diagrams. These are much more complicated in nature and in execution. These strategies are more suitable for the OTC market than for the exchange-traded markets.

Straddles

This strategy involves two different types of options (call and put) with the same strike prices and same maturity. A long straddle position is created by buying a call and a put option of the same strike and same expiry date whereas a short straddle is created by shorting a call and a put option of same strike and same expiry date.

Let us say a stock is trading at Rs 6,000 and premiums for ATM call and put options are Rs 257 and Rs 136 respectively.

Long Straddle

If a person buys both a call and a put at these prices, then his maximum loss will be equal to the sum of these two premiums paid, which is equal to Rs 393 (= 257 + 136). Any price movement from here in either direction would first result in that person recovering his premium and then making a profit. This strategy is undertaken when the trader is not certain of the direction in which the stock will move in the near future, but he expects a significant movement in the stock price, either upwards or downwards.

Now, let us analyse his position on various market moves. Let us say the stock price falls to 5300 at expiry. Then, his payoffs from the strategy would be:
Long Call: - 257 (market price is below strike price, so option expires worthless)
Long Put: - 136 - 5300 + 6000 = 564
Net Flow: 564 – 257 = 307

As the stock price keeps moving down, loss on long call position is limited to premium paid, whereas profit on long put position keeps increasing.

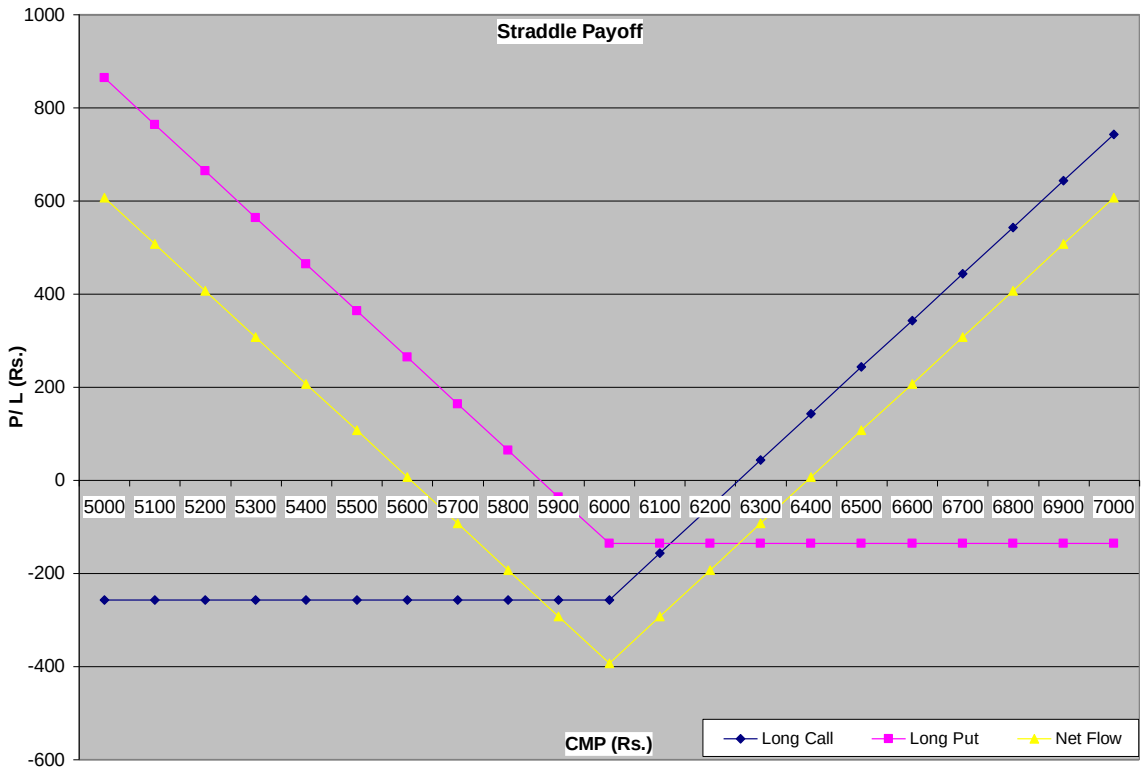
Now, consider that the stock price shoots up to 6700.
Long Call: - 257 – 6000 + 6700 = 443
Long Put: - 136
Net Flow: 443 – 136 = 307

As the stock price keeps moving up, loss on long put position is limited to premium paid, whereas profit on long call position keeps increasing.

Thus, it can be seen that the strategy yields profits for huge swings in either direction. However, there would be a band within which the position would result into losses. This position would have two Break even points (BEPs) and they would lie at "Strike – Total Premium" and "Strike + Total Premium". Combined pay-off may be shown as follows:

Option	Call	Put
Long/Short	Long	Long
Strike	6000	6000
Premium	257	136
Spot	6000	

CMP	Long Call	Long Put	Net Flow
5000	-257	864	607
5100	-257	764	507
5200	-257	664	407
5300	-257	564	307
5400	-257	464	207
5500	-257	364	107
5600	-257	264	7
5700	-257	164	-93
5800	-257	64	-193
5900	-257	-36	-293
6000	-257	-136	-393
6100	-157	-136	-293
6200	-57	-136	-193
6300	43	-136	-93
6400	143	-136	7
6500	243	-136	107
6600	343	-136	207
6700	443	-136	307
6800	543	-136	407
6900	643	-136	507
7000	743	-136	607



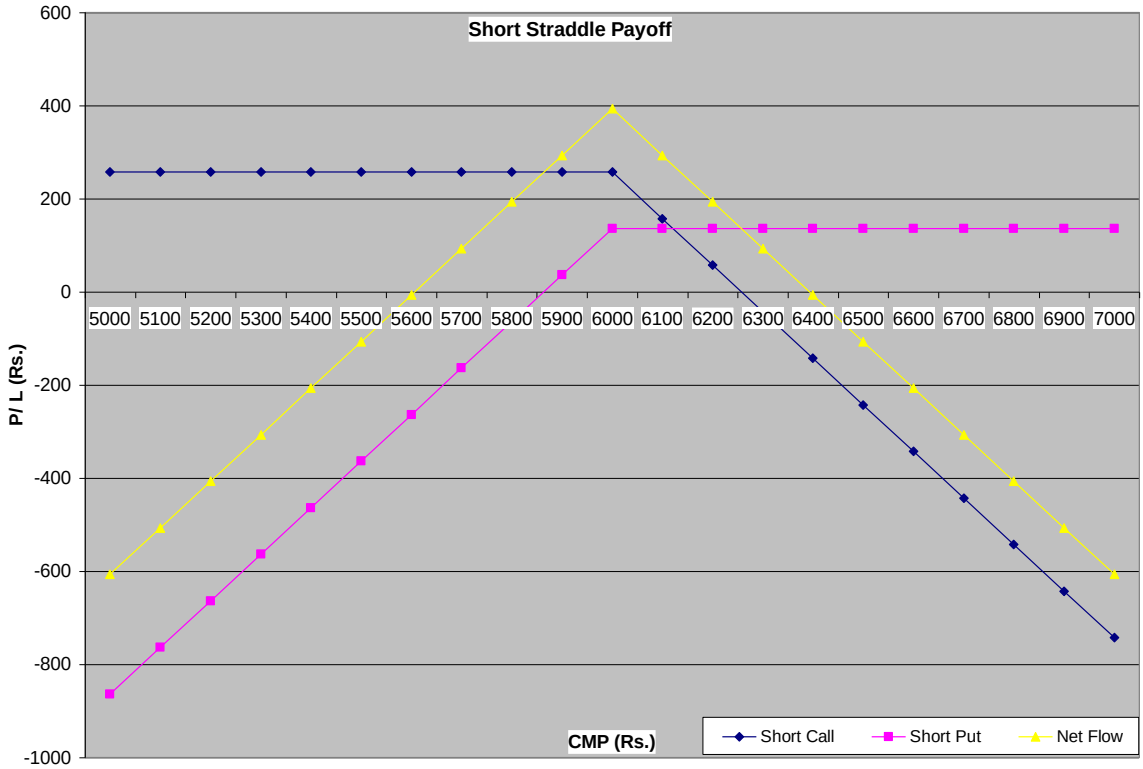
It may be noted from the table and picture, that the maximum loss of Rs. 393 would occur to the trader if the underlying expires at the strike price of the options viz. 6000. Further, as long as the underlying stock expires between 6393 and 5607, he would always incur a loss which would depend on the level of underlying. His profit would start only after recovery of his total premium of Rs. 393 in either direction, and that is the reason for the two breakeven points in this strategy.

Short Straddle

This would be the exact opposite of long straddle. Here, the trader's view is that the price of underlying would not move much or remain stable. So, he sells a call and a put so that he can profit from the premiums. As the position of short straddle is just opposite of long straddle, the payoff chart would be just inverted, so what was a loss for the long straddle would become a profit for the short straddle. The details of the position are as follows:

Option	Call	Put
Long/Short	Short	Short
Strike	6000	6000
Premium	257	136
Spot	6000	

CMP	Short Call	Short Put	Net Flow
5000	257	-864	-607
5100	257	-764	-507
5200	257	-664	-407
5300	257	-564	-307
5400	257	-464	-207
5500	257	-364	-107
5600	257	-264	-7
5700	257	-164	93
5800	257	-64	193
5900	257	36	293
6000	257	136	393
6100	157	136	293
6200	57	136	193
6300	-43	136	93
6400	-143	136	-7
6500	-243	136	-107
6600	-343	136	-207
6700	-443	136	-307
6800	-543	136	-407
6900	-643	136	-507
7000	-743	136	-607



It is clear that this strategy is a limited profit and unlimited loss strategy and should be undertaken with significant care. Further, it will incur a substantial loss for the trader if the market moves significantly in either direction – up or down.

Strangles

This outlook of this strategy is similar to that of a straddle, but the implementation, aggression and cost are different.

Long Strangle

As in case of straddle, the outlook here (for the long strangle position) is that the market will move substantially in either direction, but while in a straddle, both options have the same strike price, strangles are constructed using different strike prices. Also, both the options (call and put) in this case are out-of-the-money and hence the premium paid is low.

Let us say the cash market price of a stock is 6100. The 6200 strike call is available at Rs 145 and 6000 put is trading at a premium of Rs 140. Both these options are out-of-the-money.

If a trader goes long both these options, then his maximum cost would be equal to the sum of the premiums of both these options. This would also be his maximum loss in worst case situation. However, if the stock starts moving in either direction, his loss would

remain the same for some time and then reduce. And, beyond a point (BEP) in either direction, he would make money. Let us see this with various price points.
If spot price falls to 5700 on maturity, his long put would make profits while his long call option would expire worthless.
Long Call: - 145
Long Put: - 140 - 5700 + 6000 = 160
Net Position: 160 - 145 = 15

As the stock price continues to go down, the long put position will become more and more profitable and the long call's loss would be limited to the premium paid.

In case the stock price rises to 6800 at expiry, the long call would become profitable and long put would expire worthless.

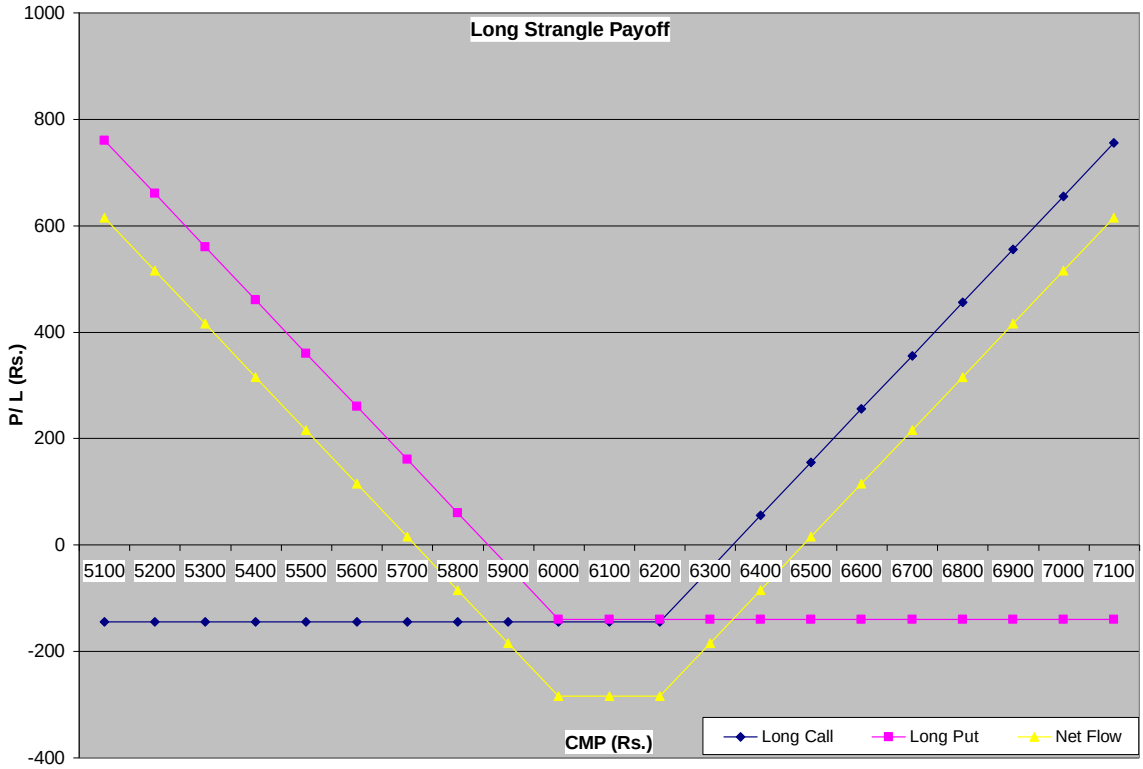
Long Call: - 145 - 6200 + 6800 = 455
Long Put: - 140
Net Position: 455 - 140 = 315

The payoff chart for long strangle is shown below:

Option	Call	Put
Long/Short	Long	Long
Strike	6200	6000
Premium	145	140
Spot	6100	

CMP	Long Call	Long Put	Net Flow
5100	-145	760	615
5200	-145	660	515
5300	-145	560	415
5400	-145	460	315
5500	-145	360	215
5600	-145	260	115
5700	-145	160	15
5800	-145	60	-85
5900	-145	-40	-185
6000	-145	-140	-285
6100	-145	-140	-285
6200	-145	-140	-285
6300	-45	-140	-185
6400	55	-140	-85

6500	155	-140	15
6600	255	-140	115
6700	355	-140	215
6800	455	-140	315
6900	555	-140	415
7000	655	-140	515
7100	755	-140	615



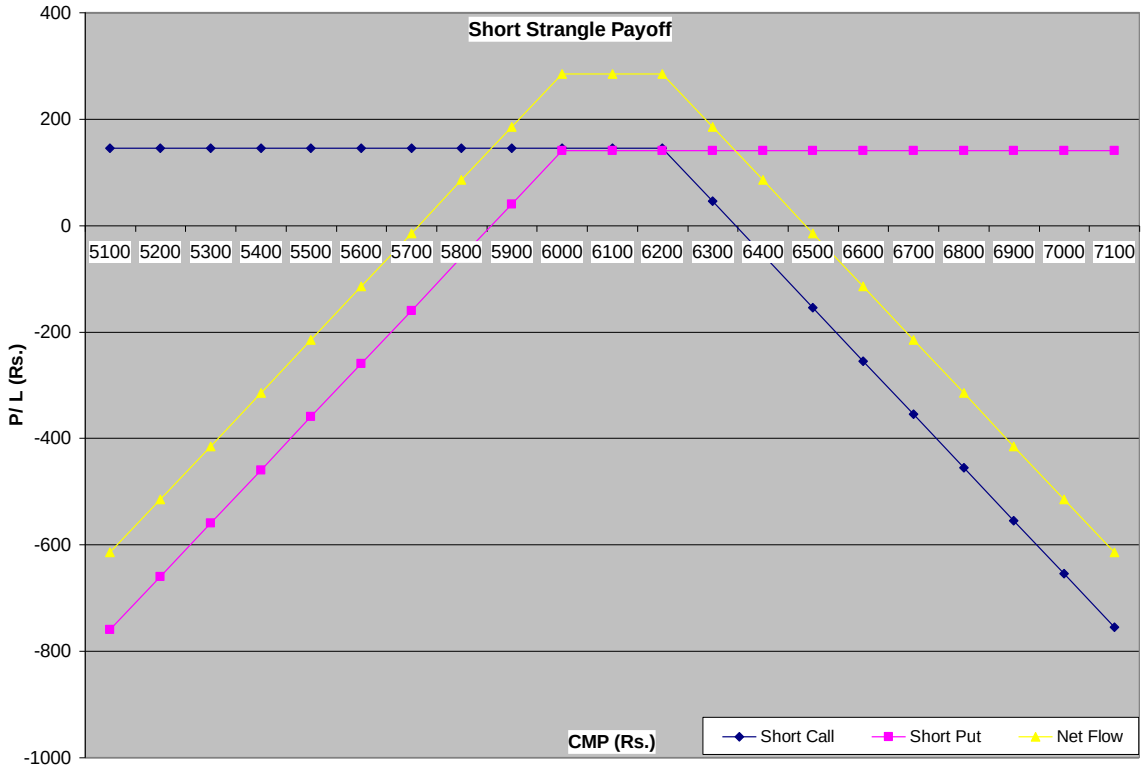
In this position, the maximum profit for the trader would be unlimited in both the directions – up or down and maximum loss would be limited to Rs. 285, which would occur if the underlying expired at any price between 6000 and 6200. The position would have two BEPs at 5715 and 6485. The trader would always incur a loss until the underlying crosses either of these prices.

Short Strangle

This is exactly opposite to the long strangle and involves a short position in two out-of-the-money options (call and put). The outlook, like in the short straddle, is that the underlying price will remain stable over the life of options. Payoffs for this position will be exactly opposite to that of a long strangle position. As always, the short position will make money, when the long position is in a loss and vice versa.

Option	Call	Put
Long/Short	Short	Short
Strike	6200	6000
Premium	145	140
Spot	6100	

CMP	Short Call	Short Put	Net Flow
5100	145	-760	-615
5200	145	-660	-515
5300	145	-560	-415
5400	145	-460	-315
5500	145	-360	-215
5600	145	-260	-115
5700	145	-160	-15
5800	145	-60	85
5900	145	40	185
6000	145	140	285
6100	145	140	285
6200	145	140	285
6300	45	140	185
6400	-55	140	85
6500	-155	140	-15
6600	-255	140	-115
6700	-355	140	-215
6800	-455	140	-315
6900	-555	140	-415
7000	-655	140	-515
7100	-755	140	-615



In this position, the maximum loss for the trader would be unlimited in both the directions – up or down and the maximum profit would be limited to Rs. 285, which would occur if the underlying expired at any price between 6000 and 6200. Again, the short strangle would have two BEPs at 5715 and 6485. The trader would always make a profit until the underlying crosses either of these prices.

Covered call

This strategy is used to generate extra income from existing holdings in the cash market. If an investor has bought a stock and intends to hold it for some time, then he would like to earn some income on the stockholding, without selling the stock. This would help to reduce his cost of acquisition. So how does an investor continue to hold on to the stock, earn income and reduce acquisition cost?

Suppose that an investor buys a stock in the cash market at Rs. 1590 and sells a call option with a strike price of 1600, thereby earning Rs. 10 as premium. If the stock price rises above Rs. 1590, he makes a profit in the cash market but starts losing in the option trade. For example, if the stock price rises to 1640:

Long Cash: Profit of 1640 – 1590 = 50
Short Call: – 1640 + 1600 + 10 = –30
Net Position: 50 – 30 = 20

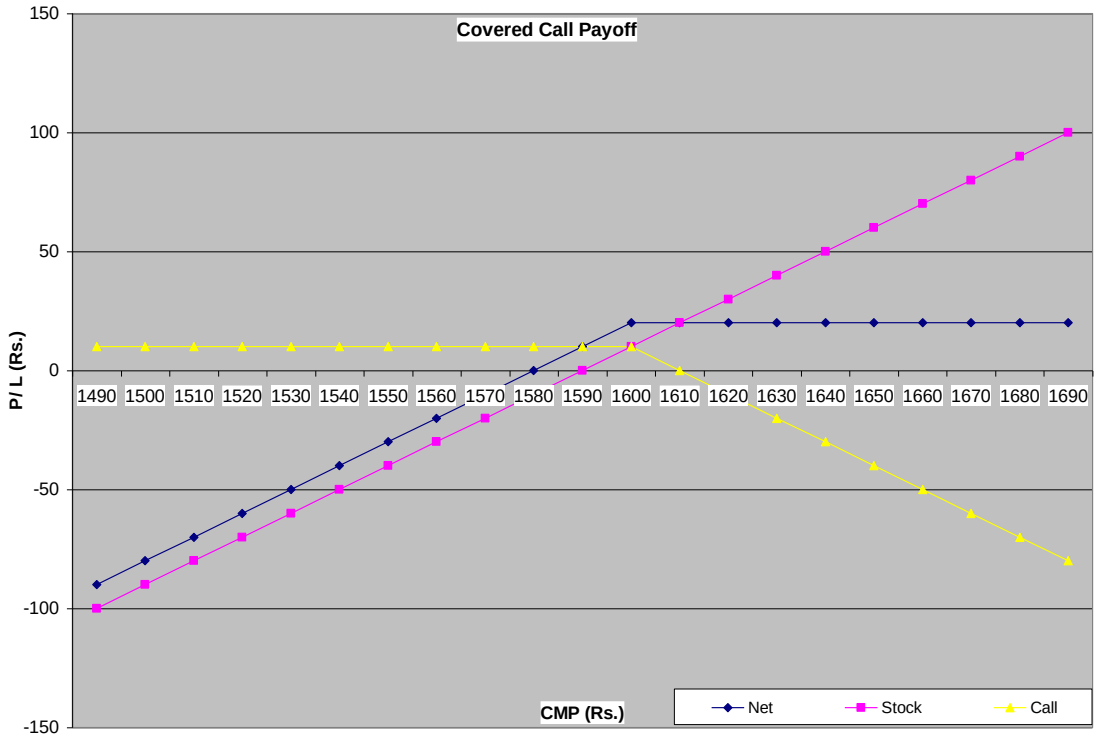
If the stock drops below Rs.1590, he loses in the cash market, but gets to keep the premium as income. For example, if the stock price falls to Rs.1520,

Long Cash: 1520 – 1590 = -70
Short Call: + 10 (The call holder will not exercise his right as he can buy the stock from the market at a price lower than strike, and so he will let the option expire and the seller gets to keep the premium.)
Net Position: -70 + 10 = -60

Therefore, the combined position of long stock and short call would generate the payoff as defined in the table and picture below:

Long Stock	1590
Strike Price	1600
Premium	10

CMP	Stock	Call	Net
1490	-100	10	-90
1500	-90	10	-80
1510	-80	10	-70
1520	-70	10	-60
1530	-60	10	-50
1540	-50	10	-40
1550	-40	10	-30
1560	-30	10	-20
1570	-20	10	-10
1580	-10	10	0
1590	0	10	10
1600	10	10	20
1610	20	0	20
1620	30	-10	20
1630	40	-20	20
1640	50	-30	20
1650	60	-40	20
1660	70	-50	20
1670	80	-60	20
1680	90	-70	20
1690	100	-80	20



From the table and the payoff chart we can see that the net position of a covered call strategy looks like 'short put' with a strike of 1600. This is because the covered call restricts the 'upside' or gains from the position while leaving a scope for unlimited losses. Hence, the covered call is called a 'synthetic short put' position.

If at that point of time, a 1600 strike put is available at any price other than Rs.20 (let us say Rs.17), an arbitrage opportunity exists, where the trader can create a synthetic short put position (covered call), earn a Rs. 20 premium and use the proceeds to buy a 1600 put for Rs.17, thereby making a risk-free profit of Rs.3. Indeed, one needs to also provide for frictions in the market like brokerage, taxes, administrative costs, funding costs, etc.

The most important factor in this strategy is the strike of the sold call option. If the strike price is close to the prevailing price of the underlying stock, it would fetch higher premium upfront but would lock the potential gain from the stock early. And, if the strike price is too far from the current price of underlying, while it would fetch low upfront premium, it would provide for a longer ride of money on the underlying stock. One must decide on this subject based on one's view on the stock price and the choice between upfront premium from the option and a potential gain from the movement of the underlying.

A simple perspective on the choice of strike price for the covered call is that, till the time the cash market price does not reach the pre-determined exit price, the long cash position can be used to sell calls of that target strike price. As long as the stock price stays below that target price (let's say 1600 in our case), we can write call option of 1600 strike and

keep earning the premium. The moment 1600 is reached in the spot market, we can sell in the cash market and also cover the short call position.

Collar

A collar strategy is an extension of the covered call strategy. Readers may recall that in case of covered call, the downside risk remains for falling prices; i.e. if the stock price moves down, losses keep increasing (covered call is similar to short put). To put a floor to this downside, we go long a put option, which essentially eliminates the downside of the short underlying/futures (or the synthetic short put).

In our example, we had assumed that a trader goes long a stock at 1590 and shorts a call option with a strike price of 1600 and receives Rs. 10 as premium. In this case, the BEP was 1580. If the stock price fell below 1580, loss could be unlimited whereas if price rose above 1600, the profit was capped at Rs. 20.

To limit the downside, let us say, we now buy an out-of-the-money put option of strike 1580 by paying a small premium of Rs. 7.

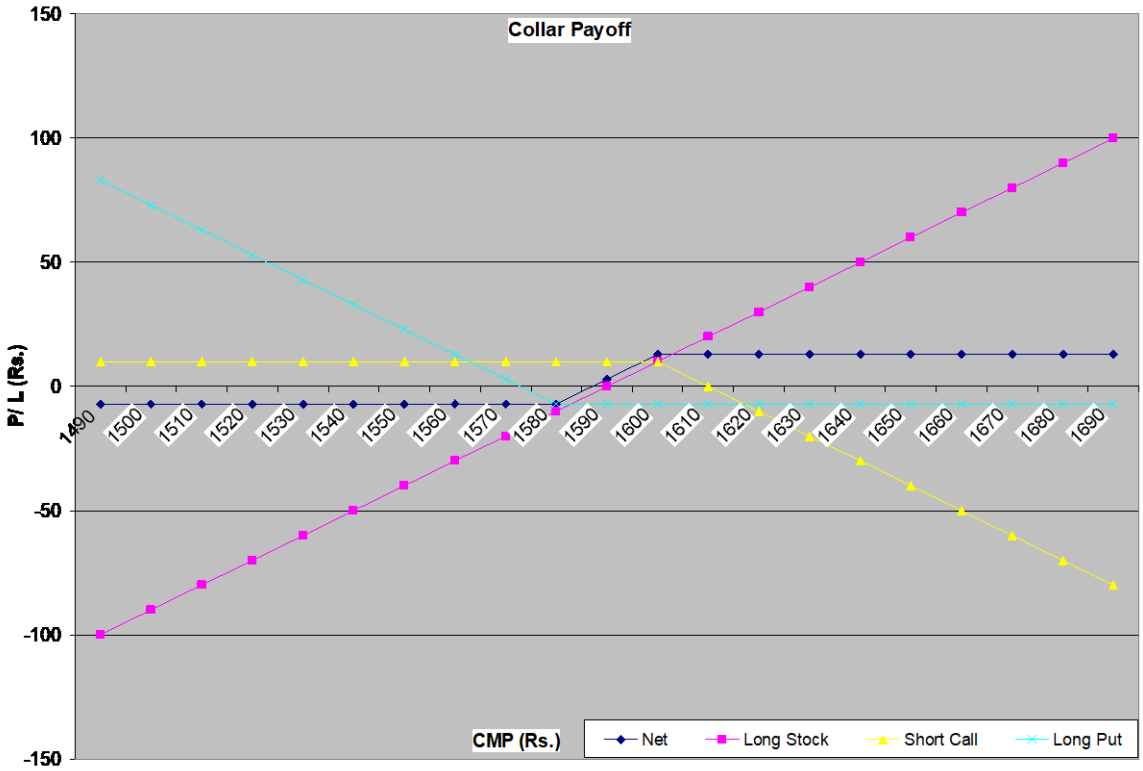
Now, if price of underlying falls to 1490 on maturity:
Long Stock: -1590 + 1490 = -100
Short Call: 10
Long Put: -7 – 1490 + 1580 = 83
Net Position: -100 + 10 + 83 = - 7 (in case of covered call this would have been -90)

If price rises to 1690 on maturity:
Long Stock: -1590 + 1690 = 100
Short Call: 10 – 1690 +1600 = - 80
Long Put: - 7
Net Position: 100 – 80 – 7 = 13 (in case of covered call this would have been + 20)

Combined position (i.e. long underlying, short call and long put) is as follows:

Long Stock	1590		Long Put	1580
Short Call	1600		Premium	7
Call Premium	10			
CMP	Long Stock	Short Call	Long Put	Net
1490	-100	10	83	-7
1500	-90	10	73	-7
1510	-80	10	63	-7
1520	-70	10	53	-7
1530	-60	10	43	-7
1540	-50	10	33	-7

1550	-40	10	23	-7
1560	-30	10	13	-7
1570	-20	10	3	-7
1580	-10	10	-7	-7
1590	0	10	-7	3
1600	10	10	-7	13
1610	20	0	-7	13
1620	30	-10	-7	13
1630	40	-20	-7	13
1640	50	-30	-7	13
1650	60	-40	-7	13
1660	70	-50	-7	13
1670	80	-60	-7	13
1680	90	-70	-7	13
1690	100	-80	-7	13



It is important to note here that while the long put helps in reducing the downside risk, it also reduces the maximum profit, which a covered call would have generated. Also, the BEP has moved higher by the amount of premium paid for buying the out-of-the-money put option.

Butterfly Spread

As a collar is an extension of the covered call, a butterfly spread is an extension of the short straddle. We may recollect that a short straddle has an unlimited downside, if the underlying moves significantly in either direction. To limit this downside, the trader buys one out-of-the-money call and one out-of-the-money put along with the short straddle. This results in a position with a pictorial payoff, which looks like a butterfly and so this strategy is called "Butterfly Spread".

A butterfly spread can be created with only calls, only puts or combinations of both calls and puts. Here, we are creating this position with the help of only calls. To do so, the trader must take the following positions in three options with different strikes and the same maturity dates:

Long Call 1 with strike of 6000 and premium paid Rs. 230
Short Call 2 with strike of 6100 and premium received Rs. 150
Long Call 3 with strike of 6200 and premium paid of Rs. 100
Short Call 2 with strike of 6100 and premium received Rs. 150

Let us see what happens if on the expiry the stock price is:

- Less than or equal to 6000
- Equal to 6100
- More than or equal to 6200

Case I: Price at 6000

Long Call 1: -230
Short Call 2: 150
Long Call 3: - 100
Short Call 2: 150
Net Position: -230 + 150 – 100 + 150 = -30

For any price lower than 6000, all calls will be out-of-the-money so nobody will exercise. Hence buyers will lose the premium and sellers/ writers will get to keep the premium. In all these situations, the trader's loss would be a flat Rs. 30.

Case II: Price at 6100

Long Call 1: - 230 – 6000 + 6100 = - 130
Short Call 2: 150
Long Call 3: - 100
Short Call 2: 150
Net Position: - 130 + 150 – 100 + 150 = 70

This is the maximum possible profit for this position. Both the short calls earn the premium for the trader. This entire premium is retained by the trader for all prices less than or equal to 6100.

Case III: Price at 6200 or higher

Long Call 1: - 230 – 6000 + 6200 = - 30 (This will keep increasing as price rises)

Short Call 2: 150 – 6200 + 6100 = 50 (This will start getting losses as price increases)

Long Call 3: - 100

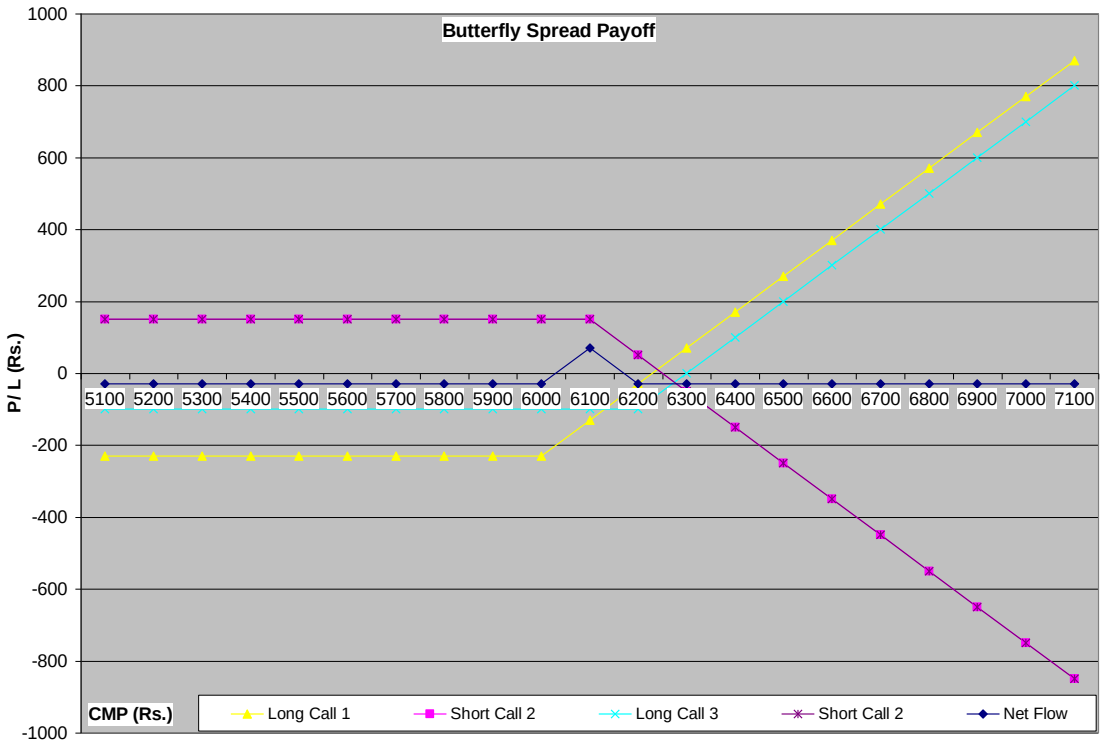
Short Call 2: 150 – 6200 + 6100 = 50 (This will start getting losses as price increases)

Net Position: - 30 + 50 – 100 + 50 = - 30

From 6200 or higher, the long calls will start making money for the trader whereas the short calls will be in losses. The net payoff of all 4 options would always be equal to –30. Following table and picture explain this position:

Option	Call	Call	Call	Call
Long/Short	Long	Short	Long	Short
Strike	6000	6100	6200	6100
Premium	230	150	100	150
Spot	6100			

CMP	Long Call 1	Short Call 2	Long Call 3	Short Call 2	Net Flow
5100	-230	150	-100	150	-30
5200	-230	150	-100	150	-30
5300	-230	150	-100	150	-30
5400	-230	150	-100	150	-30
5500	-230	150	-100	150	-30
5600	-230	150	-100	150	-30
5700	-230	150	-100	150	-30
5800	-230	150	-100	150	-30
5900	-230	150	-100	150	-30
6000	-230	150	-100	150	-30
6100	-130	150	-100	150	70
6200	-30	50	-100	50	-30
6300	70	-50	0	-50	-30
6400	170	-150	100	-150	-30
6500	270	-250	200	-250	-30
6600	370	-350	300	-350	-30
6700	470	-450	400	-450	-30
6800	570	-550	500	-550	-30
6900	670	-650	600	-650	-30
7000	770	-750	700	-750	-30
7100	870	-850	800	-850	-30



Cost of creating butterfly spread: -230 + 150 – 100 + 150 = - 30

Lower BEP = 6000 + 30 = 6030

Higher BEP = 6200 – 30 = 6170

This position can also be created with the help of only puts or a combination of calls and puts. To create this position from puts, you need to buy one highest strike option, sell two middle strike options and then again buy one lowest strike option. And, to create this position from combination of calls and puts, you must buy one call at lowest strike, sell one call at middle strike, buy one put at highest strike and sell one put at middle strike. This is a limited profit and limited loss strategy.

Hedging with options:

Options are known for providing an insurance against unexpected movements in the underlying price. If an investor has plans to buy a stock at some date in the future, buying a call option on the stock enables him to lock in the purchase price for the stock today. Thus, the investor is protected against a surprise rally in the stock price. Hence, buying a call option enables the call holder to 'insure' against large and surprise upside movement in the stock price.

For example, suppose that an investor expects to receive some money from a maturing fixed deposit at the end of the month and plans to buy 1500 shares of a company at that time. The risk faced by the investor is that the stock price might rise a lot by end of the month, making it difficult for him to buy the planned number of shares. The investor can

protect himself from the risk of a rally in the stock price by buying a call option on the stock today. Suppose that the stock price today is Rs.463 and the investor buys a near-month call option with a strike price of 460 at a premium of Rs.19. Now suppose that the stock price on the expiry date has risen to Rs.520. In this case, the rise in the call premium would compensate the investor for the rise in the stock price. However, if the stock price falls to Rs.430 on the expiry date, the investor would buy the stock at the market price which is cheaper than exercising the option. In this way, buying a call option protects the investor from a sudden rise in the price of the stock that he is planning to buy in the future.

Similarly, buying a put option enables an investor to protect his portfolio against unexpected downward movements in the underlying price.

Protective Put

This is a hedged position. Any investor, long in the cash market, always runs the risk of a fall in prices and thereby reduction of portfolio value and MTM losses. A mutual fund manager, who is anticipating a fall, can either sell his entire portfolio or he can short futures to hedge his portfolio. In both cases, he is out of the market, as far as profits from upside are concerned. What can be done to remain in the market, reduce losses but gain from the upside? Buy insurance!

By buying put options, the fund manager is effectively taking a bearish view on the market and if his view turns to be correct, he will make profits on the long put, which will be useful to wipe out the MTM losses in the cash market portfolio.

Let us say an investor buys a stock in the cash market at Rs 1600 and at the same time buys a put option with strike of 1600 by paying a premium of Rs 20.

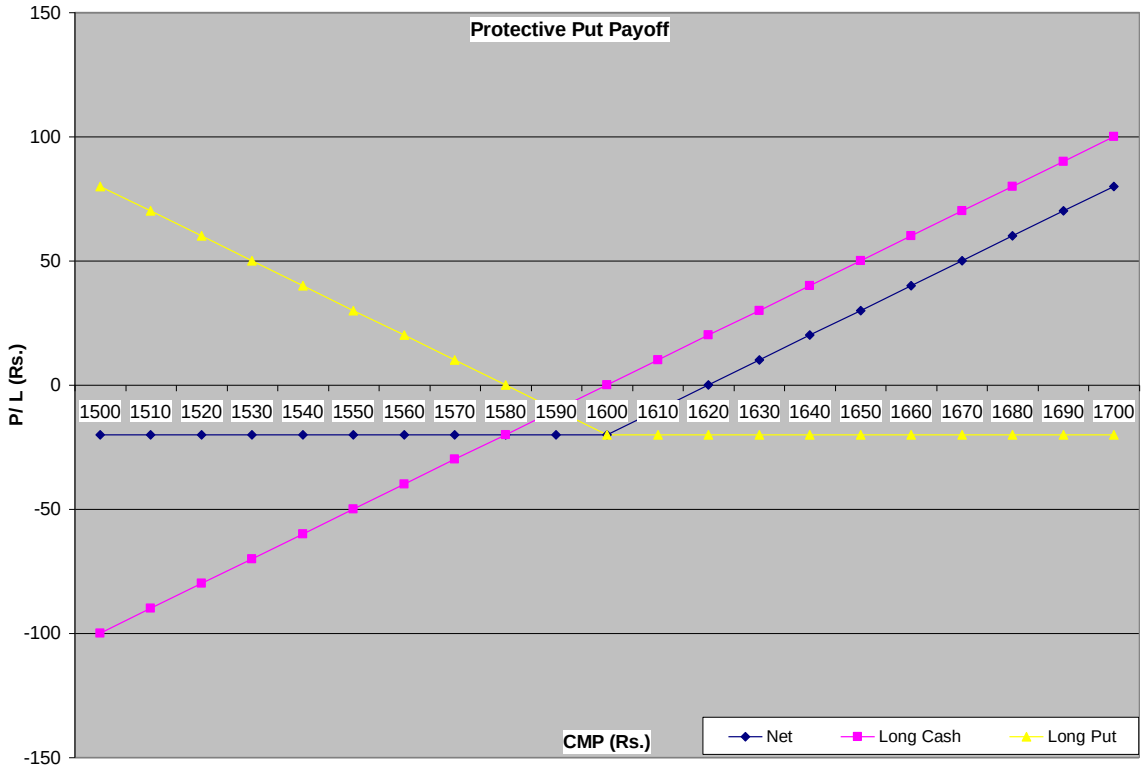
Now, if prices fall to Rs 1530 from here:
Long Cash: Loss of 70 (i.e., 1530 - 1600 = - 70)
Long Put: Profit of 50 (i.e., – 20 – 1530 + 1600 = 50)
Net Position: -20

For all falls in the market, the long put will be profitable, and the long stock position will be loss-making, thereby reducing the overall losses only to the extent of premium paid (if strikes are different, losses will be different from premium paid).
In case prices rise to 1660:
Long Cash: Profit of 60 (i.e., 1660 – 1600 = 60)
Long Put: Loss of 20
Net Position: 60 – 20 = 40

As the stock price keeps rising, the profits of the hedged position will keep rising. This is because while the maximum loss in the long put is equal to the premium paid, the profits in the long stock position keep increasing. The combined position would look like this:

Long Cash	1600
Strike Price	1600
Premium	20

CMP	Long Cash	Long Put	Net Flow
1500	-100	80	-20
1510	-90	70	-20
1520	-80	60	-20
1530	-70	50	-20
1540	-60	40	-20
1550	-50	30	-20
1560	-40	20	-20
1570	-30	10	-20
1580	-20	0	-20
1590	-10	-10	-20
1600	0	-20	-20
1610	10	-20	-10
1620	20	-20	0
1630	30	-20	10
1640	40	-20	20
1650	50	-20	30
1660	60	-20	40
1670	70	-20	50
1680	80	-20	60
1690	90	-20	70
1700	100	-20	80



A protective put payoff is similar to that of a long call. This is because a protective put position offers the scope of unlimited gains with a limited loss, which is also the payoff profile of a long call position. Hence the protective put is called a 'synthetic long call' position.

5.3 Arbitrage using options: Put-call parity

We have seen how it is possible to execute arbitrage strategies whenever the traded price of a futures contract deviates from its fair or theoretical price. In the same manner, arbitrage is possible whenever the traded price of an option deviates from its fair price. Such arbitrage is based on an important principle known as 'put-call parity'. It simply states the relationship between calls and puts with the same strike price and time to maturity. It can be stated as below:

$$c + X * e^{-rt} = p + S_0$$

In this formula, c and p denote the premium for the call and put options, X is the strike price of the options, S_0 is the spot price of the underlying, r is the rate of interest and t is the time to expiry of the options.

What this formula means is that if we know the price of the underlying stock or asset and also the price of a call option on this asset, we can derive the 'fair' or 'theoretical' price of a put option on the same underlying asset having the same strike price and expiry date as

the call option. Further, if the traded price of the put option is different from this derived fair price, there is an arbitrage opportunity to make a risk-free profit. Note that the put-call parity principle is only applicable to European options.

For example, suppose that a stock is trading at Rs.1251 and a call option with a strike price of Rs.1240 and expiring after 1 month is quoting at Rs.47.50. Assume that the interest rate is 8% p.a. What should be the fair price of a one-month put option on the stock with the same strike price?

Substituting the numbers in the put-call parity formula, we can derive the fair price of the put option as Rs.28.26. Now suppose that the put is being traded in the market at Rs.23.15. It means that the put is underpriced, thus creating an arbitrage opportunity. What will the arbitrageur do?

The arbitrageur will buy the put and the stock, (paying out Rs.23.15 and Rs.1251) and simultaneously short the call option for Rs.47.50. This leaves him with a net cash outflow of Rs.1226.65 (=1251+23.15-47.50). Assume that the arbitrageur can borrow this amount at 8% p.a.

Now, suppose that the stock rises to Rs.1275 on expiry date. The arbitrageur will sell the shares held by him for Rs.1275. The put bought by him will expire worthless. The short call position will be in-the-money and lead to a loss of Rs.35 for the arbitrageur. The borrowing will grow to Rs.1234.86 (=1226.65*exp(0.08*1/12)) and will have to be repaid. The net cash inflow will thus be 1275-35-1234.86 = Rs.5.14, which is equal to the difference between the fair price and traded price of the put.

If the stock falls to Rs.1200 on the expiry date, the short call will expire worthless. The arbitrageur will sell his stock at Rs.1200, but the long put will result in a payoff of Rs.40. After repayment of borrowing of Rs.1234.86, the arbitrageur will again be left with a net gain of Rs.5.14.

The above example shows how the principle of put-call parity can be used to find arbitrage opportunities between call and put options on the same underlying stock and having the same strike price and expiry dates. However, these strategies are difficult to execute, because they involve the simultaneous buying and selling of the stock, the put and the call. Any delay in executing one leg of the strategy will lead to the arbitrageur not being able to capture the anticipated arbitrage gain. Also, if the arbitrageur is unable to execute one leg of the transaction after the other leg has already been executed, he will be left with a naked long or short position, which can expose him to large losses.

5.4 Delta-hedging

We have discussed briefly about option greeks in Unit 4. Remember that the delta of the option measures the sensitivity of the option value to a given small change in the price of

the underlying asset. Hence, if the delta of a call option is 0.6, it means that a change of Rs 1 in the underlying stock price will lead to a change of Rs 0.60 in the price of the option. Option traders use the concept of delta to hedge their portfolio of option positions. This will be clear from the following example.

Suppose that a stock is trading at Rs.100 and a trader takes a short position in 10 ATM call options on this stock. Assume that the options have a lot size of 50. Now suppose that the delta of this call option is 0.50. It means that a one rupee change in the stock price will cause the call price to change by 50 paise.

Since the trader has sold the calls, he is at risk from a rise in the stock price. To hedge this risk, the trader must go long in the underlying stock. But what should be the size of the long stock position? This is decided based on the option delta. If the stock price moves up by 1 rupee, the loss on the trader's short call position would be 0.50*50*10 = Rs 250. The trader's long position in stock futures should compensate for the loss in the option position.

Remember that a stock futures contract has a delta of roughly one, because the futures price goes hand in hand with the spot price. As the lot size is 50, it means that the trader must go long in 5 futures contracts. Since the delta of a futures contract is equal to one, the long position in 5 lots of futures has a delta of 1*5*50 = 250. The delta of the 10 lots of short call is -0.5*10*50 = -250. Hence the delta of the combined position (short call and long futures) is equal to zero. This position is called a 'delta-neutral' position. What this means is that the combined position of short 10 lots of calls and long 5 lots of futures contracts is not affected by any small changes in the stock price. The key word here is 'small' changes.

The option delta changes with any change in the price of the underlying stock. So, if the stock price rises from 100 to 110, the call delta may rise from 0.50 to 0.60. In that case, the trader will need to increase his long position in futures so as to keep the portfolio delta-neutral. He will now have to go long in one more lot of futures so that the long futures position is now 6 lots. This will again make the combined position delta-neutral.

In this way, the trader must keep buying or selling futures contracts in order to maintain the delta of the combined position near zero. This process is known as 'delta hedging'. It is the option trader's way of managing the risk of his short option position.

5.5 Interpreting open interest and put-call ratio for trading strategies

Before we end this chapter, let us understand some basic terms associated with futures and options and how these can be used for deciding a trading strategy.

Open Interest: This refers to the number of positions that have been opened by market participants and not yet closed. For example, if the May index futures contract has an

open interest of 2,56,000 contracts, it means that market participants have bought or sold 2,56,000 contracts till date and all these positions are yet to be closed.

5.5.1 New Formulation of Open Interest (OI)

Open Interest (OI) is now measured at a portfolio level by computing the net Delta-adjusted open positions across futures and options for an underlying. This will lead to Future markets mirroring underlying markets.

We have discussed option greeks in Unit 4 briefly. You can recall that the Delta indicates the sensitivity of a derivative's price movement relative to its underlying asset. The details of delta value for futures and options are as follows:

Position	**Delta Value**	**Delta Value Interpretation**
Long Futures	+1	Gains ₹ 1 for every ₹ 1 rise in underlying asset
Short Futures	-1	Loses ₹ 1 for every ₹ 1 rise in underlying asset
Long Call	0 to +1	Partial gain when underlying asset rises
Short Call	0 to -1	Partial loss when underlying asset rises
Long Put	0 to -1	Partial gain when underlying asset falls
Short Put	0 to +1	Partial loss when underlying asset falls

The new formulation of OI introduced by SEBI aim to enhance both risk management and trading convenience in the equity derivatives.

Example for the calculation of Future Equivalent Open Interest (FutEq OI) for F & O

Scrip 1	Long Position in Futures	Long Position in Call	Delta of long Call	Long Position in Put	Delta of long Put	Short Position in Put	Delta of Put	Short Position in Call	Delta of Call	Notional OI	FutEq OI
Client 1	300									300	300
Client 2		500	0.5							500	250
Client 3	300	500	0.5	400	-0.5					1200	350
Client 4						-400	-0.5	-400	0.5	800	0
Market wide OI										**2800**	**900**

As mentioned in the above table, we used to calculate notional OI for Client 2 as 500 earlier but it will be FutEq OI now by multiplying delta value of 0.5 with long position in call of 500 i.e. 500*0.5 = 250. Similarly, FutEq OI of other scrips will be calculated. For

overall portfolio, Market wide OI decreased to 900 as per new FutEq OI calculation in comparison to 2800 which is as per Notional OI calculation (Old). It will align equity futures and options market more closely with cash market and strengthen the risk management. You may see the SEBI Circular[5] for more details.

5.5.2 Put Call Ratio

Total Traded Quantity or traded volume: This is the total number of contracts that have been traded or changed hands during the day. If the traded volume of May index futures today is 2,00,000 contracts, it refers to the number of contracts traded today.

Put-call ratio: This is the ratio of trading volume of put options to call options. The ratio is calculated either on the basis of options trading volumes or on the basis of their open interest.

Traders can decide whether to buy or sell futures based on changes in the open interest and the futures price. There are four possible scenarios and the trading strategy would differ accordingly:

1. If the futures price is rising and open interest of the futures contract is also increasing, it signals a bullish trend. Traders usually prefer to go long the futures in such situations.

2. If the futures price is rising but open interest is declining, it indicates short-covering. It usually indicates that existing short positions are being squared up.

3. If the futures price is declining but open interest is increasing, it indicates a build-up of short positions and a bearish trend. Traders usually tend to go short on the futures in such a scenario.

4. If the futures price is declining and open interest is also declining, it usually means that existing long positions are being squared up.

Traders also consider the changes in the put-call ratio for deciding their option trading strategy. If the put open interest for an index options contract is 8000 and the call open interest is 12000, the put-call ratio is computed as:

$$PCR = 8000/12000 = 0.67.$$

The put-call ratio is generally treated as a contrarian indicator. If the PCR is less than one, it means that the open interest of calls exceeds that of puts. It also means that option traders prefer to sell more calls than puts. This indicates that option sellers do not expect the index to rise in the near future. Thus, a PCR less than one signals a bearish trend. A PCR greater than one, say 1.25, means that the open interest of puts is higher than that of calls. This is taken as a bullish signal, because it shows that option sellers do not expect a fall in the market.

[5] SEBI Circular Ref.: SEBI/HO/MRD/TPD-1/P/CIR/2025/79 Dated May 29, 2025

Sample questions

1. If an investor buys a call option with lower strike price and sells another call option with higher strike price, both on the same underlying share and same expiration date, the strategy is called _____.
(a) **Bullish spread**
(b) Bearish spread
(c) Butterfly spread
(d) Calendar spread

2. Which of the following is a hedged position?
(a) Short straddle
(b) Short strangle
(c) Covered call
(d) **Protective put**

3. Put-call parity refers to the relationship between: _____.
(a) futures and options on the same stock
(b) call options on the same stock with the same maturity but different strike prices
(c) put and call options on the same stock but different strike prices and different maturity
(d) **call and put options on the same stock with the same strike prices and same maturity**

4. Which of the following situations indicates a bullish trend in the underlying?
(a) a rising futures price along with falling open interest
(b) a falling futures price along with rising open interest
(c) **a rising futures price along with rising open interest**
(d) a falling futures price along with falling open interest

CHAPTER 6: TRADING MECHANISM

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Trading Mechanism for futures and options
- Entities involved in the trading of futures and options
- Different types of orders and order matching rule
- Selection criteria of stocks and index for futures and option trading
- Adjustment for Corporate Actions
- Trading costs
- Algorithmic trading
- Tracking of futures and options data

6.1 Trading Mechanism

In this chapter we shall take a brief look at the trading mechanism of futures and options on exchanges, including various types of orders. However, the best way to develop an understanding of the trading mechanism is to watch the screen and observe trading.

As stated earlier, futures and options are standardized contracts and like shares, they are traded on exchanges. Markets around the world can be classified into two main types based on the methods of booking a trade namely an "open outcry" market and the "electronic" market. Open outcry is the way of communication between professionals on an exchange, which involves shouting, or using hand signals to transfer information about buy and sell orders. In an open outcry market, the trading takes place in a large hall known as "pit" where members are present and contracts are traded through continuous bids and offers. Thus, such a market brings together the buyers and sellers (through their brokers) on a platform for trading. In case of electronic trading, there are screen-based broker dealing terminals, instead of the trading pit. Futures and options trading in India are electronic in nature, with the bids and offers, and the acceptance being displayed on the terminal continuously.

All the derivatives exchanges in India provide a fully automated screen-based trading platform for index futures, index options, stock futures and stock options. These trading systems support an order driven market and simultaneously provide complete transparency of trading operations. Derivative trading is similar to that of trading of equities in the cash market segment.

All these exchanges have developed software for the F&O market to facilitate efficient and transparent trading in futures and options instruments.

Entities involved in the trading of futures and options

Trading Member: They are members of Stock Exchanges. They can trade either on behalf of their clients or on their own account. The exchange assigns a trading member ID to each of its trading member. A trading member can have more than one user.

The number of users allowed for each trading member is decided by the exchange from time to time. A user must be registered with the exchange where he is assigned a unique user ID.

The unique trading member ID is common for all the users of a particular trading member. Therefore, it functions as a reference for all users of a particular trading member. Trading member is responsible for maintaining adequate control over persons having access to the firm's User IDs.

Trading cum Clearing Member: This is a Clearing Member (CM) who is also a Trading Member (TM) of the exchange. Such CMs may clear and settle their own proprietary trades, their clients' trades as well as trades of other Trading Members and Custodial Participants.

Professional Clearing Member: A Professional clearing member clears the trades of his associate Trading Member and institutional clients. A PCM is not a Trading Member of the exchange. Typically banks or custodians become a PCM and clear and settle for Trading Members as well as for Custodial Participants.

Self Clearing Member (SCM): A Self Clearing Member is also a Trading Member on the exchange. Such CMs may clear and settle only their own proprietary trades and their clients' trades but cannot clear and settle trades of other Trading Members.

Participants: A participant is a client of a trading member. Clients may trade through various trading members but settle through a single clearing member.

Authorised Persons (APs): SEBI had earlier allowed spread of sub-brokership as well as Authorised Person's network to expand the brokers' network. However, SEBI Board in its meeting held on June 21, 2018 decided that sub-brokers as an intermediary shall cease to exist with effect from April 01, 2019. All existing sub-brokers would migrate to become Authorised Persons (APs) or Trading Members if the sub-brokers meet the eligibility criteria prescribed under Stock Exchange bye-laws and SEBI Regulations and by complying with these Regulations.

Market Timing of Derivative segment

Trading on the derivatives segment takes place on all working days of the week between 9:15 am and 3:30 pm. SEBI, with a view to enable integration of trading of various segments of securities market at the level of exchanges, has permitted Stock Exchanges to set their trading hours in the Equity Derivatives Segment between 9:00 AM and 11:55 PM, provided that the Stock Exchange and its Clearing Corporation have in place risk management system and infrastructure commensurate to the trading hours.

Corporate Hierarchy

In the Futures and options trading software, trading member will have a provision of defining the hierarchy amongst users of the system. This hierarchy comprises:

- Corporate Manager
- Branch Manager and
- Dealer

Corporate Manager: As a user, it is the highest level in a trading firm. Corporate Manager 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. Along with this he can also define exposure limits for the branches of the firm. This facility is available only to the corporate manager.

Branch Manager: As a user, it is placed under the corporate manager. Branch Manager can perform and view order and trade related activities for all dealers under that branch.

Dealer: Dealer is at the lowest level of the user hierarchy. He can only view his own orders and trades and does not have access to information on other dealers under either the same branch or in other branches.

Client Broker Relationship

A trading member is responsible for various compliance related activities including Know Your Client (KYC) form, execution of Client Broker agreement, timely execution of orders given by clients, collection of adequate margins, maintain separate client bank account for segregation of client money, ensure timely pay-in and pay-out of funds, timely issue of contract notes, resolve clients' complaints, sending periodical statement of accounts, maintain unique client code, etc.

Order types and conditions

In the trading system, trading members are allowed to enter orders with various conditions attached to them as per their requirements. These conditions are broadly divided into the following categories:

- Time conditions

- Price conditions
- Various combinations of the above are allowed providing flexibility to the users.

Time conditions

Day order: A Day order is an order which is valid for a single day on which it is entered. If the order is not executed during the day, the trading system cancels the order automatically at the end of the day.

Immediate or cancel (IOC) order: A user is allowed to buy/sell a contract as soon as this order is released into the trading system. An unmatched order will be immediately cancelled. Partial order match is possible in this order, and the unmatched portion of the order is cancelled immediately.

Price condition

Limit order: It is an order to buy or sell a contract at a specified price. The user must specify this limit price while placing the order and the order gets executed only at this specified limit price or at a better price than that (lower in case of buy order and higher in case of a sell order).

Market order: A market order is an order to buy or sell a contract at the best bid/offer price currently available in the market. The price is not specified at the time of placing this order. The price will be the currently available price in the market i.e., a buy market order will get executed at the best price at which the seller is ready to sell and a sell market order will get executed at the best price at which the buyer is ready to buy.

Stop-loss order: A stop loss is an order to buy (or sell) a security once the price of the security climbed above (or dropped below) a trigger price. The stop-loss order gets activated when the trigger price is reached/crossed and enters the market as a market order or as a limit order, as defined at the time of placing this stop-loss order. To illustrate, suppose a trader buys ABC Ltd. shares at Rs 100 in expectation that the price will rise. However, prices start declining below his buy price, trader would like to limit his losses. Trader may place a limit sell order specifying a trigger price of Rs 95 and a limit price of Rs 92. The trigger price must be between last traded price and limit price while placing the sell limit order. Once the market price of ABC breaches the trigger price i.e. Rs 95, the order gets converted to a limit sell order at Rs 92. (Trigger Price is the price at which the order gets triggered from the stop loss book.)

Order Matching Rules

In India, F&O platforms offer an order driven market, wherein orders match automatically on price time priority basis.

Orders, as and when they are received, are first time stamped and then immediately processed for potential match. 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.

The best buy order will match with the best sell order. An order may match partially with another order resulting in multiple trades. For order matching, the best buy order is the one with highest price and the best sell order is the one with lowest price. This is because the computer views all buy orders available from the point of view of a seller and all sell orders from the point of view of the buyers in the market.

Price Band

There are no price bands applicable in the derivatives segment. However, in order to prevent erroneous order entry, operating ranges and day minimum/maximum ranges are kept as below:

- For Index Futures: at 10% of the base price
- For Futures on Individual Securities: at 10% of the base price
- For Index and Stock Options: A contract specific price range based on its delta value is computed and updated daily.

In view of this, orders placed at prices which are beyond the operating ranges would reach the Exchange as a price freeze.

SEBI has enhanced the criteria of Dynamic Price Bands for scrips in the Derivative Segment via circular dated May 24, 2024. This circular has defined the criteria for flexing the price bands in the Equity Derivatives Market. The key changes are as follows:

1. **Tighter Rules for Price Band Flexing**
    - Previously, price bands could be increased if **25 trades** happened at a certain price with **5 unique traders** on both sides.
    - Now, it will require **50 trades, 10 unique traders, and 3 brokerage firms** on each side before the price band can be adjusted.
2. **Price Bands Will Move Together Across Markets**
    - If a stock's price band is adjusted in the cash market (regular stock trading) or in the futures market, the price bands for **all futures contracts of that stock will also change at the same time**.
3. **More Cooling-off Time Before Further Price Changes**
    - If a stock keeps hitting the limit, the **time before the next price band increase will be longer**:

        - **First two increases:** 5% rise after a **15-minute** break (**5 minutes if near market close**).
        - **Next two increases:** 3% rise after **30 minutes**.
        - **Further increases:** 2% rise after **60 minutes**.

4. **Sliding Price Bands (No More One-Sided Adjustments)**
    - If a price band moves **upward**, the **lower price limit also moves up**, preventing extreme one-sided price movements.
    - Example: If a stock started with a price range of ₹90 - ₹110 and the upper band moves to ₹115, the lower band will also shift **up to ₹95**.
5. **Temporary Price Limits for Options Trading**
    - When a stock hits a price limit and enters a **cooling-off period**, options traders will have **temporary limits** based on the **latest price** or a calculated value.

Once the cooling-off period ends, options will trade freely again. These above new rules are designed to:

✅ Reduce **sudden price jumps** caused by big orders or mistakes.

✅ Prevent **market manipulation** by a small group of traders.

✅ Give traders **more time to react** to price changes.

✅ Make price movements **smoother and more predictable**.

These changes will make the market **fairer, more stable, and better protected against excessive volatility**.

The Trader Workstation

The 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
- Toolbar
- Market watch window
- Inquiry window

- Snap quote
- Order/trade window
- System message window

The best way to familiarize oneself with the screen is to spend some time studying a live screen.

Placing orders on the trading system

While entering orders on the trading system for both the futures and the options market, trading member are required to identify orders as being proprietary or clients. 'Pro' identifies proprietary orders while 'Cli' identifies client orders. Client account number should be provided for client orders.

Futures and Options Market Instruments

The F&O segment of the derivatives exchanges provides trading facilities for the following derivative instruments:

- Index based futures
- Index based options
- Individual stock options
- Individual stock futures

6.2 Eligibility criteria for selection of stocks for derivatives trading

The stock selection criteria for derivatives trading in India ensure that the stock is large in terms of market capitalization, turnover and has sufficient liquidity in the underlying market and there are no adverse issues related to market manipulation.

Eligibility criteria of stocks

A stock on which stock option and single stock futures contracts are proposed to be introduced shall conform to the following broad eligibility criteria for a continuous period of six months:

a) The stock shall be chosen from amongst the top 500 stocks in terms of average daily market capitalization and average daily traded value in the previous six months on a rolling basis.
b) The stock's median quarter-sigma order size (MQSOS) over the last six months, on a rolling basis, shall not be less than Rs 75 Lakhs.
c) The market wide position limit (MWPL) in the stock shall not be less than Rs 1500 crores on a rolling basis, and
d) Average daily delivery value in the cash market shall not be less than Rs 35 crores in the previous six months on a rolling basis.

e) Stocks which meet the eligibility criteria in the underlying cash market of any stock exchange would be permitted to trade in equity derivatives segment of all stock exchanges.

If an existing security fails to meet aforesaid continued eligibility criteria for three months consecutively, then no fresh month contract shall be issued on that security. However, the existing unexpired contracts may be permitted to trade till expiry and new strikes may also be introduced in the existing contract months. Once a stock is excluded from the derivatives segment, it shall not be considered for re-inclusion for a period of one year from its last trading day in the derivatives segment.

6.2.1 Exit norms based on introduction of a Product Success Framework (PSF) for stock derivatives

On similar lines as the extant PSF for index derivatives, it has been decided to introduce additional exit criteria for stocks from the derivatives segment, by introducing PSF for single stock derivatives also. The criteria for the said PSF framework are as follows:

I. At least 15% of trading members active in all stock derivatives (trading member who has traded during the month) or 200 trading members, whichever is lower, shall have traded in any derivative contract on the stock being reviewed on an average on monthly basis during the review period.
II. Trading on a minimum of 75% of the trading days during the review period.
III. Average daily turnover single sided (futures + options premium) of at least INR 75 crores during the review period.
IV. Average daily notional open interest single sided (futures + options notional) of at least INR 500 crores during the review period.

The above-mentioned criteria for exit shall apply to only those stocks which have completed at-least 6 months from the date of introduction. After the said gestation period, the stocks failing to meet the above eligibility criteria (PSF) shall exit from derivatives segment in the upcoming review cycle. In such cases, no fresh month contract shall be issued on that stock. However, the existing unexpired contracts may be permitted to trade till expiry and new strikes may also be introduced in the existing contract months. A stock will exit from derivatives segment if it fails in meeting eligibility criteria across all exchanges based on performance in the underlying cash market. If a stock is meeting the eligibility criteria on any exchange, it will continue to be eligible for derivatives segment on all Exchanges.

Re-introduction of excluded stocks:

A stock which is excluded from derivatives trading may become eligible once again. In such instances, the stock is required to fulfill the eligibility criteria for six consecutive months to be re-introduced for derivatives trading.

6.3 Selection criteria of Index for trading

Eligibility criteria of Indices

The Exchange may consider introducing derivative contracts on an index, if weightage of constituent stocks of the index, which are individually eligible for derivatives trading, is at least 80%. However, no single ineligible stock in the index shall have a weightage of more than 5% in the index. The index on which futures and options contracts are permitted shall be required to comply with the eligibility criteria on a continuous basis. The Exchange shall check whether the index continues to meet the aforesaid eligibility criteria on a monthly basis. If the index fails to meet the eligibility criteria for three consecutive months, then no fresh contract shall be issued on that index. However, the existing unexpired contracts shall be permitted to trade till expiry and new strikes may also be introduced in the existing contracts.

The product success framework is applied to all index derivatives (except for the flagship indices of the exchanges) at the underlying level. The criteria for evaluation of the index derivatives are as follows:

- 15% of trading members active in all index derivatives or 20 trading members whichever is lower should have traded in any derivative contract on the index being reviewed in each of the month during the review period,
- Trading on a minimum of 75% of the trading days during the review period,
- Average daily turnover of at least INR 10 crore during the review period, and
- Average daily open interest of INR 4 crore during the review period

Once an index is excluded from the derivatives list, it shall not be considered for re-inclusion for a period of at least six months. Exchanges may consider re-launching derivative contracts on the same index after carrying out suitable modification(s) in contract specifications based on market feedback, after a cooling off period of at least six months, subject to SEBI approval.

Surrogate / Pseudo index - In the context of financial markets and specifically equity derivatives, a surrogate or pseudo index is an alternative index used when the primary index under review doesn't meet all the criteria for derivatives trading, but a similar index in another exchange does.

Purpose of Surrogate / Pseudo Index - If an index used for equity derivatives (like options or futures) fails a review process, the exchange may still allow derivatives on that index if a "surrogate" or "pseudo" index exists elsewhere that meets the necessary criteria.

Conditions for a Surrogate/Pseudo Index:

a. The number of constituents in the smaller index (the surrogate) should be at least 80% of the larger index.
b. At least 50% of the constituent stocks in the larger index should also be part of the smaller index.
c. The correlation between the two indices should be at least 0.90 for the previous 6 months on a rolling basis.

An index in an exchange shall have only one pseudo/surrogate index per exchange.

6.4 Adjustments for Corporate Actions

Adjustments for Corporate Actions for Stock Options would be as follows:

1. The basis for any adjustment for corporate action shall be such that the value of the position of the market participants on cum and ex-date for corporate action shall continue to remain the same as far as possible. This will facilitate in retaining the relative status of positions viz. in-the-money, at-the-money and out-of-money. This will also address issues related to exercise and assignments.
2. Adjustments shall mean modifications to positions and/or contract specifications as listed below such that the basic premise of adjustment laid down above is satisfied:
    a) Strike Price
    b) Position
    c) Market Lot/Multiplier
3. Any adjustment for corporate actions shall be carried out on the last day on which a security is traded on a ‘cum’ basis in the underlying cash market, after the close of trading hours.

The adjustments shall be carried out on any or all of the above based on the nature of the corporate action. The adjustments for corporate actions shall be carried out on all open positions.

The corporate actions may be broadly classified under stock benefits and cash benefits:

- Bonus
- Rights
- Merger/De-merger
- Amalgamation

- Splits
- Consolidations
- Hive-off
- Warrants
- Secured Premium Notes (SPNs)
- Extraordinary dividends

Following elaborates the adjustment for Bonus, Stock splits, consolidation and extraordinary dividends

Bonus, Stock Splits and Consolidations

Strike Price: The new strike price shall be arrived at by dividing the old strike price by the adjustment factor as under.

Market Lot / Multiplier: The new market lot/multiplier shall be arrived at by multiplying the old market lot by the adjustment factor as under.

Position: The new position shall be arrived at by multiplying the old position by the adjustment factor as under.

The adjustment factor for Bonus, Stock Splits and Consolidations is arrived at as follows:

Bonus

Ratio – A: B

Adjustment factor: (A+B)/B

Stock Splits and Consolidations

Ratio – A: B

Adjustment factor: A/B

Rights

Number of Existing shares = A

Rights Entitlement (Rights to subscribe) = B

Total Entitlement = A+B

Underlying close price on the last cum date = P

Issue price of the rights = S

Benefits per share = E

Benefit per Right Entitlement = (P – S)

Benefit per share (E) = (P-S)/(A+B)

Adjustment Factor is = (P-E)/P

Dividend if any, declared by the company along with rights shall be adjusted as per the prevailing dividend adjustment policy in F&O Segment.

The above methodology may result in fractions due to the corporate action e.g. a bonus ratio of 3:7. With a view to minimizing fraction settlements, the following methodology is proposed to be adopted:

(a) Compute value of the position before adjustment
(b) Compute value of the position taking into account the exact adjustment factor
(c) Carry out rounding off for the Strike Price and Market Lot
(d) Compute value of the position based on the revised strike price and market lot

The difference between (a) and (d) above, if any, shall be decided in the manner laid down by the group by adjusting Strike Price or Market Lot, so that no forced closure of open position is mandated.

Dividends

Dividends which are below 2% of the market value of the underlying stock would be deemed to be ordinary dividends and no adjustment in the strike price would be made for ordinary dividends. For extra-ordinary dividends, above 2% of the market value of the underlying stock, the Strike Price would be adjusted.

For extra-ordinary dividends above 2% of the market value of the underlying security, all positions in existing strike prices shall continue to exist in the corresponding new adjusted strike prices for respective option contracts. All open positions shall be carried forward at the daily settlement price less dividend amount for the respective futures contract.

- To decide whether the dividend is "extra-ordinary" (i.e. at or above 2% of the market price of the underlying stock.), the market price would mean the closing price of the stock on the day previous to the date on which the announcement of the dividend is made by the Company after the meeting of the Board of Directors. However, in cases where the announcement of dividend is made after the close of market hours, the same day's closing price would be taken as the market price. Further, if the shareholders of the company in the AGM change the rate of dividend declared by the Board of Directors, then to decide whether the dividend is extra-ordinary or not would be based on the rate of dividend communicated to the exchange after AGM and the closing price of the stock on the day previous to the date of the AGM.
- In case of declaration of "extra-ordinary" dividend by any company, the total dividend amount (special and / or ordinary) would be reduced from all the strike prices of the option contracts on that stock.

- The revised strike prices would be applicable from the ex-dividend date specified by the exchange.

Merger / Demerger

On announcement of the record date for merger/demerger, the last cum-date for merger/demerger would be determined by the Exchange/ Clearing Corporation. The date of expiration of all contracts in the underlying which shall cease to exist subsequent to the merger/demerger, shall be the last cum date, which shall be informed to the members.

- Pursuant to the announcement of the record date, no fresh month contracts on Futures and Options would be introduced in the underlying which shall cease to exist, subsequent to the merger/demerger.
- Un-expired contracts in the underlying, which shall cease to exist subsequent to the merger/demerger, outstanding as on last cum-date shall be compulsorily settled at the settlement price. The settlement price shall be the last available closing price of such underlying in the Capital Market segment of the Exchanges, on the last cum-date.

6.5 Trading costs

A participant in the equity derivatives market incurs different trading costs which can be broadly classified into user charges, statutory charges and impact cost:

User charges: Brokerage is the commission charged by brokers who place the orders for their clients. Brokerage is usually lower for intra-day trades. Rates of brokerage differ widely according to the additional services offered by the broker. Just as brokers charge brokerage from their clients, the stock exchanges also collect transaction charges from brokers who are the members of the exchange.

Statutory charges: These include the Securities Transaction Tax (STT), Goods and Services tax (GST), Stamp Duty and SEBI Turnover fees and applicable GST on it.

The STT rates currently applicable to the Equity Derivatives segment are as follows:

Taxable securities transaction	Rates	Payable by
Sale of an option in securities	0.10 per cent	Seller – on the option premium
Sale of an option in securities, where option is exercised	0.125 percent	Purchaser – on the settlement price
Sale of a futures in securities	0.02 per cent	Seller – on the price at which such futures is traded

Transaction Charges - Transaction charges are fees levied on trades conducted through stock exchanges. The exchanges have specified structures for these charges, which vary depending on the type of trade, such as equity, futures, or options. Transaction charges are levied on both the buy and sell sides of the transaction. For options, they are charged on the premium. One should always refer to the respective exchange notifications/circulars to ascertain prevalent transaction charges.

IPFT Charges – The IPFT (Investor Protection Fund Trust) is created by the stock exchanges to make up for investors' claims when defaulters' trading member assets are not enough to cover the Investor claims. This fund also focuses on promoting investor education, awareness, and research. One may visit the respective exchange website to ascertain the current IPFT charges as the same is subject to change. The IPFT charges for NSE are as follows:

Segment	**Charges**
NSE Equity and NSE futures	₹10 per crore of traded value + 18% GST
NSE Equity options	₹50 per crore of premium value for NSE Equity options + 18% GST

Goods and Services Tax (GST) is charged at 18 percent on brokerage plus the transaction charges. Both STT and GST are collected by the Central government. Stamp duty is charged at 0.002% (Rs.200 per crore) for buyers of equity futures and at 0.003% (Rs.300 per crore) for buyers of equity options. SEBI turnover fees are charged at Rs.10 per crore plus applicable GST.

Bid-ask spread and Impact cost:

These are not actually paid by market participants. These costs arise because of market imperfections or lack of liquidity. The result is that buyers who place orders to buy at the market price instead of placing limit orders end up paying higher prices. Similarly, sellers who place orders to sell at the market price instead of limit orders, receive lower prices. Consider an order book with the following buy and sell orders for the option on a stock.

Qty	**Bid**	**Ask**	**Qty**
19,950	16.60	16.80	2,850
5,700	16.55	16.85	5,700
11,400	16.50	16.90	2,850
5,700	16.45	16.95	5,700
2,850	16.40	17.00	8,550

The best buy price is Rs.16.60 while the best sell price is Rs.16.80. If some investor is in a hurry to buy the option, he will have to buy it at the ask price of 16.80. Similarly, an investor who wants to immediately sell an option or square off his long position, will receive the bid price of 16.60. An investor who buys the option at a premium of Rs.16.80 and immediately squares up the position at 16.60 would incur a loss of Rs.0.20 per lot. This gap between the bid and ask prices is known as the bid-ask spread. The bid-ask spread tends to be larger for illiquid stocks which have lesser participation by traders. Impact cost is a measure of the cost incurred due to the bid-ask spread. Again, the larger the bid-ask spread, larger would be the impact cost.

Example: Cost of trading

Suppose a trader takes a short position of 1 lot of index futures at the futures price of 17500. The lot size is 50. Hence the contract value is 1*50*17500, i.e., Rs.8,75,000. The various costs associated with this trade are shown in the table below:

1	**Contract value**	**8,75,000.00**
2	Brokerage @ 0.03%	262.5
3	STT @ 0.02%	175
4	Exchange fees @ 0.002%	17.5
5	SEBI charges @ Rs.10 per crore	0.88
6	IPFT charges @ Rs.10 per crore	0.88
4	GST @ 18% on (2+4+5+6)	50.72
	Total trading cost	**507.47**

*All the above charges are in INR.

Note that the brokerage charges (0.03%) are only illustrative. Most brokers today charge brokerage at a flat rate per order. Stamp duty is not considered in the above example as it is only charged on the buy-side of the transaction.

6.6 Algorithmic trading

Algorithmic trading is a process of executing orders utilizing automated and pre-programmed trading instructions to account for variables such as price, timing and volume. An algorithm is a set of directions for solving a problem. It is basically a mathematical model developed by programmers and is fed into a computer. The model considers the changing market conditions such as security prices, traded volumes, time of the day, etc. and dynamically places buy and sell orders in the market. The biggest advantage of algorithmic trading is that because placing of buy-sell orders is automatic and computer-driven, the individual trader's emotions are not allowed to affect his/her trading decisions. Another huge advantage is that algorithmic trading reduces the overall

time taken for order execution, because computers can place orders at far higher speeds than human operators sitting at trading terminals. High-frequency trading is an offshoot of algo trading which allows a trader to make tens of thousands of trades per second. Algo trading is mainly used by institutional investors and large brokers to cut down their trading costs.

It is observed that many unregulated platforms have started offering algorithmic trading services and strategies to investors for automated execution of their trades. In many cases, such platforms aggressively market their algo strategies promising a high return on investment to investors adopting such strategies. To prevent such mis-selling and to protect the interest of investors, SEBI has cautioned investors against dealing with such unregulated platforms. It has also directed brokers offering algo trading services (a) not to refer to the past or expected returns from such algo strategy and (b) not to associate with any algo platform that refers to the past or expected return from any algo strategy.

SEBI has introduced measures to strengthen controls around algo trading with brokers and exchanges for the safer participation of retail investors in algo trading.

The following regulatory frameworks[6] are being proposed with effect from Oct 01, 2025:

Key Terms

Application Programming Interface (API)	A set of rules and protocols that allows different software applications to communicate and exchange data with each other.
Static IP	A fixed IP address approved by the broker to avoid unauthorized access.
Open Authentication (OAuth)	A secure authorization framework that allows third-party applications to access user data without requiring users to share their login credentials or other sensitive information.
Two Factor Authentication (2FA)	Any user who is accessing API should have two layers of verification (e.g. password + OTP).
Algo ID	Exchange will assign a unique identifier to each registered algo for the purpose of surveillance.

[6] SEBI Circular Ref. No.: SEBI/HO/MIRSD/MIRSD-PoD/P/CIR/2025/0000013 Dated February 4, 2025 & SEBI/HO/MIRSD/MIRSD-PoD/P/CIR/2025/132 Dated September 30, 2025.

Kill Switch	An emergency function and the last level of defence against any Algorithm malfunction. It is expected to automatically trigger a halt on trading activity based on pre-defined conditions.

Particulars	Description
Orders per Second (OPS)	Low Frequency Algo (≤ 10 OPS) • Registration not required • Generic Algo ID High Frequency Algo (> 10 OPS) • Registration mandatory via broker • Unique exchange ID
User Eligibility	Allowed to share within family (self, spouse, dependent children and dependent parents only) with 2FA verification.
API Access	• Open APIs not allowed • Mapped to broker approved Static IP mapped to API key • Multiple API Keys allowed, segregate registered or unregistered algo
Security	• OAuth permitted only • Mandatory 2FA
Brokers' Role	• Deal with empanelled algo providers only • Due diligence before empanelment • Responsibilities of Surveillance • Brokers shall be solely responsible for handling investor grievances related to algo trading and the monitoring of APIs for prohibited activities. SEBI and Exchange will not entertain any complaint.

Categorization of Algos:

Parameter	Execution Algos or White box Algos	Black box Algos
Logic Disclosure	Disclosed to the user	Not known to the user
Replicability	Replicable by the user	Not replicable by the user
Transparency	Automated trading strategies/systems that execute orders based on fully transparent Algorithms.	User cannot see the internal workings and rationale of the Algo.

User Understanding	Decision making processes and underlying rules are accessible and understandable to users.	Not accessible to user
Registration	Not required to register	Algo provider must register as a Research Analyst.
Research Report	Not Mandatory	Maintain a research report for each algo.
Logic Change	Not treated as a new algo	Each change should be registered as new algo and confirmation to the exchange that the report has been maintained.

6.7 Tracking Futures and Options data

Prior to the surge in the popularity of internet trading, daily newspapers were the chief source of information regarding spot and derivatives prices.

The prices of both spot and F&O markets can now be tracked on a real-time basis on the websites of both exchanges as well as on online trading platforms of various brokers. In addition to the prices, the following details can be tracked by market participants:

Date: This gives the Trade date.

Symbol: This gives the underlying index or stock e.g. NIFTY, ACC, etc.

Instrument: This gives the contract descriptor for the various instruments available in the derivatives segment e.g. FUTSTK, OPTIDX, etc.

Expiry date: The date on which the contract expires

Option Type: This gives the type of option for the contract. (CE- Call European, PE- Put European, CA- Call American, PA- Put American)

Corporate Action level: This is the Corporate Action Flag. This flag changes when there is a corporate action on a contract, which could either be a symbol change or a dividend announced by the company.

Strike Price: This gives the Strike Price of the contract.

Opening price: This gives the price at which the contract opened for the day.

High price: This gives the highest price at which the contract was traded during the day. In a real-time context, it means the highest price at which the contract has been traded till that moment.

Low price: This gives the lowest price at which the contract was traded during the day. In a real-time context, it means the lowest price at which the contract has been traded till that moment.

Closing price: This gives the price of the contract at the end of the day.

Last traded price: This gives the price at which the last contract of the day was traded. In a real-time context, it reflects the price at which the last trade in that contract was executed till that moment.

Open Interest: For futures contracts open interest is equivalent to the open positions in that futures contract multiplied by its last available closing price. For option contracts, open interest is equivalent to the open positions multiplied by the notional value. Notional value with respect to an option contract is computed as the product of the open position in that option contract multiplied by the last available closing price of the underlying.

Total Traded Quantity: This is the total no. of contracts on which business took place during the day (or till that moment, in case of real-time data).

Total Traded Value: The total money value of the business which took place on the contract during the day (or till that moment, in a real-time context).

Number of Trades: The total no. of trades which took place on the instrument during the day (or till that moment, in a real-time context).

Information on trends in F&O markets:

- Positive trend: It gives information about the top gainers in the futures market.
- Negative trend: It gives information about the top losers in the futures market.
- Futures OI gainers: It lists those futures whose % increase in Open Interest is among the highest on that day.
- Futures OI losers: It lists those futures whose % decrease in Open Interest is among the highest on that day.
- Active Calls: Calls with high trading volumes on that particular day.
- Active Puts: Puts with high trading volumes on that particular day.
- Put/ Call ratio (PCR): It gives the information about the ratio of trading volume of put options to call options. The ratio is calculated either on the basis of options trading volumes or on the basis of their open interest.

6.8 Introduction of Investor Risk Reduction Access (IRRA) platform[7]:

The Investor Risk Reduction Access (IRRA) platform is designed to protect investors from technical glitches and unforeseen outages that can make a trading member's site inaccessible. It's intended to provide an alternative when both the primary trading platform and the disaster recovery sites are experiencing challenges. Salient features of this platform are outlined below:

- It is a joint platform developed by the exchanges to provide the investors an opportunity to square off/close the open positions and /or cancel pending orders in case of disruption of trading services provided by the Trading Member.
- The IRRA service shall support multiple segments across multiple exchanges.
- TMs, upon facing technical glitches which lead to disruption of trading services, can request for enablement of the IRRA service as per the procedures specified by the stock exchanges from time to time and IRRA shall be enabled on receipt of such requests.
- Once the service is enabled, all the investors of the TM shall be informed by the exchange of the availability of the service through email/SMS and a public notice on exchanges' website. TMs shall also communicate the same by displaying on their website.
- Investor can use IRRA service to square off/close the open position and/or cancel the pending order. The IRRA service shall not permit any action that increases the risk of the investor.
- Further, IRRA service shall also provide the TM with access to an Admin Terminal, through which the TM can monitor the actions of investors and also carry out the actions as mentioned above, on instructions of investors.
- It's important to clarify that the IRRA system is exclusively for individual investors and does not cater to algorithmic trading or institutional clients. Furthermore, its primary function is to facilitate the closure of positions and the cancellation of pending orders & not the initiation of new positions.

6.8.1 Framework to address the 'technical glitches' in Stock Brokers' Electronic Trading Systems[8]

Salient features of the SEBI circular are given below. For additional information participant may refer to the SEBI circular.

[7]https://www.sebi.gov.in/legal/circulars/dec-2022/introduction-of-investor-risk-reduction-access-irra-platform-in-case-of-disruption-of-trading-services-provided-by-the-trading-member-tm-_66785.html
[8]https://www.sebi.gov.in/legal/circulars/nov-2022/framework-to-address-the-technical-glitches-in-stock-brokers-electronic-trading-systems_65466.html

- Stock brokers shall inform about the technical glitch to the stock exchanges immediately but not later than 1 hour from the time of occurrence of the glitch.
- Stock brokers shall submit a Preliminary Incident Report to the Exchange within T+1 day of the incident (T being the date of the incident). The report shall include the date and time of the incident, the details of the incident, effect of the incident and the immediate action taken to rectify the problem.
- Stock brokers shall submit a Root Cause Analysis (RCA) Report (as per format specified by SEBI) of the technical glitch to stock exchange, within 14 days from the date of the incident.
- RCA report submitted by the stock brokers shall, inter-alia, include time of incident, cause of the technical glitch (including root cause from vendor(s), if applicable), duration, chronology of events, impact analysis and details of corrective/ preventive measures taken (or to be taken), restoration of operations etc.
- Increasing number of investors may create additional burden on the trading system of the stock broker and hence, adequate capacity planning is prerequisite for stock brokers to provide continuity of services to their clients.
- In order to streamline the reporting process of technical glitches across MIIs and creation of centralized repository of technical glitches, SEBI has developed a web-based portal, i.e. Integrated SEBI Portal for Technical Glitches (iSPOT), for submission of preliminary and final RCA reports of technical glitches by the MIIs.

Proactively and independently monitoring technical glitches shall be one of the approaches in mitigating the impact of such glitches. In this context, the stock exchange has advised to build API based Logging and Monitoring Mechanism (LAMA) to be operated between stock exchanges and specified stock brokers' trading systems. Under this mechanism, specified stock brokers shall monitor key systems & functional parameters to ensure that their trading systems function in a smooth manner.

6.8.2 Business Continuity for Interoperable Segments of Stock Exchanges[9]

The following has been decided by SEBI for the interoperable segments of stock exchanges (i.e. Cash Market/ Equity Derivatives/ Currency Derivatives/ Interest Rate Derivatives etc.):

i. **Common scrips, derivatives on single stocks or correlated indices, currency derivatives segment and interest rate derivatives**: If identical or correlated trading

[9]https://www.sebi.gov.in/legal/circulars/nov-2024/business-continuity-for-interoperable-segments-of-stock-exchanges_89032.html

products are available on another trading venue, then participants can hedge their open positions by taking offsetting positions in identical or correlated indices on other exchange. Further, as these segments are interoperable, taking offsetting positions in other trading venue would net off such open positions for end clients and release the margin. Hence, no separate treatment is required for such category of products.

ii. **Scrips exclusively listed on an exchange**: To ensure continuity, exchanges may create reserve contracts for scrips (i.e. exclusively listed scrips on other exchange) and single stock derivatives not traded on their exchange (and available on other exchange), to be invoked at the time of outage on the other exchange.

iii. **Index derivatives products not having correlated index derivatives products on another exchange**: Exchange which does not have a highly correlated index derivatives product with one available on other exchange may consider creating such an index and introducing derivatives contracts on it, in line with extant Regulatory provisions. The aforesaid would provide an avenue to hedge positions in index derivatives products of an exchange that suffered an outage.

iv. **Intimation to SEBI and Alternative Trading Venue**: The affected exchange should comply with extant Regulatory requirements with regard to handling of technical glitch / outage and intimate about the invocation of the instant business continuity mechanism to the alternative trading venue and SEBI within 75 minutes of occurrence of impact. The alternative trading venue would invoke the business continuity plan as per the Standard Operating Procedure (SOP) within 15 minutes from such intimation.

v. **NSE would act as an alternative trading venue for BSE and vice-a-versa**. Both exchanges would prepare a joint SOP that would include plan to be invoked at the time of outage on one exchange along with flow of activity involving the affected exchange and its alternative trading venue and roles/responsibility of each of them.

Sample questions

1. On the derivative exchanges, all the orders entered on the Trading System are at prices exclusive of brokerage.
(a) **True**
(b) False

2. A trader has bought 100 shares of XYZ at Rs 780 per share. He expects the price to go up but wants to protect himself if the price falls. He does not want to lose more than Rs. 1000 on this long position in XYZ. What should the trader do?
(a) Place a limit sell order for 100 shares of XYZ at Rs 770 per share
(b) **Place a stop loss sell order for 100 shares of XYZ at Rs770 per share**
(c) Place a limit buy order for 100 shares of XYZ at Rs 790 per share
(d) Place a limit buy order for 100 shares of XYZ at Rs770 per share

CHAPTER 7: INTRODUCTION TO CLEARING AND SETTLEMENT SYSTEM

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Different types of clearing members
- Interoperability of clearing corporations and its benefits
- Clearing and settlement mechanism for equity derivatives
- Risk management in equity derivatives segment
- Margining system in equity derivatives segment
- Position limits
- Settlement Guarantee Fund and Investor Protection Fund

Clearing Corporation is responsible for clearing and settlement of all trades executed in the F&O Segment of the Exchange. According to the legal principle of 'novation', the Clearing Corporation becomes the central counterparty to all trades that take place on the exchange's derivatives platform. The Clearing Corporation not only acts as a legal counterparty to all trades in this segment but also guarantees their financial settlement. The Clearing and Settlement process comprises of three main activities, viz., Clearing, Settlement and Risk Management. Clearing and settlement activities in the F&O segment are undertaken by Clearing Corporation with the help of Clearing Members and Clearing Banks.

7.1 Clearing Members

As you may recollect from our discussion in section 6.1, there are broadly three types of clearing members:

1. Self-clearing member: They clear and settle trades executed by them only, either on their own account or on account of their clients.
2. Trading member–cum–clearing member: They clear and settle their own trades as well as trades of other trading members and custodial participants.
3. Professional clearing member: They clear and settle trades executed by trading members.

Both trading-cum-clearing member and professional clearing member are required to bring in additional security deposits in respect of every trading member whose trades they undertake to clear and settle.

Clearing Members handle the responsibility of clearing and settlement of all deals executed by Trading Members, who clear and settle such deals through them. Clearing Members perform the following important functions:

- Clearing: Computing obligations of all his trading members i.e., determining positions to settle.
- Settlement: Performing actual settlement.
- Risk Management: Setting position limits based on upfront deposits / margins for each TM and monitoring positions on a continuous basis.

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 Clearing Corporation designated clearing bank for F&O segment.

Clearing Member Eligibility Norms

- Net-worth of at least Rs.300 lakhs. The Net-worth requirement for a Clearing Member who clears and settles only deals executed by him is Rs. 100 lakhs.
- Deposit of Rs. 50 lakhs to clearing corporation which forms part of the security deposit of the Clearing Member.
- Additional incremental deposits of Rs.10 lakhs to clearing corporation for each additional TM, in case the Clearing Member undertakes to clear and settle deals for other TMs.

7.2 Clearing Mechanism

The first step in clearing process is calculating open positions and obligations of clearing members. The open position 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 adding 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 (Pro) or client (Cli). 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. A TM's open position is the sum of proprietary open position, client open long position and client open short position.

Consider a clearing member 'A' with two TMs clearing through him 'PQR' and 'XYZ'.

		Proprietary Position			Client 1			Client 2			Net Member
TM	Security	Buy Qty	Sell Qty	Net Qty	Buy Qty	Sell Qty	Net Qty	Buy Qty	Sell Qty	Net Qty	
PQR	NIFTY May contract	5000	3000	2000	3000	2000	1000	3000	1000	2000	Long 5000

XYZ	NIFTY May contract	1000	2000	(1000)	2000	1000	1000	3000	4000	(1000)	Long 1000 Short 2000

Clearing member A's open position for Nifty May contract is:

Member	Long Position	Short Position
PQR	5000	0
XYZ	1000	2000
Total for A	6000	2000

Here in the above example PQR's Long Position is arrived by summing up net position of his proprietary position (i.e., 2000) and net positions of both his clients 1 & 2 (i.e., 1000 and 2000 respectively). Similarly, we have calculated the long and short positions of XYZ. Clearing member's open position is arrived by adding long positions and short positions of both the clients (i.e., 6000 long open positions and 2000 short open positions).

7.3 Interoperability of clearing corporations

Stock exchanges in India used to have their own clearing corporations to clear and settle the trades that take place on the trading platform of the respective exchange. Market participants who wish to trade on another exchange platform were required to take the membership of that exchange as well as its clearing corporation. As a result, market participants had to maintain collaterals and margin deposits at multiple clearing houses of different exchanges, often leading to inefficient allocation of capital and higher trading costs.

SEBI proposed a framework for interoperability amongst clearing corporations in 2018 and the idea has been implemented in 2019. As a result of interoperability, trades done on any exchange can be cleared and settled by the clearing corporation of any other exchange. Brokers can choose a single clearing corporation for the clearing and settlement of all their trades.

The main advantage of interoperability is the reduction in trading costs for members as they now have to maintain margins and collaterals with a single clearing corporation as against multiple clearing corporations which used to be the case earlier. This leads to better utilization of capital resources for market participants. For example, if a client has a long position in 10 lots of SBI May futures on NSE and a short position in 6 lots of the same contract on BSE, the net position will be determined as "long 4 contracts" and margin will be computed accordingly.

Also, in case of disruption of trading at any exchange or disruption of the link between an exchange and its clearing house, brokers can still route their trades to other clearing corporations. This will ensure that clearing and settlement of trades are not affected during any trading glitch. Interoperability can also simplify operations as brokers will be required to comply with the requirements of a single clearing corporation. Finally, since brokers are free to clear and settle trades at the clearing corporation of their choice, this is expected to bring in some healthy competition among clearing corporations which can lead to improvement in the pricing of their services.

7.4 Settlement Mechanism

Since October 2019, all positions in futures and options on individual securities which remain open on the expiry date of the contract are required to be settled by physical delivery. Index futures and options continue to be settled in cash. Hence, this section discusses the regulations related to clearing and settlement for both categories of contracts (i.e., cash-settled and physically settled).

Settlement of futures contracts:

Futures contracts have two types of settlements: (A) the mark-to-market (MTM) settlement which happens on a continuous basis at the end of each day, and (B) the final settlement which happens on the last trading day of the futures contract.

(A) Mark-to-market (MTM) settlement:

Mark to Market (MTM) is a process by which margins are adjusted based on daily price changes in the markets for underlying assets. The profits/losses are computed as the difference between:

a) The trade price and the day's settlement price for contracts executed during the day but not squared-off.

b) The previous day's settlement price and the current day's settlement price for brought forward contracts.

c) The buy price and the sell price for contracts executed during the day and squared-off.

The clearing member who suffers a loss is required to pay the MTM loss amount, which is passed on to the clearing member who has made an MTM profit. Clearing members are responsible for collecting and settling the daily MTM profits/losses incurred by the TMs and their clients clearing and settling through them. After completing the day’s settlement process, all the open positions are reset to the daily settlement price. These positions become the open positions for the next day.

Settlement price for daily MTM: The daily settlement price for futures contracts is based on the last 30 minutes volume weighted average price of such contract across exchanges.

In case of futures contracts which are not traded during the last half an hour on a day, a theoretical daily settlement price is computed as: $F = S * e^{rt}$, where: F = theoretical futures price, S = value of the underlying index/individual security, r = rate of interest (may be the relevant MIBOR rate or such other rate as may be specified) and t = time to expiration.

Settlement of daily MTM: The daily MTM of all futures contracts is cash-settled. The pay-in and pay-out of daily MTM settlement is effected before start of market hours on the next day as per the settlement schedule specified by the clearing corporation. The settlement takes place by debit/credit of the clearing accounts of clearing members with the respective clearing bank.

(B) Final settlement of futures contracts:

On the expiration day of the futures contracts, after the close of trading hours, the clearing corporation marks all positions of a clearing member to the final settlement price. All long positions are automatically assigned to short positions with the same series, on a random basis, for either *cash settlement* or for *delivery settlement*, whichever is applicable.

Final settlement price of futures contracts: The final settlement price for a futures contract is based on the last 30 minutes volume-weighted average price of the relevant underlying security/index across exchanges on the last trading day of the futures contract.

According to the SEBI regulations, all index futures contracts are currently cash-settled while stock futures contracts are settled by physical delivery. Hence the final settlement procedure is discussed separately for both types of futures contracts.

Final settlement procedure for cash-settled futures contracts: All positions (brought forward, created during the day, closed out during the day) of a clearing member in futures contracts, at the close of trading hours on the last trading day of the contract which are cash settled, are marked to market at the final settlement price (for final settlement) and settled. Settlement obligations for futures contracts are computed at the final settlement price of the respective futures contract. For positions bought forward from previous day, the difference between previous day's settlement price and the final settlement price on the expiry date is cash settled along with daily MTM on T+1 basis, where T is the trade date. For positions opened on the expiry day itself, the difference between the trade price and the final settlement price is cash settled. The members having a funds pay-in obligation must have a clear balance of funds in their clearing account towards their pay-in obligation by the declared pay-in time on the settlement day. The pay-out of funds is credited to the receiving members clearing account thereafter.

Final settlement procedure for futures contracts settled by physical delivery:

Settlement procedure: In case of physically settled futures contracts, the final exercise settlement is implemented on T+1 date in accordance with the settlement schedule of the clearing corporation, where T is the expiry date. The delivering clearing member must complete delivery instructions for transfer of securities to the Depository pool account on the settlement day by the cut-off time stipulated by the respective depositories. The depositories then credit the receiving members' pool account / clients' beneficiary account in accordance with the pay-out instructions received from the clearing corporation. The clearing member having a funds pay-in obligation must have clear funds in his settlement account on the settlement day. The clearing bank debits the paying members' account and credits the receiving members' settlement account in accordance with instructions received from clearing corporation on the settlement day.

Settlement Obligation: The settlement obligation is computed as under:

Unexpired Futures: Long futures result into a buy (security receivable) position, and short futures result into a sell (security deliverable) position.

Example 1: A client Mr. P of clearing member XYZ has a long position in one lot of a stock futures contract on the expiry date of the contract. Lot size is 1500. The final settlement price is Rs. 475. The previous day's settlement price was Rs. 482. What is the settlement obligation?

In this case, since Mr. P has an open long position in one lot of the stock futures contract on the expiry date, he will have to take delivery of 1500 shares on T+1 date at the final settlement price of Rs.475. The final settlement obligation works out to 1500 x 475 = Rs.7,12,500. Mr. P will have to ensure that he has the required amount in his bank account for the physical settlement. In addition, the difference between the final settlement price (Rs.475) and the previous day's settlement price (Rs. 482) will be collected from Mr. P by way of daily MTM settlement. This amount works out to Rs. (475-482) x 1500 = Rs.10,500 and will be settled in cash on T+1 day.

Example 2: A client Mr. Q of clearing member XYZ has a short position in one lot of a stock futures contract on the expiry date of the contract. Lot size is 1500. The final settlement price is Rs. 475. The previous day's settlement price was Rs. 482. What is the final settlement obligation?

Since the client has an open short position in one lot of stock futures contract on expiry date, he will have to deliver 1500 shares on T+1 date (where T is the expiry date) at the final settlement price of Rs.475. Mr. Q will have to ensure that he has the required number of shares in his demat account for delivery. In addition, the difference between the final settlement price (Rs.475) and the previous day's settlement price (Rs. 482) will

be credited to Mr. Q by way of daily MTM settlement. This amount works out to Rs. (475-482) x 1500 = Rs.10,500 and will be settled in cash on T+1 day.

Settlement of options contracts:

Options contracts have two types of settlements: Daily premium settlement and Final settlement.

Daily Premium Settlement

The buyer of an option pays the premium, while the seller receives the same. The amount payable and receivable as premium are netted to compute the net premium payable or receivable amount for each client for each option contract.

The clearing members who have a premium payable position are required to pay the premium amount to the clearing corporation and in turn this amount is passed on to the members who have a premium receivable position. This is known as daily premium settlement. The premium payable amount and premium receivable amount are directly credited/ debited to the clearing member's clearing bank account on T+1 day, where T is the trade date.

Final Exercise Settlement

All the in-the-money (ITM) stock options contracts are automatically exercised on the expiry day. ITM contracts are those that have some intrinsic value on the expiry day.

(A) Final exercise settlement of index options: Index options in India are European-style options, meaning that they can be exercised only on the expiry day. All long positions in ITM options are automatically assigned randomly to short positions in option contracts with the same series. The final settlement price is the closing price of the underlying (index or security) on the expiry day of the relevant option contract. The final exercise settlement value is the difference between the final settlement price and the strike price of the option. 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.

In other words, the final settlement amount is equal to the intrinsic value of the option at expiration. Final settlement of index options is by way of cash settlement, i.e., by debit/credit of the clearing accounts of the relevant clearing members with the respective clearing bank on T+1 day, where T is the exercise date.

Example 3: A client holds a call option on an index with a strike price of 17500 and the index closes at 17800 on the expiry day. Lot size is 50.

In this case, the final settlement will be in cash because the client holds an index option. The final settlement value will be computed as: (17800 – 17500) x 50 = Rs.15,000. This amount will be settled in cash on T+1.

(B) Final exercise settlement of stock options: Stock options in India are European-style options, meaning that they can be exercised only on the expiry day. However, unlike index options, stock options are settled by physical delivery. All long ITM options are automatically assigned by the exchange on the expiry day to short positions in option contracts with the same series on a random basis. The final settlement takes place by physical delivery in accordance with the settlement schedule of the clearing corporation.

Settlement Obligation: The settlement obligation in respect of exercised ITM options is computed as under:

(i) In the case of ITM call options, exercise of a long call results into a buy (security receivable) position and assignment of a short call results into a sell (security deliverable) position.

(ii) In the case of ITM put options, exercise of a long put results into a sell (security deliverable) position and assignment of a short put results into a buy (security receivable) position.

Settlement Obligation Value: The settlement obligation for options contract is computed at respective strike prices of the option contracts.

Example 4: A client Mr. P of clearing member XYZ has a long position in one lot of a call option on a stock with a strike price of Rs. 475. Lot size is 1500. The stock closes at Rs. 510 on the expiry date. What is the exercise settlement value?

The call option is ITM as the final settlement price (Rs 510) is higher than the strike price (Rs 475). Since the position is a long call, the client will have to take delivery of 1500 shares on T+1, where T is the expiry date. The exercise settlement value is computed as strike price x lot size, i.e., 475 x 1500 = Rs.7,12,500. The client will have to ensure that he has the required amount for the physical settlement.

Example 5: A client Mr. Q of clearing member XYZ has a long position in one lot of a put option on a stock with a strike price of Rs. 475. Lot size is 1500. The stock closes at Rs. 410 on the expiry date. What is the exercise settlement value?

The put option is ITM as the final settlement price (Rs 410) is lower than the strike price (Rs 475). Since the position is a long put, the client will have to give delivery of 1500 shares on T+1, where T is the expiry date. The exercise settlement value is computed as strike price x lot size, i.e., 475 x 1500 = Rs.7,12,500. The client will have to ensure that he has the required number of shares in his demat account for the physical settlement.

The treatment of short ITM put options is similar to that of long ITM call options. A client who is assigned a short ITM put must have funds equal to the final exercise settlement value.

The treatment of short ITM call options is similar to that of long ITM put options. A client who is assigned a short ITM call must have shareholding equal to the lot size of the assigned call option.

Net settlement of cash segment and futures and options (F&O) segment on expiry

A mechanism of net settlement of cash and F&O segments on expiry of stock derivatives has been introduced to ensure better alignment of cash and derivatives segment, reduce the price risk and allow netting efficiencies to market participants. Under the net settlement mechanism, on expiry of F&O positions, a client's obligations arising out of cash segment settlement and physical settlement of F&O positions can be settled on a net basis. This concept can be better understood with an example.

Suppose Mr. A has a long position in a put option on the stock of ABC Ltd with a strike price of 110. Mr. A purchases shares of ABC Ltd at Rs.101 on the expiry day. The settlement price on the expiry day is Rs.100. The put option held by Mr. A is in-the-money. Under the earlier rules, both these transactions were required to be settled separately. Hence, Mr. A was required to make a payment of Rs.101 on T+1 date and receive delivery of his shares. Then Mr. A was required to deliver the shares against his position of long put and receive the strike price of Rs.110. Under the net settlement scheme, there is no requirement of funds pay-in of Rs.101 for Mr.A. He would simply receive a funds pay-out equal to the difference between the strike price of his put option and the purchase price of the shares. Thus, Mr. A would receive Rs.9 as a funds payout and there would be no security pay-in or security pay-out.

This facility of net settlement between the cash and F&O segments on expiry is available only to investors who trade and clear through the same TM-CM combination in the cash and F&O segments. Investors whose TM clears trades through different CM /Clearing Corporation (CC) cannot avail the benefit of netting. The benefit of net settlement is also not available to institutional investors.

7.5 Risk Management

Exchanges, with the help of Clearing Corporations, manage the risk in the derivatives segment using a comprehensive risk containment mechanism. The salient features of risk containment measures in the F&O segment are:

- Stringent requirements of capital adequacy for membership (Financial strength of a member) help in risk management.

- Clearing corporation charges an upfront initial margin for all the open positions of a Clearing Member (CM). It specifies the initial margin requirements for each futures/options contract on a daily basis and also follows Value-At-Risk (VaR) based margining. Clearing member collects initial margin from the trading members (TMs) and their respective clients.
- The open positions of the members are settled on an MTM basis for each contract at the end of the day.
- Clearing corporation's online position monitoring system monitors a CM's open position on a real-time basis. It sets limit for each CM based on his effective deposits and simultaneously generates alert messages whenever a CM reaches certain pre-determined benchmarks of the limit. Clearing corporation monitors the CMs for Initial Margin violation, Exposure margin violation, while TMs are monitored for Initial Margin violation and position limit violation.
- A trading terminal helps the CMs to monitor the open positions of all the TMs clearing and settling through him. A CM may set limits for a TM clearing and settling through him. Clearing corporation assists the CM to monitor the intra-day limits set up by a CM and whenever a TM exceed the limits, it stops that particular TM from further trading.

The most critical component of risk containment mechanism for F&O segment is the margining system and online position monitoring. The actual position monitoring and margining is carried out online using SPAN® (Standard Portfolio Analysis of Risk) system for the purpose of computation of online margins, based on the parameters defined by the regulator.

7.6 Margining and mark to market under SPAN

In order to manage risk efficiently in the Indian securities market, exchanges have adopted SPAN (Standard Portfolio Analysis of Risk), a risk management and margining product designed by Chicago Mercantile Exchange (CME), Chicago, USA. This software was developed for calculating initial margins on the various positions of market participants.

The objective of SPAN is to identify overall potential risk in a portfolio. The program treats futures and options uniformly, while recognizing the unique exposures associated with options portfolios.

Since SPAN is used to determine initial margins on various positions, its basic objective is to determine the largest possible loss that a portfolio might reasonably be expected to suffer from one day to the next. It then sets the initial margins at a level which is sufficient to cover this one-day potential loss.

The concept of risk array represents the extent to which a specific derivative instrument will gain or lose value from the present time to a specific point in time in the near future, over a specific set of market conditions. The time is set to one trading day i.e., through the use of SPAN the maximum likely loss, which may reasonably occur over one trading day is being evaluated.

Margins

The margining system for the equity derivatives segment is as follows:

Initial margin

Margins are computed by the clearing corporation up to client level with the help of SPAN. Clearing corporation collects the initial margin for all the open positions of a Clearing Member based on the margins computed. Margins are required to be paid up-front on gross basis at individual client level for client positions and on net basis for proprietary positions. A Clearing Member collects initial margin from TM whereas TM collects from his clients.

Initial margin requirements are based on 99% value at risk over a one-day time horizon. However, in the case of futures contracts (on index or individual securities), where it may not be possible to collect mark to market settlement value, before the commencement of trading on the next day, the initial margin is computed over a two-day time horizon, applying the appropriate statistical formula. The methodology for computation of Value at Risk percentage is as per the recommendations of SEBI from time to time.

Premium Margin

Along with Initial Margin, Premium Margin is also charged at the client level. Premium margin includes premium amount due to be paid to the Clearing Corporation towards premium settlement, at the client level. Premium margin is levied till the completion of pay-in towards the premium settlement.

Assignment Margin for Options on Securities

Along with Initial Margin and Premium Margin, assignment margin is required to be paid on assigned positions of Clearing Members towards final exercise settlement obligations for option contracts on individual securities, till such obligations are fulfilled. Assignment margin is levied on assigned positions of the clearing members towards final exercise settlement obligations for option contracts on index and individual securities which are settled in cash. Assignment margin is the net exercise settlement value payable by a clearing member towards final exercise settlement. It is levied till the completion of pay-in towards the exercise settlement.

Intra-day crystallised Losses

Clearing corporation calculates and levies Intraday Crystallised Losses (ICMTM) in the following manner:

a) ICMTM is computed for all trades which are executed and result into closing out of open positions.
b) ICMTM is calculated based on weighted average prices of trades/positions
c) ICMTM is computed only for futures contracts.
d) ICMTM is part of initial margin and is be adjusted against the liquid assets of clearing member on a real-time basis.
e) Crystallised losses at a contract level for a client are adjusted against crystallised profits, if any, from another contract for the same client to arrive at client level profit or loss.
f) All client level losses across all trading members including losses on proprietary positions of trading members, if any, are grossed up to arrive at clearing member level ICMTM.
g) ICMTM so blocked/ collected is released on completion of daily / final mark to market settlement pay-in

Delivery Margins

Delivery margins are levied on lower of potential deliverable positions or in-the-money long option positions, four days prior to expiry of derivative contracts which are required to be settled through delivery. Example: If expiry of derivative contract is on Thursday, the delivery margins on potential ITM long option positions become applicable from the EOD of the previous Friday. Delivery margins are part of the initial margins of the clearing member and are computed at a client level settlement obligation for all positions to be settled through delivery. Client level potential ITM long option positions are computed on daily basis. ITM options are identified based on the closing price of the security in the underlying Capital Market segment on the respective day. Delivery margins are levied at client level and collected from clearing member in a staggered manner as under:

- 20% of Delivery margins computed on Expiry - 4 EOD
- 40% of Delivery margins computed on Expiry - 3 EOD
- 60% of Delivery margins computed on Expiry - 2 EOD
- 80% of Delivery margins computed on Expiry - 1 EOD

Positions which are converted to settlement by delivery after the expiry date become subject to levy of margins as applicable in Capital Market segment (i.e., VaR, Extreme Loss Margins and Mark to Market margins). Delivery margins blocked are released on completion of the settlement.

Exposure Margins

The VaR and Extreme Loss percentage as computed in the Capital Market segment are applied on client level settlement obligations. The margins rate is updated for every

change in margin rate in Capital Market segment. Clearing members are subject to exposure margins in addition to initial margins.

Short Option Minimum Charge

The Short Option Minimum Charge was a margin to cover the risk associated with short option positions in extremely deep-out-of-the-money strikes. SEBI has recently done away with the concept of short option minimum charge, vide its circular dated February 24, 2020. Hence this concept is not discussed further.

Net Option Value

Net Option Value is computed as the difference between the long option positions and the short option positions, valued at the last available closing price of the option contract and is updated intraday at the current market value of the relevant option contracts at the time of generation of risk parameters. The Net Option Value is added to the Liquid Net worth of the clearing member. Thus, mark to market gains and losses are not settled in cash for options positions.

Client Margin reporting

Clearing corporation informs all members of the margin liability of each of their client. Additionally, members are required to report details of margins collected from clients to clearing corporation, which holds in trust client margin monies to the extent reported by the member as having been collected from their respective clients. Any non-collection or short collection of margins by members from their clients is penalized by the exchanges.

A broker's clients often deposit securities with the broker by way of margins for their positions. There is a risk that the broker may misappropriate a client's securities and use these to fund the margin obligations on his proprietary positions or that of some other client. To mitigate this risk, it is now mandatory for brokers to accept collateral from clients in the form of securities, only by way of a 'margin pledge', created in the Depository system. The broker is required to open a separate demat account for accepting such margin pledge, termed as 'Client Securities Margin Pledge Account. The broker must ensure that the client's securities re-pledged to the clearing corporation are available to give exposure limit to that client only.

Recently, brokers have been asked to report disaggregated information on collaterals collected by them at the client level. Trading members are required to report this information to their clearing member while clearing members must report this to the exchange and clearing corporation. Similarly, stock exchanges / clearing corporations have been asked to provide a web portal to allow clients to view the collateral reported by the members.

Peak margin obligation

SEBI has introduced significant changes to its framework for upfront collection of margins from clients in Cash and Derivatives segment vide its circular dated July 20, 2020. Till recently, client margin reporting by brokers was on an end-of-day (EOD) basis. As a result, many brokers allowed clients to maintain lower margins on intraday positions. For example, suppose the initial margin and exposure margin required on a client's EOD derivatives position is Rs.1 lakh. However, it is quite possible that the client had taken several other positions during the day and squared off these positions by EOD. The margin required on these positions could be much higher than the EOD margin of Rs. 1 lakh. Let us say that the broker allowed the client to maintain a margin of just Rs.30,000 throughout the day. This amounts to excessive intraday leverage being allowed to the client. Such leverage can lead to large losses on days of high volatility.

To further strengthen risk management by brokers, SEBI introduced the concept of peak margin computation through its circular dated July 20, 2020. As per the new regulations, clearing corporations are required to send a minimum of 4 snapshots of client-wise margin requirement to TMs/CMs to enable them to know the intraday margin requirement per client in each segment. The member must report the margin collected from each client, as at EOD and peak margin collected during the day, in the following manner:

(a) EOD margin obligation of the client is compared with the respective client margin available with the TM/CM at EOD, and

(b) Peak margin obligation of the client, across the snapshots, is compared with respective client peak margin available with the TM/CM during the day.

The broker had to pay a penalty on any shortfall in collection of margin, which is higher of (a) or (b) above.

The peak margin obligation regulations were to be implemented in a phased manner to enable brokers and their clients to adapt to the new framework. However, considering representations received from market participants and after deliberations with various stakeholders, SEBI clarified, through a circular dated May 10, 2022, that the margin requirements to be considered for the intra-day snapshots in derivatives segments (including commodity derivatives), would be calculated based on the fixed Beginning of Day (BOD) margin parameters. The BOD margin parameters would include all SPAN margin parameters as well as ELM requirements. It was later decided, in accordance with a circular issued on February 1, 2023, that the EOD margin collection requirement from clients, in derivatives segments (including commodity derivatives), would also be calculated based on the fixed BOD margin parameters. SEBI clarified that these changes were only for the purpose of verification of the upfront collection of margins from clients. The margin parameters applicable for the collection of margin obligation by Clearing

Corporations would continue to be updated on intra-day and EOD basis, as per existing regulations.

For example: Let's suppose you are trading in banknifty weekly options, and based on the beginning of day margin requirements, you need Rs 10,000 to trade in it. So, you deposit Rs 11,000 in your trading account and execute the trade. But due to market fluctuations and volatility, the margin requirement reached Rs 12,000, but you only had Rs 11,000 cash in your trading account. So, depending upon the time of snapshot (by the clearing corporation) of your position, you would have been charged a short margin penalty as per SEBI earlier peak margin rules.

But starting August 1, 2022, this penalty would not be charged, as now the beginning of the day margin (Rs. 10,000 as per above example) requirement will be applicable throughout the day trading session. This can help market participants to calculate their position better by deploying just enough capital to execute their trade and better manage their capital.

Cross Margin

Salient features of the cross margining available on exchanges is as follows:

1. Cross margining is available across Cash and Derivatives segment.
2. Cross margining is available to all categories of market participants.
3. The positions of clients in both the Capital market and derivatives segments to the extent they offset each other only are considered for the purpose of cross margining.
4. When a Clearing Member clears for client/ entities in Cash and Derivatives segments, he is then required to intimate client details through a Collateral Interface for Members (CIM) to benefit from Cross margining.
5. When different Clearing Members clear for client/entities in Cash and Derivatives segments they are required to enter into necessary agreements for availing cross margining benefit.
6. Clients who wish to avail cross margining benefit in respect of positions in Index Futures and Constituent Stock Futures only, their clearing member in the Derivatives segment needs to provide the details of the clients.

Early Pay-in of Securities and Funds

In cases where early pay-in of securities is made by the members, such positions for which early pay-in (EPI) of securities is made shall be exempt from delivery margins. Clearing members can make the early pay-in of securities through either of the depositories, viz., NSDL and CDSL. In NSDL, clearing members shall deliver the securities to their pool

account and execute irreversible delivery out instructions through their Depository Participant for the particular settlement. In CDSL, clearing members can transfer the security to their early pay-in account with CDSL for Capital Market segment with Clearing Corporation. Clearing members can provide the details of the clients to whom early pay-in benefit is to be provided through a file upload. In cases where early pay-in of funds is made, such positions shall be exempt from delivery margins.

Mechanism for pledge/repledge of client securities

In the past, clients would provide a power of attorney to their broker to enable the broker to transfer securities from the client's demat account to their collateral account for the purpose of meeting the client's margin obligations. There have been instances when brokers have misused the power of attorney and diverted one client's securities to meet the margin obligations of another client or that of the broker's proprietary positions or for funding other businesses of the broker. In other cases, dividends on shares held by inactive clients have been misappropriated by some brokers. To curb the misappropriation or diversion of client securities by the broker, SEBI introduced a new pledge/repledge mechanism which came into effect from September 2020.

Under the new regime, clients can provide collateral for margin purposes only through a margin pledge and not simply by executing a power of attorney in favour of their broker. The new regime requires Depositories to provide a separate pledge type viz. 'margin pledge', for pledging client's securities as margin to the Trading Member / Clearing Member. TMs / CMs must open a separate demat account for accepting the margin pledge by the client. This demat account is tagged as the Client Securities Margin Pledge Account. A client who wishes to provide collateral to his broker for margin obligations may pledge securities using the Margin Pledge facility of the Depository.

The TM can re-pledge these securities to the CM only from the Client Securities Margin Pledge Account of the TM. The CM can re-pledge such securities to the Clearing Corporation. This mechanism ensures that the complete trail of such re-pledge is reflected in the demat account of the pledgor. Since the security is only pledged to the TM and there is no transfer of title from the client to the TM, the risk of misappropriation of the securities by the TM/CM is mitigated. Also, the new mechanism requires the TM/CM to ensure that a client's securities that are repledged to the CM/Clearing Corporation are used to meet the margin obligations of that client only.

Segregation and monitoring of collateral at the client level

SEBI has introduced a new reporting mechanism by TMs and CMs for cash and non-cash collateral provided by their clients. The purpose of this reporting is to provide a clear visibility of client-wise collateral at all levels. Accordingly, TMs are required to report to

their CM disaggregated information on collaterals received by the TMs at the client level. Thus, the TM has to report the following to the CM: (a) client collateral received from individual clients, (b) client collateral retained by the TM, and (c) client collateral placed by the TM with the CM. CMs are in turn required to report to the Clearing Corporation disaggregated information on collaterals at the client level of the TMs and proprietary collaterals of the TM. Thus, CMs are required to report the following to the CC: (a) client collateral received by the TM from individual clients, (b) client collateral retained by the TM, (c) client collateral placed by the TM with the CM, (d) client collateral retained by the CM, and (e) client collateral placed by the CM with the CC. This reporting is required on a daily basis.

The purpose of the new reporting mechanism is to ensure that the Clearing Corporation has clear visibility of the client-wise collateral at various levels.

7.7 Position limits

Position limits are an important part of the risk management framework of a derivatives exchange. A position limit on a derivatives exchange is a restriction on the ownership that limits the number of derivatives contracts that a trading member or client, acting individually or together with others, can own. Position limits are needed to prevent traders from manipulating prices by accumulating control over the market or individual stocks through derivatives contracts. SEBI has laid down three types of position limits in the equity derivatives segment in India. These are: client-level position limit, trading member-wise position limit and a market-wide position limit. The rules regarding the computation and monitoring of these different position limits are as follows:

Client Level Position Limits

- Futures and Option contracts on individual securities: The gross open position across all the derivative contracts for a security for each specific client shall not exceed higher of:
  - 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 per Exchange (in terms of number of shares).
- Client level position limits security-wise, are made available to members on the Exchange website.
- Any person or persons acting in concert who together own 15% or more of the open interest on a particular underlying index, is required to report this fact to the Exchange / Clearing Corporation. Failure to do so shall be treated as a violation and shall attract appropriate penal and disciplinary action in accordance with the Rules, Byelaws and Regulations of the Clearing Corporation.

Trading Member-wise Position Limit

- Index Futures: The trading member position limits in equity index futures contracts shall be higher of Rs.7500 crores or 15% of the total open interest in the market in equity index futures contracts. This limit would be applicable on open positions in all futures contracts on a particular underlying index.
- Index Options: The trading member position limits in equity index option contracts shall be higher of Rs.7500 crores or 15% of the total open interest in the market in equity index option contracts. This limit would be applicable on open positions in all option contracts on a particular underlying index.
- Individual Securities: The combined futures and options position limit shall be 20% of the applicable Market Wide Position Limit (MWPL) per Exchange. The Clearing Corporation shall specify the trading member-wise position limits on the last trading day of the month which shall be reckoned for this purpose during the next month.

Market-Wide Position Limits (MWPL)

- MWPL for futures and options contracts on individual securities shall be 20% of the number of shares held by non-promoters in the relevant underlying security i.e., 20% of the free float in terms of the number of shares of a company.
- The Clearing Corporation shall specify the MWPL on the last trading day of the month which shall be reckoned for this purpose during the next month.
- Trading systems display an alert once the open interest in the futures and options contract in a particular security exceeds 60% of the MWPL specified for such security.
- The aggregate open interest of the security across Exchanges shall be considered for the purpose of monitoring of MWPL. If the aggregate open interest of the security across Exchanges exceeds 95 per cent of the MWPL, no fresh positions shall be permitted for the said security from the subsequent trading day. The normal trading in the security shall be resumed only after the aggregate open outstanding position across Exchanges comes down to 80% or below of the MWPL.

Apart from the above, additional position limit rules may be applicable to Foreign Portfolio Investors (FPIs), Mutual Funds and Non-Resident Individuals (NRIs) as specified in SEBI circular IMD/FPI&C/CIR/P/2019/124 dated November 05, 2019 and in the SEBI FPI regulations 2019.

Position Limits for Index Futures and Index Options

PAN Level Position Limits for index options:

Particulars	Position Limit
Net end of day FutEq OI	₹1,500 Cr
Gross FutEq OI	₹10,000 Cr

Position limits for index futures (measured on gross notional basis):

Particulars	Position Limit
FPI Category I/Mutual Funds/Trading Member (Proprietary)/Clients	Higher of 15% of index futures OI or ₹500 Cr
FPI Category II (other than individuals, family offices and corporates)	Higher of 10% of index futures OI or ₹500 Cr
FPI Category II (Individuals, family offices and corporates)	Higher of 5% of index futures OI or ₹500 Cr

Dynamic and Changing Open Interest (OI) of Position Limits:

a. Position Limits are based on total OI of the market at the end of previous day's trade.
b. If OI drops compared to the previous day, market participants can breach the position limits.

Stock exchange will provide the facility for the monitoring of FutEq OI till December 05, 2025, post which broking entities are expected to have their own delta computing / monitoring system. You may see the SEBI Circular[10] for more details.

Intraday monitoring of position limits

Particulars	Position Limit
Intraday Net position limit (FutEq basis)	₹5,000 Cr
Intraday Gross position limit (FutEq basis)	₹10,000 Cr

In addition to the End of Day monitoring mechanism as stated above, the position limits, for equity index derivative contracts, would continue to be monitored by stock exchanges through a minimum of four random snapshots during the trading day (including one

[10] SEBI Circular Ref.: SEBI/HO/MRD/TPD-1/P/CIR/2025/79 Dated May 29, 2025

snapshot between 14:45 hrs to 15:30 hrs i.e. around market closing time where heightened activity is generally observed). You may see the SEBI Circular[11] for more details.

When client-level position limits are exceeded, the clearing member/ trading member must ensure that the client does not take any fresh positions and the existing positions must be reduced within permissible limits. The exchange collects a penalty from the clearing member for such violations and the clearing member can recover the same from the trading member or client violating the position limit. Trading member limit violation is monitored throughout the day. In case of a violation, the trading member is not allowed to increase his open position in the security/index in which position is exceeded. MWPL violation is checked by the exchange at the end of every trading day. At the end of each day during which the ban on fresh positions is in force for any stock, when any member or client has increased his existing positions or has created a new position in that scrip, the client/ trading members are charged a penalty. The penalty is recovered from the clearing member affiliated with such trading members/clients on a T+1 day basis along with pay-in.

7.8 Violations and Penalties

Non-compliance of any provisions of the Rules, Bye-laws and Regulations by any clearing member or trading member is treated as a violation and attracts appropriate action which includes penalties. The following are some of the compliance lapses which attract such penal charges:

- Non-fulfilment of initial margin obligations
- Non-fulfilment of settlement obligation
- Non-fulfilment of securities deliverable obligation
- Non-fulfilment of minimum deposit requirements
- Exposure margin violation
- Position limit violation
- Mis-utilisation of trading member/constituent/client collaterals and deposits
- Violation of exercised positions
- Short or non-reporting of client margin
- Market wide Position Limit (MWPL) violation

In the event of a violation, Clearing Corporation may advice the Exchanges to withdraw any or all of the membership rights of the clearing member including the withdrawal of trading facilities of all trading members and/or clearing facility of custodial participants clearing through such clearing members, without any notice. In addition, the outstanding

[11] SEBI Circular Ref.: SEBI/HO/MRD/TPD-1/P/CIR/2025/122 Dated September 01, 2025

positions of such clearing member and/or trading members clearing and settling through such clearing member, may be closed out and such action shall be final and binding on the clearing member and/or trading member. Clearing Corporation can also take additional measures like imposing penalties, collecting appropriate deposits, invoking bank guarantees or fixed deposit receipts, realising money by disposing off the securities, etc.

7.9 Settlement of running account of Client's funds lying with the TM:

With a view to prevent any misuse of a client's funds by the broker, SEBI has made it mandatory for brokers to settle the running account of client funds on a monthly or quarterly basis as per the mandate of the client.

The TM (Trading Member), after considering the End of the Day (EOD) obligation of funds across all the Exchanges, shall settle the running accounts at the choice of the clients on quarterly and monthly basis, on the dates stipulated by the Stock Exchanges. To ensure uniformity and clarity on dates of such monthly and quarterly settlement of client accounts; Stock exchanges shall, jointly, issue the annual calendar for the settlement of running account (quarterly and monthly) at the beginning of the financial year.

For the clients having credit balance, who have not done any transaction in the 30 calendar days since the last transaction lying with member for more than such 30 calendar days, the entire credit balance of client shall be returned to the client by TM, on the upcoming settlement dates of monthly running account settlement cycle (irrespective of settlement cycle preferred by the client) as stipulated by stock exchanges.

However, if the client trades after 30 calendar days and before aforesaid upcoming settlement dates of monthly running account settlement cycle, the settlement of account of client shall continue to be done by the Trading member as per the preference of quarterly/monthly as indicated by the client for running account settlement.

7.10 Settlement Guarantee Fund and Investor Protection Fund:

Clearing corporations are required to have in place a Core Settlement Guarantee Fund (Core SGF). The primary objective of the Core SGF is to have a fund for each segment (for e.g., Cash, F&O, CD, etc.) to guarantee the settlement of trades executed in the respective segment of the stock exchange. In the event of a clearing member failing to honour settlement commitments, the core SGF is used to fund the obligations of that member and complete the settlement without affecting the normal settlement process.

Exchanges have established an Investor Protection Fund with the objective of compensating investors in the event of defaulting members' assets not being sufficient to

meet the admitted claims of investors. The other objectives of this Fund include promoting investor education, awareness and research. The Investor Protection Fund is administered by way of a registered Trust created for the purpose.

Recent measures adopted by SEBI to strengthen the equity index derivatives framework to ensure investor protection and market stability. These measures include following:

I. **Upfront Collection of Option Premium**: Starting February 1, 2025, trading members must collect the entire premium upfront from options buyers to limit undue leverage and mitigate risks.

II. **Removal of Calendar Spread Benefits on Expiry Day**: Effective February 1, 2025, contracts expiring on the same day will no longer receive margin offsets to address basis risks and speculative volatility.

III. **Intraday Monitoring of Position Limits**: From April 1, 2025, exchanges must monitor position limits intraday with at least four random snapshots per day.

IV. **Revision of Index Derivatives Contract Sizes**: From November 20, 2024, the minimum contract size for new index derivatives will be increased to reflect a market value of ₹15–₹20 lakhs.

V. **Rationalization of Weekly Index Derivatives**: Effective November 20, 2024, each exchange may only offer weekly expiring derivatives on one benchmark index.

VI. **Additional Tail Risk Coverage on Expiry Day**: From November 20, 2024, an additional 2% extreme loss margin will apply to short options on expiry days to account for heightened speculative activity.

These measures aim to reduce excessive speculation, improve risk management, and align the framework with evolving market dynamics.

7.11 Cyber Security & Cyber Resilience framework (CSCRF) for Stock Brokers / Depository Participants

Rapid technological developments in securities market highlighted the need for maintaining a robust cyber security and cyber resilience framework to protect the integrity of data and guard against breaches of privacy. Since stock brokers and depository participants perform significant functions in providing services to holders of securities, these entities should have robust cyber security and cyber resilience framework. This shall provide for essential facilities and perform systemically critical functions relating to

securities market. Cyber security framework includes measures, tools and processes that are intended to prevent cyber-attacks and improve cyber resilience.

SEBI has recently notified a detailed CSCRF for the SEBI Regulated Entities (REs) that shall come into effect, in phased manner, starting from January 1, 2025 onwards (superseding the existing circulars). The key objective of CSCRF is to address evolving cyber threats, to align with the industry standards, to encourage efficient audits, and to ensure compliance by SEBI Regulated entities. As per the CSCRF, the following REs are constituted as the Market Infrastructure Institutions (MIIs):

a. Stock Exchanges
b. Depositories
c. Clearing Corporations
d. KYC Registration Agencies (KRAs)
e. Qualified Registrars and Transfer Agents (QRTAs)

Cyber Resilience is an organization's ability to prepare and respond to a cyber-attack and to continue operation during, and recover from, a cyber-attack. The Cyber Security and Cyber Resilience Framework is based on 5 cyber resiliency goals:

1. **Anticipate**: Maintain a state of informed preparedness from adversary attacks.
2. **Withstand**: Continue essential business functions at times of adversary attacks.
3. **Contain**: In the event of cyber-attacks, localise containment of crisis and isolate trusted functions from untrusted ones to continue business operations.
4. **Recover**: Restore business functions to the maximum extent, subsequent to adversary attacks.
5. **Evolve**: To change business functions and its supporting cyber capabilities to minimize adverse impacts of adversary attacks (actual or predicted).

Sample questions

1. Trader A wants to sell 20 contracts of August series at Rs 4500 and Trader B wants to sell 17 contracts of September series at Rs 4550. Lot size is 50 for both these contracts. The Initial Margin is fixed at 6%. How much Initial Margin is required to be collected from both these investors (sum of initial margins of A and B) by the broker?
(a) 2,70,000
(b) **5,02,050**
(c) 2,32,050
(d) 4,10,000

2. A member has two clients C1 and C2. C1 has purchased 800 contracts and C2 has sold 900 contracts in August XYZ futures series. What is the outstanding liability (open position) of the member towards Clearing Corporation in number of contracts?
(a) 800
(b) **1700**
(c) 900
(d) 100

3. Clients' positions cannot be netted off against each other while calculating initial margin on the derivatives segment.
(a) **True**
(b) False

4. Mark-to-market margins are collected _____.
(a) On a weekly basis
(b) Every 2 days
(c) Every 3 days
(d) **On a daily basis**

5. Value-at-risk measures _____.
(a) Value of proprietary portfolio
(b) **Risk level of a financial portfolio**
(c) Net-worth of an investor
(d) Credit rating of an investor

CHAPTER 8: LEGAL AND REGULATORY ENVIRONMENT

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Definition of securities and derivatives as per the Securities Contract (Regulation) Act, 1956
- Functions of SEBI
- Regulatory framework for derivatives market trading, clearing, settlement and risk management
- Eligibility criteria for membership on derivatives segment

The trading of derivatives is governed by the provisions contained in the Securities Contracts (Regulation) Act, 1956; the Securities Exchange Board of India Act, 1992; the rules and regulations framed there under and other rules and bye–laws of stock exchanges.

8.1 Securities Contracts (Regulation) Act, 1956

The Act aims to prevent undesirable transactions in securities. It governs the trading of securities in India. The term "securities" has been defined in the Section 2(h) of SCRA. The term 'Securities' include:

- Shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or other body corporate
- Derivatives
- Units or any other instrument issued by any collective investment scheme to the investors in such schemes
- 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
- Units or any other such instrument issued to the investors under any mutual fund scheme (securities do not include any unit linked insurance policy or scrips or any such instrument or unit, by whatever name called which provides a combined benefit risk on the life of the persons and investment by such persons and issued by an insurer refer to in clause (9) of section 2 of the Insurance Act, 1938 (4 of 1938))
- 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 mortgage 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
- Government securities

- Such other instruments as may be declared by the Central Government to be securities (including onshore rupee bonds issued by multilateral institutions like the Asian Development Bank and the International Finance Corporation)
- Rights or interests in securities

According to the act "Derivatives" is defined as:

- 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.
- A contract which derives its value from the prices, or index of prices, of underlying securities.
- Commodity derivatives, and
- Such other instruments as may be declared by the Central Government to be derivatives.
- Section 18A provides that notwithstanding anything contained in any other law for the time being in force, contracts in derivative shall be legal and valid if such contracts are:
    - Traded on a recognized stock exchange
    - Settled on the clearing house of the recognized stock exchange, in accordance with the rules and bye–laws of such stock exchanges.

8.2 Securities and Exchange Board of India Act, 1992

SEBI Act, 1992 provides for establishment of Securities and Exchange Board of India (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 corporate in the issuance of capital and transfer of securities, in addition to all intermediaries and persons associated with securities market. SEBI has been obligated to perform the aforesaid functions by such measures as it thinks fit. In particular, it has powers for:

- Regulating the business in stock exchanges and any other securities markets;
- Registering and regulating the working of stock brokers, sub–brokers, etc.;
- Promoting and regulating self-regulatory organizations;
- Prohibiting fraudulent and unfair trade practices relating to securities markets;
- Calling for information from, undertaking inspection, conducting inquiries and audits of the stock exchanges, mutual funds and other persons associated with the securities market and intermediaries and self–regulatory organizations in the securities market;
- Performing such functions and exercising according to Securities Contracts (Regulation) Act, 1956, as may be delegated to it by the Central Government.

8.3 Regulations in Trading

A committee under the chairmanship of Dr. L. C. Gupta was set by SEBI to develop the appropriate regulatory framework for derivatives trading in India. On May 11, 1998, SEBI accepted the recommendations of the committee and approved the phased introduction of derivatives trading in India beginning with stock index futures.

The provisions in the SCRA and the regulatory framework developed there under govern trading in securities. The amendment of the SCRA to include derivatives within the ambit of 'securities' made trading in derivatives possible within the framework of that Act.

- Any Exchange fulfilling the eligibility criteria as prescribed in the L.C. Gupta committee report can apply to SEBI for grant of recognition under Section 4 of the SCRA, 1956 to start trading derivatives. The derivatives exchange/segment should have a separate governing council and representation of trading/clearing members shall be limited to maximum of 40% of the total members of the governing council. The exchange would have to regulate the sales practices of its members and would have to obtain prior approval of SEBI before start of trading in any derivative contract.
- The Exchange should have a minimum of 50 members.
- The members of an existing segment of the exchange would not automatically become the members of derivative segment. The members of the derivative segment would need to fulfil the eligibility conditions as laid down by the L.C. Gupta committee.
- The clearing and settlement of derivatives trades would be through a SEBI approved clearing corporation. Clearing corporations, complying with the eligibility conditions as laid down by the committee, have to apply to SEBI for grant of approval.
- Derivative brokers/dealers and clearing members are required to seek registration from SEBI. This is in addition to their registration as brokers of existing stock exchanges. The minimum net worth for clearing members of the derivatives clearing corporation shall be Rs.300 Lakhs. The net worth of the member shall be computed as follows:
    - Capital + Free reserves
    - Less non-allowable assets viz.,
        - Fixed assets
        - Pledged securities
        - Member's card
        - Non-allowable securities (unlisted securities)
        - Bad deliveries
        - Doubtful debts and advances
        - Prepaid expenses
        - Intangible assets

    - 30% marketable securities
- The minimum contract value shall not be less than Rs 5,00,000 and this subject to change as per SEBI and Exchange rules. Effective Nov 20, 2024, SEBI has prescribed minimum contract value in the range of Rs. 15 to 20 lakhs, Exchanges have to submit details of the futures contract they propose to introduce.
- The initial margin requirement, exposure limits linked to capital adequacy and margin demands related to the risk of loss on the position will be prescribed by SEBI/ Exchange from time to time.
- The L. C. Gupta committee report requires strict enforcement of "Know your customer" rule and requires that every client shall be registered with the derivatives broker. The members of the derivatives segment are also required to make their clients aware of the risks involved in derivatives trading by issuing to the client the Risk Disclosure Document and obtain a copy of the same duly signed by the client.
- The trading members are required to have qualified approved user and sales person who have passed a certification programme approved by SEBI.

Members and authorized dealer have to fulfil certain requirements and provide collateral deposits to become members of the F&O segment. All collateral deposits are segregated into cash component and non-cash component. Cash component means cash, bank guarantee, fixed deposit receipts, T-bills and dated government securities. Non-cash component means all other forms of collateral deposits like deposit of approved demat securities.

Net worth criteria for Clearing Members has been provided by SEBI, while net worth criteria for Trading Members and Limited Trading Members have been decided by stock exchanges. Few exchanges have a special category of members called Limited Trading Members, who are not cash market members of exchange.

The broker is required to get a Risk Disclosure Document signed by the client, at the time of client registration. This document informs clients about the kind of risks that derivatives can involve for the client. It makes the client aware and informed about the various risks associated with derivatives trading. Apart from other records, Trading Members are required to maintain trade confirmation slips and exercise notices from the trading system for a period of 5 years. All member brokers in the derivative segment are required to be inspected by the exchange at least once a year.

A default by a member in the derivatives segment is treated as default in all segments of that exchange and as default on all exchanges where he is a member.

The purpose of inspection of stockbrokers' records under the SEBI (Stock Broker) Regulations, 1992 is to ensure that the books of accounts and other books are being maintained in the manner required.

The recognition to a stock exchange under the Securities Contract (Regulation) Act 1956 can be granted by the Central Government. It provides for direct and indirect control of virtually all aspects of securities trading and the running of Stock Exchanges and aims to preventing undesirable transactions in securities. It gives the Central Government the 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

A penalty or suspension of registration of a stock broker under the SEBI (Stock Broker) Regulations, 1992 can be ordered if:

- The stock broker violates the provisions of the Act
- The stock broker does not follow the code of conduct
- The stock broker fails to resolve the complaints of the investors
- The stock broker indulges in manipulating, or price rigging or cornering of the market
- The stock broker's financial position deteriorates substantially
- The stock broker fails to pay fees
- The stock broker violates the conditions of registration
- The stock broker is suspended by the stock exchange

Position limits are the maximum exposure levels which can be assumed by each investor or Clearing Member or the market as a whole. Such position limits are defined by SEBI.

Each Clearing Member may have several Trading Members with him. The trading limits for each such Trading Member are decided by Clearing Members on the computerized trading system.

Once a Trading Member reaches his position limit, he will not be able to enter any fresh transactions which have the impact of increasing his exposure. He will be able to enter only those transactions which result in the reduction of his exposure. Thus, new positions will not be permitted, but only squaring-off of existing positions will be permitted.

8.4 Regulations in Clearing & Settlement and Risk Management

Anybody interested in taking membership of F&O segment is required to take membership of "Capital Market and F&O segment" or "Capital Market, Wholesale Debt Market and F&O segment". A membership for Capital Markets and F&O segment gives

member the right to execute trades and to clear and settle the trades executed by the members in these segments. Similarly, a membership for Capital Market, Wholesale Debt Market and F&O segment gives the member a right to execute trades and to clear and settle the trades executed by the members in these segments. An existing member of CM segment can also take membership of F&O segment. A trading member can also be a clearing member by meeting additional requirements. There can also be only clearing members.

The initial and exposure margin is payable upfront by Clearing Members. Initial margins can be paid by members in the form of Cash, Bank Guarantee, Fixed Deposit Receipts and approved securities.

Clearing members who are clearing and settling for other trading members can specify the maximum collateral limit towards initial margins, for each trading member and custodial participant clearing and settling through them.

Such limits can be set up by the clearing member, through the facility provided on the trading system up to the time specified in this regard. Such collateral limits once set are applicable to the trading members/custodial participants for that day, unless otherwise modified by clearing member.

Non-fulfilment of either whole or part of the margin obligations is treated as a violation of the Rules, Bye-Laws and Regulations of clearing corporation and attracts penalty from the Clearing Corporation.

In addition, the clearing corporation can initiate other disciplinary actions, such as withdrawal of trading facilities and/or clearing facility, close out of outstanding positions, imposing penalties, collecting appropriate deposits, invoking bank guarantees / fixed deposit receipts, etc.

Clearing member is required to provide liquid assets which adequately cover various margins and liquid Net-worth requirements. He may deposit liquid assets in the form of cash, bank guarantees, fixed deposit receipts, approved securities and any other form of collateral as may be prescribed from time to time. The total liquid assets comprise of at least 50% of the cash component and the rest is non-cash component.

Responsibilities of the Clearing Corporation include:

- Collection of Margins on a timely basis
- Smooth operation of the daily clearing and settlement
- Acting as a legal counterparty for every contract
- Monitoring the positions in derivatives and cash segments
- Deciding Daily Settlement Prices

- Keeping a consistent record of margins at client level
- Ensuring that client margins are not appropriated against brokers' dues

The Clearing Corporation can transfer client positions from one broker member to another broker member in the event of a default by the first broker member.

Some of the reports / information which a derivatives segment of a Stock Exchange has to provide to SEBI are:

- Occasions when the 99% Value at Risk limit has been violated
- Defaults by broker-members
- Daily market activity report
- Daily market report

Main objectives of Trade Guarantee Fund (TGF):

- To guarantee settlement of bonafide transactions of the members of the exchange.
- To inculcate confidence in the minds of market participants.
- To protect the interest of the investors in securities.

All active members of the Exchange are required to make initial contribution towards Trade Guarantee Fund of the Exchange.

8.5 Eligibility criteria for membership on derivatives segment

The eligibility criteria for becoming a member of the derivatives segment of an exchange are as follows:

- **Balance Sheet Net Worth Requirements:** SEBI has prescribed a net worth requirement of Rs. 3 crores for clearing members. The clearing members are required to furnish an auditor's certificate for the net worth every 6 months to the exchange. The net worth requirement is Rs. 1 crore for a self-clearing member. SEBI has not specified any net worth requirement for a trading member.
- **Liquid Net Worth Requirements:** Every clearing member (both clearing members and self-clearing members) has to maintain at least Rs. 50 lakhs as Liquid Net worth with the exchange / clearing corporation.
- **Certification requirements:** The Members are required to pass the certification programme approved by SEBI. Further, every trading member is required to appoint at least two approved users who have passed the certification programme. Only the approved users are permitted to operate the derivatives trading terminal.

8.6 Standard Operating Procedure in the case of default by TM or CM

SEBI has laid down the actions to be taken by stock exchanges, clearing corporations and depositories whenever they see any warning signals of a possible default by a TM or CM. On receiving any such warning signals, the exchanges, clearing corporations and depositories are required to act in the manner laid down in the Standard Operating Procedure (SOP), to protect the interests of the non-defaulting clients of the TM. The Clearing Member of the TM is also required to take the necessary actions laid down in the SOP. As an interim measure, the stock exchanges and clearing corporations are required to settle the credit balances of small investors (those with balances less than Rs.25 lakh) using the unencumbered deposits available with them. Investors with credit balances exceeding Rs.25 lakh are to be paid on a pro-rata basis from the remaining funds.

8.7 Standard Operating Procedure (SOP) for handling stock exchange outage[12]

If the continuous trading on any stock exchange is disrupted due to any technical glitch, it is vital that market participants and other Market Infrastructure Institutions (MIIs) should be informed of the outage at the earliest and trading hours are extended to ensure smooth closure of intraday positions. Therefore, SEBI has laid down the SOP to handle cases of outage at any stock exchange.

- The exchange suffering from any outage (affected stock exchange) must inform SEBI immediately on occurrence of the outage through an email.
- The market participants and other MIIs must be informed immediately or at least within 15 minutes of the outage through broadcast message and by publishing on its website.
- Even if trading in one or more market segments is disrupted due to the outage, trading can continue in other segments unaffected by the outage.
- Trading can continue on other stock exchanges which are not affected by the outage.
- The affected stock exchange must try to restore normalcy of operations at the earliest, including activating its Disaster Recovery Site.
- The exchange must inform the market participants at least 15 minutes before the resumption of trading.

Extension of trading hours by stock exchanges due to outages are applicable in the following manner and the same needs to be intimated to all the market participants, MIIs and SEBI within stipulated time.

[12] Vide SEBI Circular SEBI/HO/MRD-TPD-1/CIR/P/2023/7 dated Jan 09, 2023 on Standard Operating Procedure for handling Stock Exchange outages and extension of trading hours thereof.

Scenarios	Extension of trading hours
Resumption of normal trading at least 1 hour before scheduled market closure	No change of trading hours required
Trading does not resume to normalcy within 1 hour before the scheduled market closure	All stock exchanges should extend their trading hours by one and half hours for that day
Outage happens during the last trading hour of normal operation and latest before 15 minutes of normal scheduled market closure	All stock exchanges should extend their trading hours by one and half hours for that day

Sample questions

1. On the Governing Council of the Clearing Corporation of the derivatives segment, broker-members are allowed.
(a) True
(b) **False**

2. The main objective of Trade Guarantee Fund (TGF) at the exchanges is _____.
(a) To guarantee settlement of bonafide transactions of the members of the exchange
(b) To inculcate confidence in the minds of market participants
(c) To protect the interest of the investors in securities
(d) **All of the above**

3. A penalty or suspension of registration of a stock broker from derivatives exchange/segment under the SEBI (Stock Broker) Regulations, 1992 can take place if _____.
(a) The stock broker fails to pay fees
(b) The stock broker violates the conditions of registration
(c) The stock broker is suspended by the stock exchange
(d) **In any of the above situations**

4. A defaulting member's clients' positions could be transferred to _____ by the Clearing Corporation.
(a) Another solvent member
(b) The Exchange
(c) A suspense account
(d) Error account

CHAPTER 9: ACCOUNTING AND TAXATION

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Accounting treatment for derivatives contracts
- Taxation of derivatives transaction in securities

9.1 Accounting

Accounting for Forward Contract as per Accounting Standard - 11

When forward contract is for hedging

- The premium or discount (i.e., difference between the value at spot rate and forward rate) should be amortized over the life of contract.
- Exchange difference (difference between the value of settlement date/ reporting date and value at previous reporting date/ inception of the contract) is recognized in Profit & Loss statement of the year.
- Profit/ loss on cancellation/ renewal of forward contract are recognized in P&L of the year.

When forward contract is for trading / speculation

- No premium or discount is recognized.
- A gain or loss i.e., the difference between the forward rate as per contract/ previous year end valuation rate and the forward rate available at the yearend (reporting date) for remaining maturity period should be recognized in the P&L of the period.
- Profit/ loss on cancellation / renewal of forward contract are recognized in P&L of the year.

Accounting of Equity index and Equity stock futures in the books of the client

The Institute of Chartered Accountants of India (ICAI) has issued guidance notes on accounting of index futures contracts from the view point of parties who enter into such futures contracts as buyers or sellers. For other parties involved in the trading process, like brokers, trading members, clearing members and clearing corporations, a trade in equity index futures is similar to a trade in, say shares, and does not pose any peculiar accounting problems. Hence in this section we shall largely focus on the accounting treatment of equity index futures in the books of the client.

Accounting at the inception of the contract (Accounting for Initial Margin)

- Every client is required to pay to the Trading Member/ Clearing Member, initial margin determined by the Clearing Corporation as per the bye-laws/ regulations of the Exchange for entering into equity index/stock futures contracts.
- Such initial margin paid/ payable should be debited to "Initial Margin - Equity Index/Equity stock Futures Account". Additional margins, if any, should also be accounted for in the same manner.
- It may be mentioned that at the time when the contract is entered into for purchase/ sale of equity index futures, no entry is passed for recording the contract because no payment is made at that time except for the initial margin.
- At the balance sheet date, the balance in the "Initial Margin - Equity Index/ Equity Stock Futures Account' should be shown separately under the head 'Currency Assets'.
- Where any amount has been paid in excess of the initial/ additional margin, the excess should be disclosed separately as a deposit under the head 'Current Assets'.
- Where instead of paying initial margin in cash, the Client provides bank guarantees or lodges securities with the member, a disclosure should be made in the notes to the financial statements of the Client. This will not require any accounting entry.

Deposit for Initial Margin Kept
Deposit for Initial Margin a/c Dr.
To Bank a/c

Initial Margin paid / adjusted from deposit
Initial Margin a/c Dr.
To Bank a/c/ Deposit for initial Margin a/c

Initial margin returned /released
Bank a/c /Deposit for initial margin a/c Dr.
To Initial Margin a/c

Suppose Mr. X purchases a Futures Contract on March 5, 2023. The initial margin calculated as per SPAN, is 50000. The margin for the subsequent days, calculated as per the SPAN, is as follows:

On March 6, 2023	Rs. 55,000
On March 7, 2023	Rs. 45,000
On March 8, 2023	Rs. 47,000

1. On March 5, 2023

Initial Margin – Equity Futures a/c. Dr	Rs 50,000
To Bank a/c	Rs 50,000

(Being initial margin paid on Equity Futures Contracts)

2. On March 6, 2023

Initial Margin – Equity Futures a/c. Dr	Rs 5,000
To Bank a/c	Rs 5,000

(Being additional margin paid to the Exchange)

3. On March 7, 2023

Bank a/c. Dr	Rs 10,000
To Initial Margin – Equity Futures a/c.	Rs 10,000

(Being margin refunded by the Exchange)

4. On March 8, 2023

Initial Margin – Equity Futures a/c. Dr	Rs 2,000
To Bank a/c	Rs 2,000

(Being further margin paid to the Exchange)

Accounting at the time of daily settlement - payment/receipt of MTM margin

- Payments made or received on account of Daily Settlement by the Client would be debited or credited to an account titled as "Mark-to-Market Margin - Equity Index/ Equity Stock Futures Account".
- Mark-to-Market Margin a/c can be maintained Index/ stock-wise so as to facilitate calculation of provision for loss.
- Such payment/receipt can be through a bank account or through a deposit kept with clearing member (and debited to an appropriate account say, "Deposit for Mark-to-Market Margin Account").
- At the year-end, any balance in the "Deposit for Mark-to-Market Margin Account" should be shown as a deposit under the head "Current Assets".

Deposit for Mark to Market Margin Kept
Deposit for M to M Margin a/c Dr.
To Bank a/c

M to M Margin paid /adjusted from deposit
M to M Margin a/c Dr
To Bank/Deposit for M to M Margin a/c

M to M Margin received
Bank /Deposit for M to M Margin a/c Dr.
To M to M Margin a/c

Accounting for open interests as on the balance sheet date

- Debit/Credit balance in the "Mark-to-Market Margin - Equity Index/Equity Stock Future Account" the net amount paid / received on the basis of movement in the prices of index futures till the balance sheet date.
- Keeping in view "prudence" principle, provisions should be created by a debit to the profit and loss account for anticipated loss equivalent to the debit balance in the "Mark-to-Market Margin Account".
- Net amount received (represented by credit balance in the "Mark-to-Market Margin Account") being anticipated profit should be ignored and no credit for the same should be taken in the profit and loss account.
- The debit balance in the said "Mark-to-Market Margin Account", i.e., net payment made to the broker, should be shown under the head "Current Assets, Loans and Advances" in the balance sheet and the provision created there-against should be shown as a deduction there from.
- On the other hand, the credit balance in the said account, i.e., the net amount received from the broker, should be shown as a current liability under the head "Current Liabilities and Provisions" in the balance sheet.
- Such provision shall be calculated Index wise/Stock wise that means all series of stock shall be combined.

Provision for loss on Equity Stock/ Equity Index futures outstanding at Balance sheet

Opening provision was less hence increased

Profit & Loss a/c Dr

To Provision for loss on Equity Stock/Equity Index future a/c

Opening provision was more hence decreased

Provision for loss on Equity Stock/Equity Index future a/c Dr

To Profit & Loss a/c

To illustrate:

Suppose Mr. A pays an amount of Rs 5000, as Mark-to-Market Margin on Equity Futures Contract. The following accounting entry would be made in the books of accounts:

Profit & Loss a/c Dr.	Rs 5000
To Provision for loss on Equity Futures a/c	Rs 5000

(Being provision made for the amount paid to Clearing Member/Trading Member because of movement in the prices of the futures contract)

Accounting at the time of final settlement or squaring-up of the contract

- At the expiry of a series of equity index futures, the profit/ loss, on final settlement of the contracts in the series, should be calculated as the difference between final settlement price and contract prices of all the contracts in the series.

- The profit/ loss, so computed, should be recognised in the profit and loss account by corresponding debit/ credit to "Mark-to-Market Margin Account".
- Same accounting treatment should be made when a contract is squared-up by entering into a reverse contract.
- If more than one contract in respect of the relevant series of Equity Index/ Equity Stock futures contract to which the squared-up contract pertains is outstanding at the time of the squaring up of the contract, the contract price of the contract so squared-up should be determined using weighted average method for calculating profit/ loss on squaring-up.
- On the settlement of an Equity Index/ Equity Stock futures contract, the initial margin paid in respect of the contract is released which should be credited to Initial Margin Account", and a corresponding debit should be given to the bank account or the deposit account.

If profit on Settlement /Squaring off
M to M Margin a/c Dr
To P & L a/c

If Loss on Settlement/Squaring off
P & L a/c Dr -
To M to M Margin a/c

Entry for release of Initial Margin will be:
Bank a/c /Deposit for initial margin a/c Dr
To Initial Margin a/c

Accounting in case of a default

- When a Client default in making payment in respect of Daily Settlement, the contract is closed out
- The amount not paid by the Client is adjusted against the initial margin. Excess margin if any is released and shortfall if any will be payable by the client.
- The accounting treatment in this regard will be the same as explained earlier
- The amount of profit or loss on the contract so closed out should be calculated and recognised in the profit and loss account in the manner described earlier.

Disclosure

- The amount of bank guarantee, and book value as also the market value of securities lodged should be disclosed in respect of outstanding contracts at the year end, where initial margin money has been paid by way of bank guarantee and/or lodging of securities, separately for each type of instruments.

- The number of futures contract not settled (open interests), number of contracts, number of units pertaining to those contracts as of the balance sheet date should be disclosed separately for Long and Short Positions, in respect of each of equity index/ futures i.e. index/ stock wise

Accounting for Equity Index Options in case of cash settled options

Accounting at the inception of the contract

- The seller/ writer of the option is required to pay initial margin for entering into the option contract. It should be debited to an appropriate account, say, "Equity Index/ Stock Option Margin Account". In the balance sheet, such account should be shown separately under the head "Current Assets".
- The buyer/ holder of the option is required to pay the premium. In the books of the buyer/ holder, such premium should be debited to an appropriate account, say, "Equity Index/ Stock Option Premium Account". In the books of the seller/ writer such premium received should be credited to an appropriate account, say, "Equity Index/ Stock Option Premium Account".

Accounting at the time of payment/ receipt of margin

- Payment made or received by the seller/ writer for the margin would be credited/ debited to the bank account and the corresponding debit or credit for the same should be made to "Equity Index/ Stock Option Margin Account".
- Sometimes, the client may deposit a lump sum amount with the Trading/ Clearing Member in respect of the margin instead of paying/ receiving margin on daily basis. In such a case, the amount of margin paid/ received from/ into such account should be debited/ credited to the "Deposit for margin account". At the year-end, any balance in the "Deposit for margin account" should be shown as a deposit under the head "Current Assets".
- Entries will be similar to initial margin on futures explained earlier.

Accounting for open options as on the balance sheet date

- The "Equity Index/Stock Option Premium Account" should be shown under the head 'Current Asset' or 'Current Liabilities', as the case may be.
- In case of multiple options, entries recommended above may be made in one “Equity Index/ Stock Option Premium Account”, in respect of options of all stocks. The balance of this composite account should be shown under the head "Current Assets' or "Current Liabilities", as the case may be.
- But for calculating provision for loss, Stock wise / index wise a/c is advisable.
- In the books of the buyer/ holder, a provision should be made for the amount by which the premium paid for the option exceeds the premium prevailing on the

balance sheet date since the buyer/ holder can reduce his loss to the extent of the premium prevailing in the market, by squaring off the transaction.

- The excess of premium prevailing in the market on the balance sheet date over the premium paid is not recognised on the consideration of prudence,
- The provision so created should be credited to "Provision for Loss on Equity Index/ stock Option Account". The provision made as above should be shown as deduction from "Equity Index/ stock Option Premium" which is shown under 'Current Assets'.
- In the books of the seller/ writer, the provision should be made for the amount by which premium prevailing on the balance sheet date exceeds the premium received for that option.
- The excess of premium received over the premium prevailing on the balance sheet date is not recognised on the consideration of prudence.
- This provision should be credited to "Provision for Loss on Equity Index/ Stock Option Account", with a corresponding debit to profit and loss account. "Equity index/stock Options Premium Account" and "Provision for Loss on Equity Index/ Stock Options Account" should be shown under 'Current Liabilities and Provisions'.
- In case of multiple open options at the year-end, a Stockwise / lndexwise provision should be made considering all the open options of any strike price and any expiry date under that stock/ Index taken together.
- Profit/Loss on bought and sold position of each stock be adjusted and if net result is loss make provision and if net result is gain ignore it.
- The amount of provision required in respect of each stock or index should be aggregated and a composite "Provision for Loss on Equity Stock/ Index Options Account" should be credited by debiting P&L a/c.
- In case any opening balance in such provision account is there the same should be adjusted against the provision required in the current year and the profit and loss account be debited/ credited with the balance provision required to be made/excess provision written back.

Accounting at the time of final settlement

In the books of the buyer/ holder:

- The buyer/ holder will recognise premium as an expense in the profit and loss account.
- On exercise of the option, the buyer/ holder will receive favourable difference, between the final settlement price as on the exercise/expiry date and the strike price, which will be recognised as income.

In the books of the seller/writer:

- The seller/writer will recognise premium as an income in the profit and loss account.
- On exercise of the option, the seller/writer will pay the adverse difference, between the final settlement price as on the exercise/ expiry date and the strike price. Such payment will be recognised as a loss.
- As soon as an option gets exercised, margin paid towards such an option will be released by the exchange, which should be credited to "Equity Index/ stock Option Margin Account" and the bank account will be debited.

Accounting at the time of squaring off of an option contract

- The difference between the premium paid and received on the squared off transactions should be transferred to the profit and loss account.
- Accounting treatment is the same as above in the books of the seller/ writer for margin money released on the squaring off of an option contract.
- For working out profit or loss in case of outstanding multiple options of the same stock / index with the same strike price and the same expiry date, weighted average method should be followed on squaring off of transactions or is/ are exercised before the expiry date.

Accounting treatment in respect of equity stock options in case of delivery settled options

- The accounting entries at the time of inception, payment/receipt of margin and open options at the balance sheet date will be the same as those in case of cash settled options.
- At the time of final settlement, if an option expires unexercised then the accounting entries will be the same as those in case of cash settled options.
- If the option is exercised, then shares will be transferred in consideration for cash at the strike price. In such a case, the accounting treatment will be as recommended in the following paragraphs.

In case of buyer/holder:

- For a call option the buyer/ holder will receive equity shares for which the call option was entered into. The buyer/ holder should debit the relevant equity shares account and credit cash/ bank.
- For a put option buyer/ holder will deliver equity shares for which the put option was entered into. The buyer/ holder should credit the relevant equity shares account and debit cash/ bank.

In case of seller/writer:

- For a call option the seller/ writer will deliver equity shares for which the call option was entered into. The seller/ writer should credit the relevant equity shares account and debit cash/ bank.
- For a put option the seller/ writer will receive equity shares for which the put option was entered into. The seller/ writer should debit the relevant equity shares account and credit cash/ bank.
- In addition to this entry, the premium paid/received will be transferred to the profit and loss account, the accounting entries for which should be the same as those in case of cash settled options.

Disclosure

- The enterprise should disclose the accounting policies and the methods adopted, including criteria for recognition and the basis of measurement applied for equity index options and equity stock options.
- Where initial margin is paid by way of bank guarantee and/or lodging of securities, the amount of such bank guarantee/ book value and market value of securities in respect of outstanding options at the year end.
- The buyer/holder and the seller/ writer of the option should give the following details in respect of the option contracts outstanding as at the year-end for each Equity Index/ Stock Option.

Accounting for Equity Stock Options

Accounting for Equity Stock Options which are settled in Cash

- Accounting entries for Equity Stock Options settled in cash will be the same as that in the case of Equity Index Options.
- This is because in both the cases the settlement is done otherwise than by delivery of the underlying assets.

Accounting for Equity Stock Options which are settled by delivery

Accounting entries at the time of inception, daily receipt/ payment of margin and open options at the balance sheet date will be the same as that in the case of cash settled options.

9.2 Taxation of derivative transaction in securities

Taxation of Profit/Loss on derivative transaction in securities

Gains or losses arising from transactions in derivatives on exchanges are taxable under the head 'Profits and Gains from Business or Profession'. Business gains or losses are classified either as non-speculative or speculative income. Any loss arising from speculative business can only be set off against gains from a speculative business. Prior

to Financial Year 2005–06, transaction in derivatives were considered as speculative transactions for the purpose of determination of tax liability under the Income Tax Act. This is in view of section 43(5) of the Income-tax Act which defined speculative transaction as a transaction in which a contract for purchase or sale of any commodity, including stocks and shares, is periodically or ultimately settled otherwise than by the actual delivery or transfer of the commodity or stocks. In view of the above provisions, most of the transactions entered into in derivatives by investors and traders were considered as speculative transactions. The tax provisions provided for differential treatment with respect to set off and carry forward of loss on such transactions. During that period, loss on derivative transactions could be set off only against other speculative income and the same could not be set off against any other income. This resulted in payment of higher taxes by an assessee.

Finance Act, 2005 has amended section 43(5) so as to exclude transactions in derivatives carried out in a "recognized stock exchange" for this purpose. This implies that income or loss on derivative transactions which are carried out in a "recognized stock exchange" is not taxed as speculative income or loss. Thus, loss on derivative transactions can be set off against any other income during the year (except salary income). In case the same cannot be set off, it can be carried forward to subsequent assessment year and set off only against any other non-speculative business income of the subsequent year. Such losses can be carried forward for a period of 8 assessment years. However, the assessee enjoys the right to carry forward and set off unabsorbed losses from derivatives transactions only when the return of income has been filed on or before the due date. It may also be noted that securities transaction tax paid on such transactions is eligible as deduction under Income Tax Act, 1961.

In the case of Foreign Portfolio Investors (FPIs), the gains or losses arising from derivatives transactions on a recognized stock exchange are taxable under the head 'Capital Gains'. Since a majority of the derivatives contracts traded on the stock exchanges have a maturity up to 3 months, the gains or losses arising from F&O trades are generally taxable as short-term capital gains or losses.

Any income from F&O trading can be offered for taxation either under the normal scheme of taxation or under the presumptive scheme of taxation under Section 44AD (if the total turnover does not exceed Rs.2 crores). Under the presumptive scheme of taxation, gains from derivatives trading are assessed at the rate of 6 per cent of the turnover without allowing any tax deductions for expenses.

Cases When Tax Audit Is Mandatory	*Cases When Tax Audit Is Not Required*
If turnover exceeds Rs 10 Crore, regardless of profit or loss, under section 44AB(a).	F&O turnover is below ₹2 crore, and you declare profits of at least 6% or more of turnover under Section 44AD
If Turnover is between ₹2 Crore and ₹10 Crore without presumptive taxation and profits are less than 6% of turnover.	If Turnover is between ₹2 Crore and ₹10 Crore and more than 95% of transactions are digital, a tax audit is not necessary, regardless of profit or loss (Section 44AB).

Securities Transaction Tax (STT)

STT is the Securities Transaction Tax that is levied on every purchase and sale of securities that are listed on the Indian stock exchanges. STT is levied on transactions involving equity, derivatives and equity oriented mutual funds. In case of derivatives transactions, the exchange on which the transaction took place is required to collect (deduct) the STT and remit the same to the Government. Traders have to pay securities transaction tax on the derivatives transactions executed on a recognized exchange as per the rates given below:

Taxable securities transaction	**STT rate**	**Payable by**
Sale of an option in securities	0.10 per cent	Seller
Sale of an option in securities, where option is exercised	0.125 per cent	Purchaser
Sale of a futures in securities	0.02 per cent	Seller

Value of taxable securities transaction relating to an "option in securities" shall be the option premium, in case of sale of an option in securities. Value of taxable securities transaction relating to an "option in securities" shall be the settlement price, in case of sale of an option in securities, where option is exercised. Where a derivative contract is being settled by physical delivery of shares (i.e., in case of physical settlement), such transaction would be similar to a transaction in equity shares where the contract is settled by actual delivery of shares. Therefore, the STT rate as applicable to delivery based equity transactions would apply to such derivative transactions too (STT for delivery based equity transaction is 0.1 per cent, payable by both the seller and the purchaser).

Exchanges adopt the following procedure in respect of the calculation and collection of Securities Transaction Tax:

- STT is applicable on all sell transactions for both futures and option contracts.
- For the purpose of STT, each futures trade is valued at the actual traded price and option trade is valued at premium. On this value, the STT rate as prescribed is applied to determine the STT liability. In case of voluntary or final exercise of an

option contract, STT is levied on settlement price on the day of exercise if the option contract is in the money.

- STT payable by the clearing member is the sum total of STT payable by all trading members clearing under him. The trading member's liability is the aggregate STT liability of clients trading through him.

Sample questions

1. Profits from derivatives transactions for Indian investors are taxed as: _____.
(a) Speculative income under the head 'profits and gains of business or profession'
(b) Short term capital gains under the head 'capital gains'
(c) Non-speculative income under the head 'income from other sources'
(d) **Non-speculative income under the head 'profits and gains of business or profession'**

2. In the case of Foreign Portfolio Investors (FPIs), the gains or losses arising from derivatives transactions on a recognized stock exchange are taxable as:

(a) Long-term capital gains
(b) Short term capital gain
(c) Speculative gains
(d) Income from other Sources

CHAPTER 10: SALES PRACTICES AND INVESTORS PROTECTION SERVICES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Importance of understanding client risk profile and Risk Disclosure Document
- Client Identification procedure
- Due Diligence process for customers
- Documents required under KYC process
- Suspicious Transaction Reporting
- Investor Grievance Redressal Mechanism
- SEBI Complaints Redress System

The finance sector has an important role to play in an economy. It has the responsibility of ensuring stable markets and supporting the real economy. The primary function of a financial institution is to provide sustainable financial services. Giving good advice and having excellent customer service is a precondition for long-term success of any financial institution.

Financial Institutions should have a customer-oriented approach, where sales of products are customer led and always accompanied by correspondingly efficient and appropriate advice. It can be summarily stated that: “Customers have the right to get good advice; employees of financial services firms have the duty to give good advice.”

A favourable model should be developed in cooperation between company, its employees and intermediaries in the finance sector to ensure the best possible framework for increasing customer satisfaction.

In the recent past, naïve investors have increasingly become targets of financial abuse and fraud. Investors should be cautious while investing in any of the financial products in the market. Some of the areas where investor needs to be careful about his investments are discussed below:

“High Return” or "Risk-Free" Investments

Investors should be careful of opportunities that promise spectacular profits or "guaranteed" returns. The deal sounds too good to resist. An individual may claim that unrealistic returns can be realized from "Low-Risk Investment Opportunities", but one has to keep in mind no investment is risk-free. Returns are related to the risk taken and hence there cannot be a product in the market that gives high return in risk free manner.

Investment Advisor Services

An Investment advisor is an individual or firm responsible for making investments on behalf of, and/or providing advice to, investors. He has a duty to act in the best interest

of the clients. However, investors also should review their monthly account statements and to conduct annual reviews of their investment plans with their investment adviser. Investors should be watchful for any abnormal changes in their monthly account statements.

Unsuitable Investment Recommendations

An investor should be careful about the suitability of investment products that are being suggested/sold to him with his specific investment objectives. Some unscrupulous intermediaries may try to sell certain investment products that does not meet the investment objectives and risk profile of that particular investor. An example of an unsuitable recommendation is a stock broker advising a senior citizen with low risk tolerance to deal in futures, options, or penny stocks. Investors should be careful to review the associated risk of each investment recommendation.

Churning

"Churning" refers to when securities professionals making unnecessary and excessive trades in customer accounts for the sole purpose of generating commissions. Investors should be careful to review their monthly account statements and investigate any abnormally high trading activity.

Investor Seminars

At some of the investor seminars, advisers may pitch unsuitable products. Investors should avoid making rushed decisions in such situations and should seek objective third-party advice before committing their funds.

As sales become an integral part in financial services, proper advice to the customers is important.

Contact with customers

- Sales Agents must only make sales calls on customers at reasonable times recognizing that what is regarded as reasonable can vary in different locations and in different types of households. Sales Agents will in any event only call between 9 am and 8 pm, unless it is at the customer's request.
- Sales Agents should, as soon as possible on making contact, identify themselves, the company they represent and their purpose.
- Sales Agents should take account of the customer's personal circumstances and, as a minimum, comply with diversity obligations.
- Sales Agents must end the discussion and leave the premises immediately at the customer's request.
- Sales Agents must voluntarily cease contact with a customer who clearly indicates that contact is inconvenient, unwelcome or inappropriate.

- A contact number must be left with any customer, on request.
- Sales Agents must not exploit a person's inexperience, vulnerability, credulity or loyalties.
- Members must maintain records, including the date of contact with the customer to allow the subsequent identification of the sales agent involved. This will assist in dealing with any complaint or query.
- Sales agents must at all times:
    - Be courteous and professional.
    - Shall refrain from making false assumptions, in particular over potential returns on their investments.
    - Avoid the use of high pressure/ luring tactics.

10.1 Understanding risk profile of the client

In the context of investments, "risk" refers not only to the chance that a person may lose his capital but more importantly to the chance that the investor may not get the desired return on an investment vehicle. People invest in various investment products that generally comprise:

- Fixed Income Instruments, and
- Market oriented investments.

In the case of former, with a definite interest rate, there is little "risk" of not being able to get the desired returns (credit or default risk exists though) but in the case of the latter, an investor has an expectation of a certain amount of return and the term "risk" in this context refers to the probability of the investor not getting the desired /expected returns.

A financial advisor should have a thorough understanding of risk. There is a risk/ return trade-off. That is, the greater the risk accepted, the greater must be the potential return as reward for committing one's funds to an uncertain outcome. Generally, as the level of risk rises, the expected rate of return should also rise, and vice versa.

A risk-averse investor would prefer investments that are more secure and thus would have higher portfolio allocations to debt and fixed income instruments. On the other hand, an investor who is less risk averse would like to have greater exposure to equity and other risky investments.

There is a need to understand risk tolerance for a variety of reasons, some of which are specified below:

- To achieve a level of financial independence that allows investors to meet not only their basic needs, but also higher-level needs for self-development and self-improvement in their life.

- Willingness to accept a certain smaller return rather than a large but uncertain profit from their financial decisions.
- The individual's evaluations of their self-worth and their levels of self-esteem are related to their levels of satisfaction with their financial situation.
- Individuals need to appreciate their personal comfort zone when they trade-off what they are willing to accept in terms of possible losses versus possible gains.
- An investor's objectives are often poorly developed and unrealistic in terms of investments.
- It is often difficult for people to describe in their own words their attitudes about risk.
- There is a good chance that new investors, may not understand many of the financial and risk concepts presented by advisors.
- It is very difficult for the financial advisor to arrive at an accurate risk profile.
- Single Investment model will fit all-lifecycle approach does not work.

Some of the key parameters on which one's risk tolerance can depend are: age, personal income, combined family income, number of dependents, occupation, marital status, education, existing liabilities and access to other inherited sources of wealth.

Financial advisors need to know about the period for which investors plan to invest. The objectives of the investors should be made clear to give proper advice and meet his short term as well as long term needs. The longer the investment horizon, the more risk can be integrated into his financial expectations about the investments.

10.2 Risk Disclosure Document

Globally, as well as in India, it is well established, on the basis of track record of performance that equities as a class of asset has outperformed other asset classes and delivered superior returns over longer periods of time. With these statistics available, why wouldn't everyone at all times invest 100 percent in stocks? The answer is, of course, that while stocks have outperformed over the long term, there have been many instances in which stocks have underperformed in the short run, and in fact, have had negative returns. It is difficult to exactly predict these periods of underperformance and thus, there is more risk in owning stocks if one has a short horizon than if one has a long investment horizon.

The Risk Disclosure Document highlights the risk involved in trading on stock exchanges, and the rights and obligations of the broker and their clients. Brokers are required to make their clients understand the risks involved in trading derivatives and get a copy of the Risk Disclosure Document signed by their clients at the time of client on-boarding. The risk and complexity vary among derivative products. While some derivatives are relatively simple,

many others, especially options and their combinations, can get very complex and require additional safeguards from investors' viewpoint. Options are a more complex derivative product than the futures because evaluating the fairness of option premium is difficult. The main risks involved in trading in the equity derivatives market include:

(a) Market risk: This is the risk of the market or the stock price moving in an unfavourable direction and causing a loss to the investor.

(b) Liquidity risk: This is the risk arising out of the investor's inability to liquidate a loss-making position. For example, trading volumes in stock futures and options typically fall as the contracts near their expiry date and clients holding positions in such contracts may find it difficult to close the positions.

(c) Counterparty risk: This is the risk arising out of the default of a counterparty to the transaction. It is generally not applicable to clients trading in exchange-traded equity derivatives because the settlement of such transactions is guaranteed by the exchange / clearing corporation.

The above risks are heightened in the case of equity derivatives because of the 'leveraged' nature of derivative contracts. Clients trading in futures contracts have to deposit a margin with their broker but this is only a fraction of the entire contract value. Similarly, clients trading in options are required to pay the option premium, which is again, a small amount relative to the size of the contract. The small initial capital outlay required for trading equity derivatives can encourage some clients to build up large derivatives positions, which may be beyond their risk tolerance. Such clients stand to lose large amounts in case the market turns unfavourable. Some risks which are specific to clients trading in futures and options are discussed below:

Risks to clients trading in futures contracts: Futures contracts are marked to market and settled on a daily basis. In the case of an unfavourable market movement, the client will be required to deposit the amount of notional loss resulting from the unfavourable movement. If this amount is not deposited within the stipulated time, the broker may liquidate the client's position wholly or in part and the client will be liable to pay up the resulting losses. Futures traders face the risk of sudden increase in the margin rates during periods of volatility. Yet another risk is the inability to execute trades or close out positions during volatile periods, when the liquidity dries up.

Risks to option buyers: Options are a wasting asset. Option buyers must pay the premium when they buy an option. If the price of the underlying stock or index does not change in the anticipated direction before the expiry date of the option, the option will become worthless on the expiry date. In such a case, if the option buyer does not close out his

option position prior to the expiry date, he is exposed to the risk of losing the entire or a large part of the option premium within a short span of time.

Risk to option sellers: Option sellers or writers face the risk of losing a substantial amount in case the price of the underlying stock or index moves in an unfavourable direction. Unlike the option buyers whose losses are limited to the amount of premium they have already paid, the option seller's risk is unlimited. The option seller can lose many times the amount of premium he has collected for selling the option.

All clients trading in derivatives are exposed to the risk of higher volatility, which can cause large swings in the prices of derivatives contracts. Such price swings are more common in thinly traded derivatives contracts. As a result of high volatility, the client's order may not get executed or may be only partially executed, thus causing large losses.

Clients should also be cautioned against the possibility of their orders not getting executed on time or getting only partially executed because of a system glitch or communication failure or slow or delayed response from the system. Any such delayed response or non-execution of orders may result in substantial losses on the clients' open positions.

It is essential that broker-client relationship and sales practices for derivatives need regulatory focus. The potential risk involved in trading (as opposed to hedging) with derivatives is not understood widely. In the case of pricing of complex derivatives contracts, there is a real danger of unethical sales practices. Clients may be fleeced or induced to buy unsuitable derivative contracts at unfair prices and without properly understanding the risks involved. That is why it has become a standard practice for broker/ dealer to issue a "risk disclosure document" to every client while opening their accounts for various exchange traded derivatives segments.

Also, derivatives brokers/ dealers are expected to know their clients and to exercise care to ensure that the derivative product being sold by them to a particular client is suitable to his understanding and financial capabilities.

Derivatives brokers/ dealers should avoid recommending futures and options to a client, unless they have a reasonable basis for believing that the customer has such knowledge and financial experience that he or she is capable of evaluating, and financially able to bear, the risks of the transaction.

The broker-dealer must seek to obtain and verify specific categories of information about its customers including, but not limited to, their net worth, annual income and investment experience and knowledge. Brokers must ensure that investors are given a detailed explanation of the special characteristics and risks applicable to the trading of derivative products.

The disclosure document about derivative products contains information describing the mechanics and risks of derivatives trading, transaction costs, margin requirements and tax consequences of margin trading.

In view of the increasing participation of retail or individual investors in the equity futures and options segment, there is a need to ensure informed decision-making by such investors after due consideration of the risks involved in the trading of equity derivatives. Hence, in addition to the usual practice of issuing a Risk Disclosure Document while opening a new client's account, brokers are now required to display certain 'Risk Disclosure' facts on their websites. These facts should pop up on the screen whenever clients log in to their trading account with the broker. The client should be allowed to proceed only after acknowledging these facts. These Risk Disclosure facts are an outcome of a study published by SEBI in January 2023, based on annual profits and losses incurred by individual traders in equity futures and options during F.Y. 2021-22, and are listed below:

1. 9 out of 10 individual traders in equity Futures and Options Segment, incurred net losses.
2. On an average, loss makers registered net trading loss close to ₹ 50,000.
3. Over and above the net trading losses incurred, loss makers expended an additional 28% of net trading losses as transaction costs.
4. Those making net trading profits, incurred between 15% to 50% of such profits as transaction cost.

Brokers must now maintain the Profit and Loss data of their individual clients (including HUFs and NRIs, but excluding proprietary traders, institutions, partnership firms etc.) on a continuous basis in a prescribed format and retain such data for at least five years. Stock exchanges and Depositories must display the Risk Disclosure facts on their websites along with a link to the study conducted by SEBI.

10.3 Written Anti Money Laundering Procedures

The term money-laundering offense 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". The Prevention of Money-Laundering Act, 2002 (PMLA), is an act to prevent money-laundering and to provide for confiscation of property derived from, or involved in, money-laundering and for related matters.

Each registered intermediary should adopt written procedures to implement the anti-money laundering provisions as envisaged under the Anti Money Laundering Act, 2002. Such procedures should include inter alia the following three specific parameters which are related to the overall 'Client Due Diligence Process':

- Policy for acceptance of clients
- Procedure for identifying the clients
- Transaction monitoring and reporting especially Suspicious Transactions Reporting (STR)

Customer Due Diligence

The customer due diligence ("CDD") measures comprise the following:

- Obtaining sufficient information in order to identify persons who beneficially own or control securities account. Whenever it is apparent that the securities acquired or maintained through an account are beneficially owned by a party other than the client, that party should be identified using client identification and verification procedures. The beneficial owner is the natural person or persons who ultimately own, control or influence a client and/or person on whose behalf a transaction is being conducted. It also incorporates those persons who exercise ultimate effective control over a legal person or arrangement.
- Verify the customer's identity using reliable, independent source documents, data or information;
- Identify beneficial ownership and control, i.e. determine which individual(s) ultimately own(s) or control(s) the customer and/ or the person on whose behalf a transaction is being conducted;
- Verify the identity of the beneficial owner of the customer and/or the person on whose behalf a transaction is being conducted, corroborating the information provided in relation to person; and
- Conduct ongoing due diligence and scrutiny, i.e. perform ongoing scrutiny of the transactions and account throughout the course of the business relationship to ensure that the transactions being conducted are consistent with the registered intermediary's knowledge of the customer, its business and risk profile, taking into account, where necessary, the customer's source of funds.

Policy for acceptance of clients

All registered intermediaries should develop customer acceptance policies and procedures that aim to identify the types of customers that are likely to pose a higher than the average risk of money laundering or terrorist financing. By establishing such policies and procedures, they will be in a better position to apply customer due diligence on a risk sensitive basis depending on the type of customer business relationship or

transaction. In a nutshell, the following safeguards are to be followed while accepting the clients:

- No account is opened in a fictitious/benami name or on an anonymous basis.
- Factors of risk perception (in terms of monitoring suspicious transactions) of the client are clearly defined having regard to client's location (registered office address, correspondence addresses and other addresses if applicable), nature of business activity, trading turnover, etc. and manner of making payment for transactions undertaken. The parameters should enable classification of clients into low, medium and high risk. Clients of special category may, if necessary, be classified even higher. Such clients require higher degree of due diligence and regular update of KYC profile.
- Documentation requirement and other information to be collected in respect of different classes of clients depending on perceived risk and having regard to the requirement to the Prevention of Money Laundering Act 2002, guidelines issued by RBI and SEBI from time to time.
- Ensure that an account is not opened where the intermediary is unable to apply appropriate clients due diligence measures/KYC policies. This may be applicable in cases where it is not possible to ascertain the identity of the client, information provided to the intermediary is suspected to be non-genuine, perceived non-cooperation of the client in providing full and complete information. The market intermediary should not continue to do business with such a person and file a suspicious activity report. It should also evaluate whether there is suspicious trading in determining in whether to freeze or close the account. The market intermediary should be cautious to ensure that it does not return securities of money that may be from suspicious trades. However, the market intermediary should consult the relevant authorities in determining what action it should take when it suspects suspicious trading.
- The circumstances under which the client is permitted to act on behalf of another person/entity should be clearly laid down. It should be specified in what manner the account should be operated, transaction limits for the operation, additional authority required for transactions exceeding a specified quantity/value and other appropriate details. Further the rights and responsibilities of both the persons (i.e., the agent- client registered with the intermediary, as well as the person on whose behalf the agent is acting should be clearly laid down). Adequate verification of a person's authority to act on behalf the customer should also be carried out.
- Necessary checks and balance to be put into place before opening an account so as to ensure that the identity of the client does not match with any person having

known criminal background or is not banned in any other manner, whether in terms of criminal or civil proceedings by any enforcement agency worldwide.

Risk based approach

It is generally recognized that customers may be of a higher or lower risk category depending on circumstances such as the customer's background, type of business relationship or transaction, etc. As such, the registered intermediaries should apply each of the customer due diligence measures on a risk sensitive basis. The basic principle enshrined in this approach is that the registered intermediaries should adopt an enhanced customer due diligence process for higher risk categories of customers. Conversely, a simplified customer due diligence process may be adopted for lower risk categories of customers. In line with the risk-based approach, the type and amount of identification information and documents that registered intermediaries should obtain necessarily depend on the risk category of a particular customer.

Clients of special categories (CSC)

Such clients include the following:

- Non-resident clients.
- High Net-worth clients.
- Trust, Charities, NGOs and organizations receiving donations.
- Companies having close family shareholdings or beneficial ownership.
- Politically exposed persons (PEP) of foreign origin.
- Current / Former Head of State, Current or Former Senior High-profile politicians and connected persons (immediate family, Close advisors and companies in which such individuals have interest or significant influence).
- Companies offering foreign exchange offerings.
- Clients in high risk countries (where existence / effectiveness of money laundering controls is suspect, where there is unusual banking secrecy, Countries active in narcotics production, Countries where corruption (as per Transparency International Corruption Perception Index) is highly prevalent, Countries against which government sanctions are applied, Countries reputed to be any of the following – Tax -Havens / sponsors of international terrorism, offshore financial centres, countries where fraud is highly prevalent.
- Non-face to face clients.
- Clients with dubious reputation as per public information available.

The above list is only illustrative, and the intermediary should exercise independent judgment to ascertain whether new clients should be classified as CSC or not.

Client Identification Procedure

- The 'Know your Client' (KYC) policy should clearly spell out the client identification procedure to be carried out at different stages i.e., while establishing the intermediary – client relationship, while carrying out transactions for the client or when the intermediary has doubts regarding the veracity or the adequacy of previously obtained client identification data.
- The client should be identified by the intermediary by using reliable sources including documents/information. The intermediary should obtain adequate information to satisfactorily establish the identity of each new client and the purpose of the intended nature of the relationship.
- The information should be adequate to satisfy competent authorities (regulatory / enforcement authorities) in future that due diligence was observed by the intermediary in compliance with the Guidelines. Each original document should be seen prior to acceptance of a copy.
- Failure by a prospective client to provide satisfactory evidence of identity should be noted and reported to the higher authority within the intermediary.
- SEBI has prescribed the minimum requirements relating to KYC for certain class of the registered intermediaries from time to time. Taking into account the basic principles enshrined in the KYC norms which have already been prescribed or which are prescribed by SEBI from time to time, all registered intermediaries should frame their own internal guidelines based on their experience in dealing with their clients and legal requirements as per the established practices. Further, the intermediary should also maintain continuous familiarity and follow-up where it notices inconsistencies in the information provided. The underlying principle should be to follow the principles enshrined in the PML Act, 2002 as well as the SEBI Act, 1992 so that the intermediary is aware of the clients on whose behalf it is dealing.

Documents to be obtained from customers for Customer Identification Procedure under KYC

1. Accounts of Individuals

Legal name and any other names used supported by documents given below:
(i) PAN card (mandatory), (ii) Passport, (iii) Voter's Identity Card, (iv) Driving License, (v) Aadhaar Card, (vi) Job Card issued by NREGA duly signed by an officer of the State Government, (vii) The letter issued by the Unique Identification Authority of India (UIDAI) containing details of name, address and Aadhaar number, (viii) Letter from a recognized public authority or public servant verifying the identity and residence of the customer.

Correct Permanent Address supported by any of the following documents:

(i) Aadhaar card, (ii) Passport, (iii) Driving licence, (iv) Voter ID card, (v) Bank account statement, (vi) Ration card, (vii) Telephone bill, Electricity bill or Gas bill, (viii) Letter from a recognized public authority.

2. Accounts of Company

- Name of the company
- Principal place of business
- Mailing address of the company
- Telephone/Fax number

Documents Required:
(i) Certificate of incorporation and Memorandum & Articles of Association, (ii) Resolution of the Board of Directors to open an account and identification of those who have authority to operate the account, (iii) Power of Attorney granted to its managers, officers or employees to transact business on its behalf, (iv) Copy of PAN allotment letter, (v) Copy of the telephone bill.

3. Accounts of Partnership Firms

- Legal name
- Address
- Names of all partners and their addresses
- Telephone numbers of the firm and partners

Documents required:
(i) Registration certificate, if registered, (ii) Partnership deed, (iii) Power of Attorney granted to a partner or an employee of the firm to transact business on its behalf, (iv) Any officially valid document identifying the partners and the persons holding the Power of Attorney and their addresses, (v) Telephone bill in the name of firm/partners.

In-person Verification

This is compulsory for opening a trading or demat account with a broker. It can be through physical verification, i.e., the broker's KYC staff visits the customer at the address stated in the KYC form. Verification can also be online, using a webcam at the broker's office. Video In-person verification is available for individuals doing e-KYC. In-person verification is not required when: (i) KYC of the investor is completed using the Aadhaar authentication/ verification of UIDAI, or (ii) KYC form has been submitted online, documents have been provided through DigiLocker or any other source which can be verified online.

e-KYC process

The entire KYC process can be either completed offline (i.e., face-to-face) or online. SEBI has issued detailed guidelines for e-KYC process. According to the e-KYC process, an

investor fills the account opening form online on the broker's website or digital platform or app, submits scanned proofs of the proof of identity and proof of address, completes the In-person verification on video call and digitally signs the document.

Unique Client Code

After the completion of the KYC process, the broker allots a Unique Client Code (UCC) to the client who is being on-boarded. The UCC is linked to the PAN of the client and serves as an exclusive identification of the client. The UCC requirement was introduced in order to facilitate maintaining database of clients and to strengthen the KYC norms. The broker is required to upload the UCC details to the stock exchanges/clearing corporation. The client's trading account is activated only after the UCC is generated and mapping of the UCC with the client's name, address and other details in the KYC form is completed.

In the past there have been many instances of the broker diverting or misappropriating a client's securities. As one of the measures to detect such diversion of securities, SEBI has asked stock exchanges and depositories to map the clients' UCC with their demat accounts. This simplifies the reconciliation of any mismatch between securities pay-in and pay-out generated by the clearing corporation and the actual transfer of securities by the depositories.

Digital KYC to Persons with Disabilities[13]

The Hon'ble Supreme Court of India in a judgement dated April 30, 2025, emphasized the need for easy access to financial services for persons with disabilities. Accordingly, intermediaries dealing in derivatives must ensure that the process of digital KYC is accessible to persons with disabilities.

Intermediaries shall ensure that:

- An account can be opened with the signature of a guardian;
- eKYC is available for persons with disabilities.
- eKYC requires the applicant to blink his / her eyes as proof of liveliness. A blind person who cannot perform this "proof of liveliness test" should not be denied benefits of eKYC. For such investors, intermediaries may use alternate parameters such as facial expressions, nodding of head, client showing OTP while being clearly visible on screen, real time video recording and displaying copies of documents on the screen etc.

Suspicious Transaction Reporting

Under the Anti-Money Laundering (AML) and Combating of Financial Terrorism (CFT) regulations, certain transactions are required to be reported to the Financial Intelligence

[13] https://www.sebi.gov.in/sebi_data/faqfiles/may-2025/1747995205392.pdf

Unit – India (FIU-IND) set up by the Government to detect possible attempts at money laundering. For deciding whether a transaction is suspicious, the broker must be guided by the definition of a suspicious transaction under the PMLA rules. Some examples of suspicious transactions are as follows:

- Clients whose identity verification seems difficult or clients that appear not to cooperate
- Asset management services for clients where the source of the funds is not clear or not in keeping with clients' apparent standing / business activity
- Substantial increases in business without apparent cause
- Clients transferring large sums of money to or from overseas locations with instructions for payment in cash
- Attempted transfer of investment proceeds to apparently unrelated third parties

According to the STR regulations, any suspicious transaction must be immediately notified to the Money Laundering Control Officer or other designated officer within the intermediary. However, it must be ensured that dealing with the client is continued as normal until told otherwise. The client must not be told of the report/ suspicion. Operation of the client's account may be discontinued, and transactions may be suspended, or other action taken only in exceptional circumstances. The Principal Officer/ Money Laundering Control Officer and other compliance, risk management and related staff members must have timely access to client identification data and customer due diligence (CDD) information, transaction records and other relevant information.

10.4 Investors Grievance Redressal Mechanism

Investor Grievance Redressal Mechanism / Investor Service Department is a very important department and is considered as a key regulatory function of SEBI in terms of monitoring exchanges under SECC Regulation 2012. Further, having a proper mechanism of investor grievance redressal is a must and is an ongoing condition for eligibility of membership of the Exchange under Brokers Regulation 1992.

Investors can approach the Investors Grievance Division (IGD) of the exchange for redressal of their grievances. The Exchange has a mechanism of resolving disputes by coordinating with the member and the complainant. Exchanges generally entertain complaints against trading members in respect of the following:

1. Non-receipt of documents such as member-client agreement, contract notes, settlement of accounts, order trade log, etc.
2. Non-refund of margin money
3. Trades executed without adequate margins
4. Delay or non-receipt of funds

5. Squaring up of positions without consent or not squaring up of position led to settlement at unfavourable FSP
6. Unauthorized transaction in the account
7. Trades done not as per price limit directed over phone
8. Trading error in relation to timing of order entry, missing favourable prices, error in trades, etc.
9. Servicing issues which may relate to online transaction, offline transaction, confirmation of trades, accounts, calculation of realized / unrealized gain in summary statement, etc.

Guidelines for filing complaints:

1) Clients should first send the complaint against concerned Member to the Exchange with whom the respective member is registered and then to SEBI.
2) Complaint can be in writing in English or Hindi or in any regional language and shall be duly signed by the client.
3) No fee is chargeable on such complaints.
4) Frivolous or vexatious complaints which are vague, anonymous or pseudonymous or trivial in nature are not entertained.

The investor should first approach the concerned exchange/intermediary against whom there is a complaint. If the response received is not satisfactory, then investors can approach SEBI through SCORES. SEBI Complaints Redressal System (SCORES) is a web based centralized grievance redress system of SEBI. Complaints can be made online and acknowledgement is generated instantaneously acknowledging the receipt of complaint and allotting a unique complaint registration number to the complainant for future reference and tracking. The complaint is forwarded online to the entity concerned for its redressal and the entity concerned should upload an Action Taken Report (ATR) on the complaint. The entity must resolve the complaint within 21 days after receiving intimation from SEBI under SCORE.

10.4.1 Online Dispute Resolution in the Indian Securities Market: Leveraging the Digital Transformation

The Online Dispute Resolution (ODR) Portal represents a transformative step in resolving disputes within the Indian Securities Market. Initiated by the Securities and Exchange Board of India (SEBI), this innovative platform is designed to efficiently address and resolve conflicts between investors and market participants using modern digital solutions. This guide provides an in-depth exploration of how the ODR platform operates and guides clients through lodging and resolving grievances.

10.4.2 The Purpose and the Overview of the ODR Portal

The SMARTODR Portal has been established by the Market Infrastructure Institutions (MIIs) to provide a centralized, accessible, and efficient means of resolving disputes related to the activities of listed companies, stock brokers, depository participants, and other entities regulated by SEBI. By leveraging online conciliation and arbitration methods, this portal aims to enhance the transparency and speed of dispute resolution processes, which were previously more fragmented and slower due to physical and procedural constraints.

The ODR Platform is the go-to solution for various grievances investors might encounter. Whether it's a service-related complaint, a trade discrepancy, or an issue related to non-compliance with the regulatory frameworks by market participants, this platform has got all such grievances of the investors covered, to be resolved. The resolution process is comprehensive, starting from the initial grievance filing and potentially leading to arbitration if initial conciliation efforts fail.

Here’s a detailed look at the types of grievances that the ODR platform addresses:

1. Service-Related Complaints

These complaints encompass a variety of issues that clients might encounter with the services provided by market participants. Examples include:

- **Non-receipt or delay of account statements** - Where clients do not receive their account statements or receive them later than expected.
- **Problems with the execution of transactions** - Issues such as delays in the execution of transactions or transactions not being executed as per the client’s instructions.
- **Issues with account management** - Such as unauthorized account closures, problems with account updates, and incorrect account maintenance.
- **Technological issues** – Client grievances arising from problems associated with trading platform use, including software glitches, system downtimes, and connectivity issues.
- **Poor customer service** - Inadequate service from the brokerage staff, including not responding to queries promptly or satisfactorily.

2. Trade Disputes

Disputes related to the actual trading activities, including:

- **Discrepancies in order execution** - Trades are not executed according to the client's instructions or at incorrect prices.

- **Alleged wrongful trades** - Unauthorized trades made on behalf of the client without their consent or incorrect recording of trade details.
- **Settlement issues** - Delays or errors in the settlement of completed trades.

3. Disputes Related to fees

- **Incorrect charging of fees** - This includes overcharging, incorrect calculation of fees, or charging fees that were not agreed upon.
- **Disputes over penalties** - Penalties misapplied or disagreed with the terms of service.

4. Product Misrepresentation

- **Misleading information about investment products** - Includes providing incorrect or misleading information regarding investment products' risks, benefits, or features.
- **Failure to adhere to agreed terms** - Not providing the services or returns promised at the time of investment.

5. Issues with Depository Participants and Registrars

- **Transfer errors** - Errors made during the transfer of securities between accounts.
- **Registration issues** - Problems related to securities registration in the holder's name.

6. Compliance Violations

- **Non-compliance with regulatory standards** includes failure to adhere to SEBI's regulations or other legal requirements.
- **Breach of contract** - Violations of the contractual agreements between the investors and the market participants.

7. Ethical Violations

- **Insider trading allegations** - Complaints regarding the misuse of undisclosed, material information for trading.
- **Market manipulation** - Actions a market participant takes to deceive or mislead other investors by manipulating the price or availability of securities.

10.4.3 Process for Addressing Grievances

1. **Filing the Complaint:** Investors initiate the process by filing a complaint through the ODR portal, detailing the nature of their grievance against a market participant.

2. **Conciliation:** An attempt is made to resolve the dispute through conciliation, a less formal method where a conciliator helps the parties reach a mutual agreement.
3. **Arbitration:** If conciliation fails or is deemed inappropriate, the matter may be escalated to arbitration, where an arbitrator (or panel of arbitrators) reviews the evidence and issues a binding decision.

This structured approach ensures that all parties clearly understand the process and can prepare adequately for each phase, ultimately leading to the effective resolution of disputes.

Key Features and Improvements Over Previous Systems

- **Centralized Dispute Handling:** Unlike disparate systems previously in place, the ODR Portal provides a unified approach to handle all securities market disputes.
- **Digital First Approach:** Utilizing online tools and technologies facilitates quicker resolutions, reduces the need for physical documentation, and allows participants to engage from remote locations.
- **Structured Resolution Phases:** Clearly defined stages of dispute resolution ensure that both parties know the process and can prepare accordingly.
- **Enhanced Accessibility and User-Friendliness:** The portal is designed to be accessible for all users, irrespective of their tech-savviness.

10.4.4 How the ODR Portal Works: A Step-by-Step Guide

An investor/client shall first take up the grievance with the Market Participant by lodging a complaint directly with the concerned Market Participant.

1. If the grievance is not redressed satisfactorily, the investor/client may, escalate the grievance through the SCORES Portal in accordance with the process laid out therein. The Online Dispute Resolution (ODR) Portal has connectivity with the SEBI SCORES portal / SEBI Intermediary portal.

2. if the investor/client is still not satisfied with the outcome, the grievance can be taken up through the ODR Portal by initiating dispute resolution.

3. A complaint/dispute initiated through the ODR Portal will be referred to an ODR Institution empaneled by a MII. References to ODR Institutions shall be made after a review of such complaint/dispute by the relevant MII with the aim of amicable resolution and which review shall be concluded within 21 calendar days.

4. The ODR Institution that receives the reference of the complaint/dispute shall appoint a sole independent and neutral conciliator from its panel of conciliators, to reach an amicable and consensual resolution within 21 calendar days.

5. If the process of conciliation is successful, the same shall be concluded by a duly executed settlement agreement between the disputing parties. In case the matter is not resolved through the conciliation process within the 21 calendar days an investor/client may pursue online arbitration.

6. Upon the conclusion of the arbitration proceedings and issuance of the arbitral award, payment shall be made by the Market Participant within a period of 15 calendar days from the date of the arbitral award (unless such award requires payment sooner), and/or performance within such period as specified by the arbitral award.

Upon the issuance/pronouncement of the arbitral award, the party against whom order has been passed, will be required to submit its intention to challenge the award under Section 34 of the Arbitration Act within 7 calendar days. Further, in the course of such a challenge, if a stay is not granted within 3 months from the date of the receipt of award, complete adherence to the terms of the arbitral award must be done. The MII shall also monitor the due compliance by the Market Participant with the terms of the arbitral award/judgement of the appellate forum.

General Do's and Don'ts for Investors

Investors must follow some Do's and Don'ts while transacting in the securities market. Given below are some general Do's and Don'ts for investors:

Do's

Investors must:

- Always deal with the market intermediaries registered with SEBI / stock exchanges.
- Carry out due diligence before registering as a client with any intermediary. Carefully read and understand the contents stated in the Risk Disclosure Document, which forms part of the investor registration requirement for dealing through brokers.
- Collect photocopies of all documents executed for registration as a client, immediately on its execution.
- Ensure that the documents or forms for registration as Client are fully filled in.
- Give clear and unambiguous instructions to their broker / agent / depository participant.
- Always insist on contract notes from their brokers. In case of doubt in respect of the transactions, verify the genuineness of the same from the exchange.
- Always settle the dues through the normal banking channels with the market intermediaries.
- Adopt trading / investment strategies commensurate with their risk-bearing capacity as all investments carry some risk, the degree of which varies according to the investment strategy adopted.

- Be cautious about securities which show a sudden spurt in price or trading activity, especially low price stocks.
- Remember that there are no guaranteed returns on investment in the stock market.
- Read the terms and conditions and understand the risk factors associated with the commodity market investment
- Always keep copies of all investment documentation (e.g. application forms, acknowledgements slips, contract notes).
- Send important documents by a reliable mode (preferably through registered post) to ensure delivery.
- Ensure that they have money and will be able to pay, before initiating the purchase.
- Ensure that they hold securities and will be able to deliver, before they sell.
- Follow up diligently and promptly e.g. If the required documentation is not received within a reasonable time, investors must contact the concerned person at the Trading Member immediately.

Don'ts

Investors must not:

- Deal with unregistered brokers or other unregistered intermediaries.
- Execute any documents with any intermediary without fully understanding its terms and conditions.
- Leave the custody of their Demat Transaction slip book in the hands of any intermediary.
- Make any payments in cash.
- Accept unsigned/ duplicate or incomplete contract notes.
- Deal based on rumours or 'tips'.
- Get swayed by promises of high returns.
- Fall prey to promises of guaranteed returns.
- Get misled by guarantees of repayment of their investments through post-dated cheques.
- Get carried away by luring advertisements of any nature in print and electronic media.
- Blindly follow media reports on corporate developments, as some of these could be misleading.
- Blindly imitate investment decisions of others who may have profited from their investment decisions.
- Forgo obtaining all documents of transactions, in good faith, even from people whom they 'know'.
- Delay approaching concerned authorities in case of a dispute. Written complaints must be filed with the Exchange as soon as possible.

Sample questions

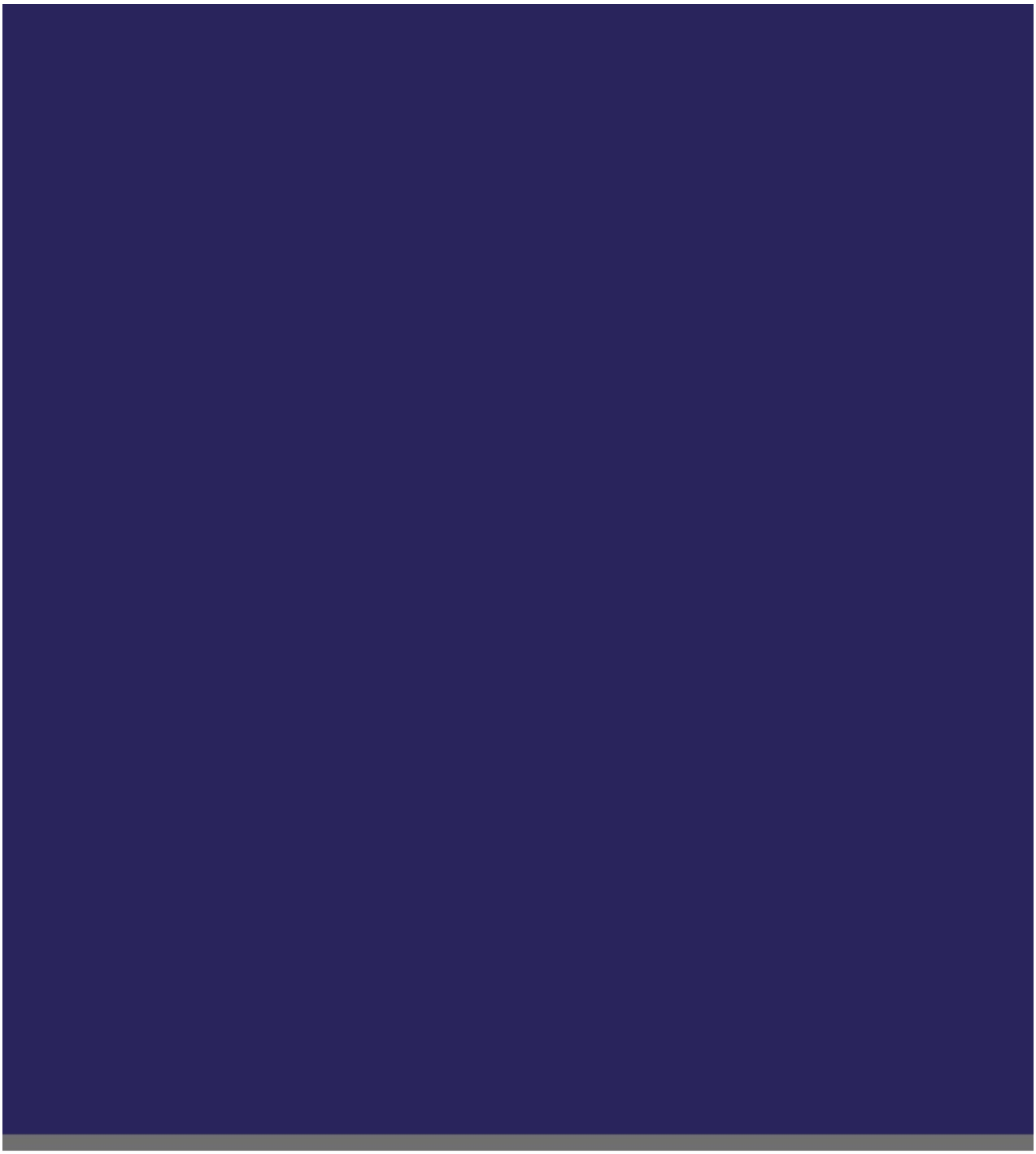
1. When establishing a relationship with a new client, the trading member takes reasonable steps to assess the background, genuineness, beneficial identify, financial soundness of such person and his investment/trading objectives.
(a) **True**
(b) False

2. In the KYC process, Politically Exposed Persons are termed as:
(a) **Clients of Special Categories**
(b) High Networth Clients
(c) Institutional Clients
(d) High Risk Clients

3. _____ is allotted on client onboarding and serves as an exclusive identification of the client.
(a) PAN number
(b) **Unique client code**
(c) ISIN code
(d) Demat account number

4. Under the Anti-Money Laundering (AML) and Combating of Financial Terrorism (CFT) regulations, suspicious transactions must be reported to _____.
(a) Securities and Exchange Board of India
(b) Central Vigilance Commission
(c) Reserve Bank of India
(d) **Financial Intelligence Unit - India**

5. SCORES is: _____.
(a) Exchange's Margin Reporting System
(b) Collateral Reporting System of Clearing Corporation
(c) **SEBI's web-based complaints redressal system**
(d) Customer Due Diligence and e-KYC system



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