WITH THE UPDATED SYLLABUS OF

2025

Supplementary book for

NISM Series VIII

EQUITY DERIVATIVES

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FOREWORD

This guide is designed to help candidates prepare for the NISM Series-VIII: Equity Derivatives Certification Examination. The rapidly growing Indian financial industry, set to expand at 15% annually for the next five years, presents lucrative opportunities. Educational qualifications, especially NISM certifications, are crucial for securing roles in financial services. These certifications serve as prerequisites for various positions, assuring companies of a candidate's knowledge of the stock market. NISM certifications set a common knowledge benchmark, fostering quality market professionals and enhancing investor participation. They also offer structured career paths, allowing individuals to become traders, investors, analysts, advisors, or mutual fund distributors by clearing accredited NISM exams.

Syllabus Outline with Weights

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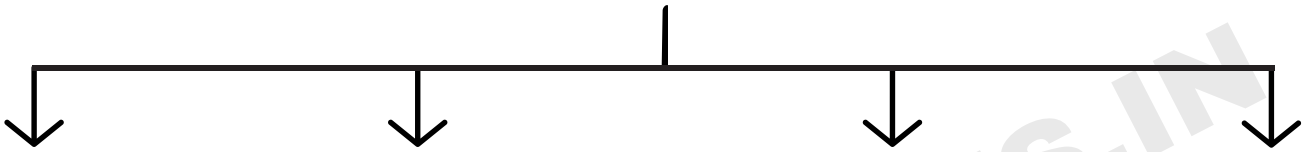
CHAPTER 1
BASIS OF DERIVATIVES

Definition of Derivatives

Derivative is a contract or a product whose value is derived from value of some other asset known as underlying. Derivatives are based on wide range of underlying assets.



Metals	Energy	Agri Commodities	Financial Assets
Gold	Oil	Wheat	Stocks
Silver	Crude	Sugar	Bonds
Aluminum	Natural Gas	Coffee	Forex
Copper	Coal	Cotton	
Zinc	Electricity	Pulses	
Nickel			
Lead			

Derivative Markets: History and Evolution

12th Century: Sellers signed contracts promising future delivery in Europe.

13th Century: Multiple examples of contracts of English Cistercian Monasteries, who frequently sold their wool up to 20 years in advance, to foreign merchants.

Late 17th century: A futures market in rice was developed in Japan at Dojima near Osaka.

1848: The Chicago Board of Trade (CBOT) facilitated the trading of forward contracts.

1865: CBOT listed the first 'exchange traded" derivative contract (Futures contract) in the US.
1919: The Chicago Mercantile Exchange (CME) was reorganized to allow futures trading.
1972: CME introduced the International Monetary Market, which allowed trading in currency futures.
1973: Chicago Board Options Exchange became the first marketplace for trading listed options.
1975-77: CBOT introduced Treasury bill futures and T-Bond futures contract.
1982: CME introduced Eurodollar futures contract and Kansas City Board of Trade launched the first stock index futures.

Factors influencing the growth of derivative market globally

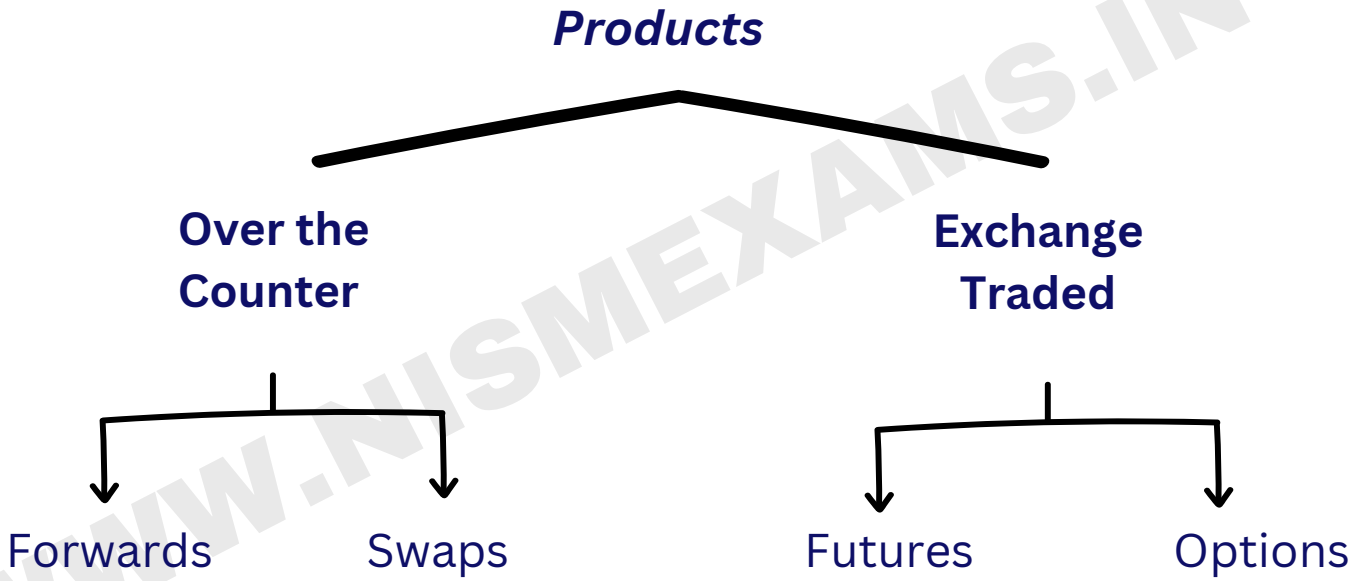
- High volatility in financial markets.
- Integration of financial markets globally.
- The use of the latest technology in communications has helped in the reduction of transaction costs.
- Higher understanding of market participants on sophisticated risk management tools.
- Regular innovations in the derivatives market and newer applications of products.

Indian Derivatives Market

Timeline

1996: SEBI set up a committee under Dr. L. C. Gupta to develop an appropriate regulatory framework for derivatives trading in India.

1998: SEBI set up a group under Prof. J.R.Verma, to recommend measures for risk containment in the derivatives market in India.
1999: The Securities Contract Regulation Act was amended to include "derivatives" within the domain of 'securities' and a regulatory framework was developed for governing its trading.
2000: The exchange-traded derivatives started with SEBI permitting BSE and NSE to introduce the equity derivative segment.



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. The buying and selling of contracts is matched through a negotiated bidding process over a network of telephone or electronic media that links thousands of intermediaries.

Exchange Traded Derivative is a standardized financial contract that is traded on stock exchanges in a regulated manner. They are subject to the rules drafted by the market regulator, the Securities and Exchange Board of India (SEBI).

BASIS FOR COMPARISON	OTC (OVER THE COUNTER)	EXCHANGE
Meaning	Over the Counter or OTC is a decentralized dealer market wherein brokers and dealers transact directly via computer networks and phone.	Exchange is an organized and regulated market, wherein trading of derivative takes place between buyers and sellers in a safe, transparent and systematic manner.
Market maker	Dealer	Exchange itself
Physical Location	No	Yes
Trading hours	24×7	Exchange hours
Transparency	Low	Comparatively high
Contracts	Customized	Standardized
Riskiness	High	Less Risky

Forwards: It is a contract between two parties to buy/sell an underlying asset at a certain future date for a price that is pre-decided on the date of the contract. Both parties are obliged to

honor the transaction irrespective of the price of the underlying asset at the time of delivery.

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. Indeed, we may say futures are exchange-traded forward contracts.

Options: It is a contract that gives the right, but not the obligation, to buy or sell the underlying at a stated date and price. The buyer of the option pays the premium for the right, and the seller of the option receives the premium with the obligation to sell/ buy the underlying 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 help market participants manage risk associated with volatile interest rates, currency exchange rates and commodity prices.

Participants in Derivatives Market

Hedgers

Use derivatives to reduce the risk that they face from potential future movements in the market

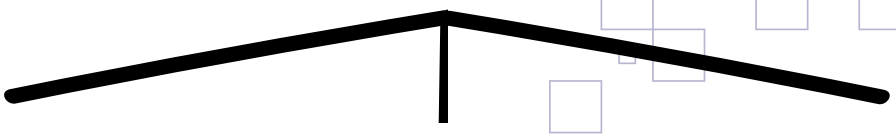
Speculators

Use derivatives to bet on the future direction of the market by anticipation

Arbitrageur

Aims to benefit from the price differences of the same asset in two different markets

Importance of Derivatives



Helps in improving price discovery

Helps transfer of risks

Shifting of trade from unorganized to organized market

Risks faced by participants in Derivatives

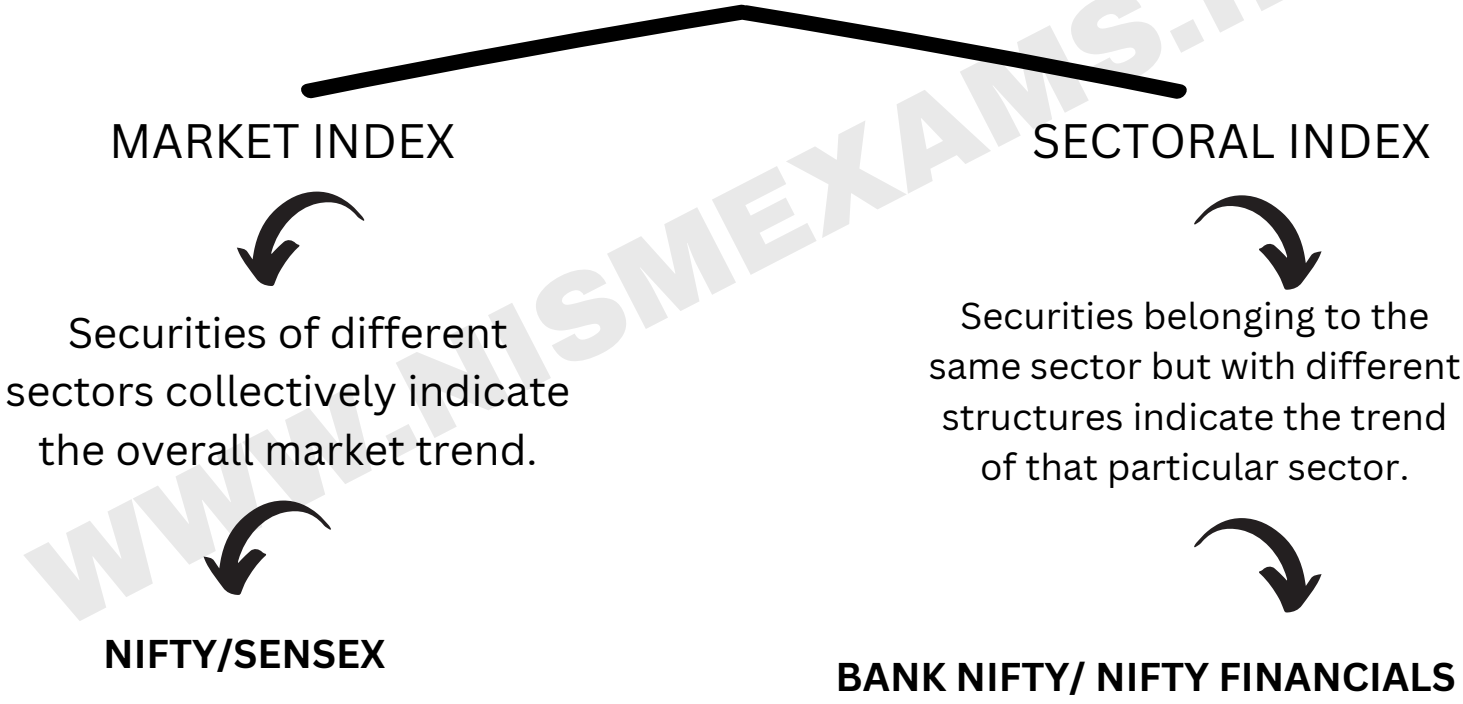
Being a leveraged instrument, derivative instruments always carry risks such as:

- **Counterparty risk:** Default by counterparty
- **Price risk:** Loss of position because of price movement
- **Liquidity risk:** Inability to exit from a position
- **Legal or regulatory risk:** Enforceability of contracts
- **Operational risk:** Fraud, inadequate documentation, improper execution, etc.

CHAPTER 2
UNDERSTANDING INDEX

Index

An Index is a basket of securities of different backgrounds that indicates the price trends of the underlying securities collectively in order to give an indication of overall market trends. It serves as a benchmark for portfolio performance. It is used as an underlying for financial application of derivatives.



Types of Stock Market Indices

Market capitalization weighted index

In this method of calculation, each stock is given weight according to its market capitalization. So, the higher the market capitalization of a constituent, the higher its weight in the index. Popular indices in India Sensex and Nifty were earlier designed on market capitalization weighted method.

Market capitalization (Mcap) = Number of Shares * Market Price

Free-float market capitalization index

Equity holding is divided differently among various stake holders. Market has started to segregate this on the basis of what is readily available for trading or 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.

The free-float method excludes locked-in shares, such as those held by insiders, promoters, and governments

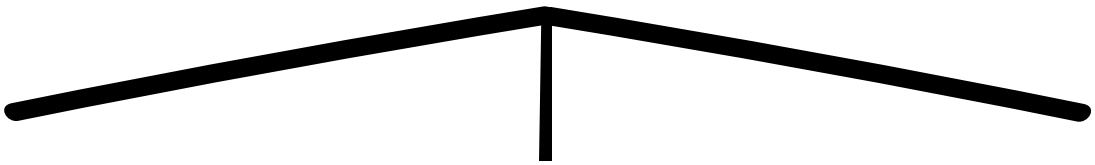
Free-float market capitalization index

It 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.

Equal weighted index

An equally-weighted index makes no distinction between large and small companies, both of which are given equal weighting. The value of the index is generated by adding the prices of each stock in the index and dividing that by the total number of stocks.

Attributes of a good market Index



- Reflection of market behavior
- Computed by independent third party & should be free from influence
- 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.

Index management

Index construction, maintenance and revision process is generally done by specialized agencies. It includes:

Index construction: choosing the index stocks and deciding on the index calculation methodology.

Index maintenance: adjusting the index for corporate actions like bonus issues, rights issues, stock splits, consolidation, mergers, etc.

Index revision: change in the composition of the index as such i.e. replacing some existing stocks with new ones because of a change in the trading paradigm of the stocks/interest of market participants.

Application of Indices

Index Funds: These types of funds invest in a specific index to generate returns equivalent to the return on the index. These funds invest in index stocks in the proportions in which these stocks exist in the index. For instance, the Nifty index fund would get similar returns as that of the Nifty index itself.

Index Derivatives: Index Derivatives are derivative contracts that have the index as the underlying asset. Index Options and Index Futures are the most popular derivative contracts world-

wide. Index derivatives are useful as a tool to hedge against market risk.

Exchange Traded Funds: It is a basket of securities that trade like individual stocks, on an exchange. They have some advantages over other mutual funds as they can be bought and sold on the exchange. Since ETFs are traded on exchanges, intraday transactions are possible. Further, ETFs can be used as basket trading in terms of the smaller denomination and low transaction cost. For example, Nifty BeES was the first ETF in the Indian Securities Market.

CHAPTER 3
INTRODUCTION TO FORWARDS AND FUTURES

Forwards

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. 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.

Limitations of Forwards

- **Liquidity Risk:** 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 create illiquidity in the contracts.

- **Counterparty Risk:** Counterparty risk is the risk of an economic loss from the failure of a counterparty to fulfill its contractual obligation. Thus, a party to the contract may default on his obligation if there is an incentive to default. This risk is also called default risk or credit risk.

Futures

Futures markets were innovated 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

commodity or a financial asset on a future date at an agreed price. Simply futures are standardized forward contracts that are traded on an exchange.

Features of a Futures Market

- The contract between parties to exchange on a centralized trading platform i.e. exchange.
- Price discovery through free interaction of buyers and sellers
- Margins are payable by both parties.
- Quality and quantity decided today (standardized)

Futures Terminologies

Underlying Asset: An original asset on which a derivative instrument is based or gets its value from. Stock is recognized as the underlying asset.

Contract cycle: It is a period over which the futures contract trades. In India the stock exchanges follow 3 monthly contract cycles i.e. current month, the next month, and the month after that. We can make a position in any contract.

Expiry day: The day on which a futures contract ceases to exist. It is the last trading day of that contract, after which settlement takes place. (If the expiry day falls on a trading Holiday, then the expiry will be on the previous trading day.)

Settlement Type: Stock Futures- Physical settlement of underlying shares

Index Futures- Cash settlement only

Commodity Futures- Physical settlement of commodity

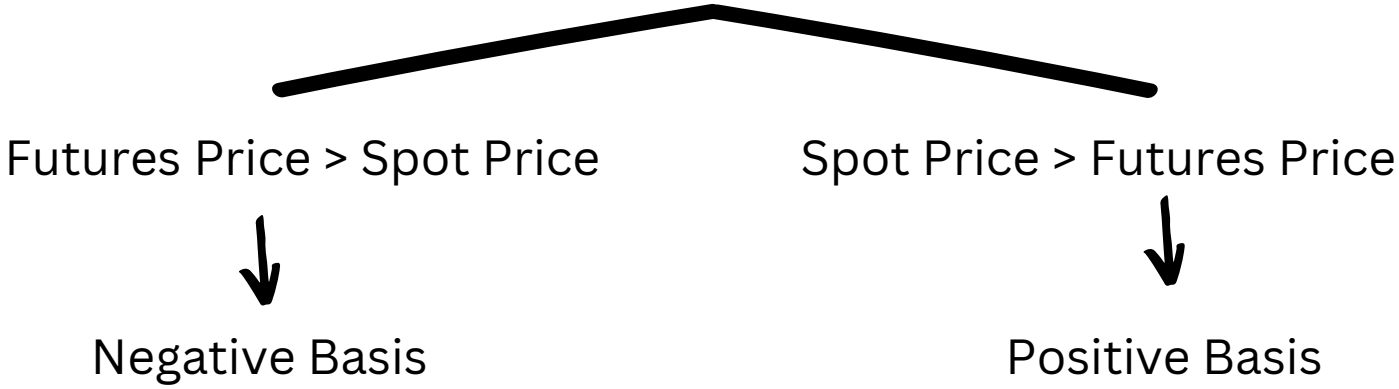
Lot size: Lot size is the contract size specifying the number of units of underlying assets in a contract. It is the minimum quantity of underlying assets that need to be traded in a futures contract.

Contract Value: Futures contracts are traded in lots and to arrive at the contract value we have to multiply the price with lot size.

Spot Price: The price at which an underlying asset trades in the cash market. It is the original price quoted on exchanges. For example- the per-share value of Reliance on May 16, 2023, is quoted at 2470.

Tick size: It is the minimum move allowed in the price quotations. Exchanges decide the tick sizes on traded contracts as part of contract specifications. The tick size for futures traded on the NSE is 0.05.

Basis: The difference between the spot price and the futures price is called basis.



Cost of carry: Cost of carry is the relationship between futures prices and spot prices. It measures the storage cost plus the interest that is paid to '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) the dividend earned.

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 customers.

Initial Margin: The amount one needs to deposit in the margin account at the time of entering a futures contract is known as the initial margin.

Marking to market: In the futures market, while contracts have a maturity of several months, profits and losses are settled on a day-to-day basis – called mark to market (MTM) settlement.

Open Interest and volumes traded: An open interest is the total number of contracts outstanding (yet to be settled) for an underlying asset.

Price Band: It is the maximum price range within which a contract is permitted to trade during a day.

Different Positions in Derivatives Market

Long Position: Initiating a buying position in a contract is called a "Long Position".

Short Position: Initiating a selling position in a contract is called a "Short Position".

Open Position: Outstanding either long (buy) or short (sell) positions in various derivative contracts is called “Open Position”.

Naked and calendar spread position: Naked position in the futures market simply means a long or short position in any futures contract without having any position in the underlying asset. A 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.

Opening a position: Opening a position means initiating a trade by either buying or selling a contract, which increases the client’s open position.

Closing a position: Closing a position means squaring off by either buying or selling a contract, which essentially results in reduction of client’s open position (long or short).

Pay-off charts

Pay off 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 graphical representation showing the price of the underlying asset on the X-axis and profits/ losses on the Y-axis. In case of futures contracts, long as well as short position has unlimited profit or loss potential. This results into linear pay offs for futures contracts.

Futures Pricing

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 the pricing of futures contracts. Market participants use different models for pricing futures.

1. Cash and Carry Model for Futures Pricing

Cash and Carry model is also known as non-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. The cost of creating a synthetic futures position is the fair price of futures contract. Fair price of futures contract is nothing but addition 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. Whereas for commodities, it would also include costs like warehousing cost, insurance cost, etc.

Assumptions in cash and carry model

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

- No margin requirements

Convenience yield

The convenience yield is defined as the benefit of holding the physical product, rather than a contract or derivative product. Sometimes, holding the physical underlying good rather than a contract is more beneficial. For instance, in case of a natural disaster like a flood in a particular region, people start storing essential commodities like grains, vegetables 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 similarly 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 are deriving convenience, just by holding the asset. This is termed as convenience return or convenience yield.

2. Expectancy model of futures pricing

According to the expectancy model, 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. According to this model:

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

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

It is important to understand what actually futures prices indicate. For instance, if say December 2023 index futures contract is trading today (in November 2023) at 20100, what does it mean? We can explain this by saying that the market expects the cash index to settle at 20100 at the closure of the market on the last Thursday of December (i.e., on the last trading day of the contract which is December 28, 2023).

Accordingly, both futures and spot prices converge at the maturity of the futures contract, as then 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 principal remains the same for all the underlying assets.

Uses of Index futures

Equity derivatives are widely used to manage or hedge against the risks that are inherent to investment in securities. Price risk is nothing but a change in the price movement of an asset, held by a market participant, in an unfavorable direction. This risk is broadly divided into two components.

- Specific Risk or Unsystematic Risk is the component of price risk that is unique to particular events of the company and/or industry. This risk is inseparable from investing in the securities.
- Systematic Risk An investor can diversify his portfolio and

eliminate a major part of price risk i.e. the diversifiable/unsystematic risk but what is left is the non-diversifiable portion or the market risk called systematic risk.

Important Terms In Hedging

Long hedge: A long hedge is a transaction when we hedge our position in the cash market by going long in the futures market.

Short hedge: A short Hedge is a transaction when the hedge is accomplished by going short in the futures market.

Cross hedge: When one uses index futures to hedge against the market risk, he is essentially establishing a cross hedge because he is not using the exact underlying to hedge the risk against.

Arbitrage opportunities in futures market

Cash and carry arbitrage: Cash and carry arbitrage refers to a long position in the cash or underlying market and a short position in the 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.

CHAPTER 4
INTRODUCTION TO OPTION

Options Contracts

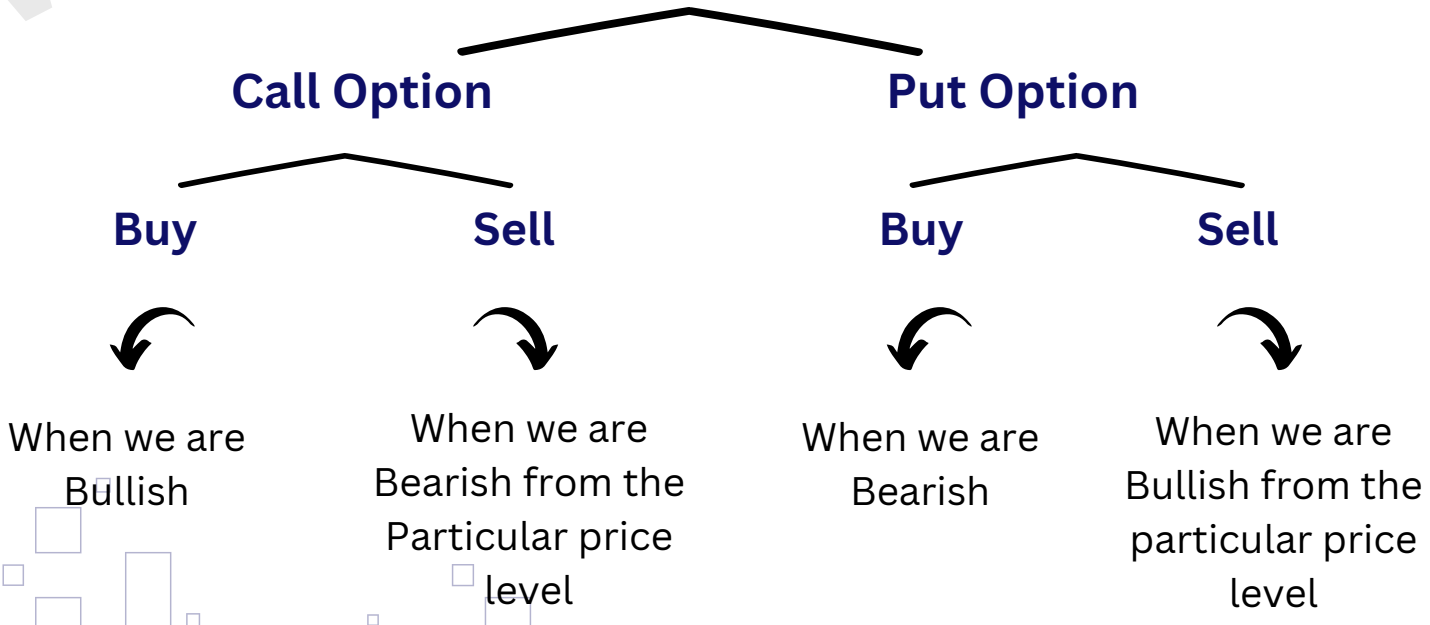
An Option is a contract that gives the right, but not an obligation, to buy or sell the underlying asset on or before a stated date/day, at a stated price, for a price. The party taking a long position i.e. buying the option is called buyer/ holder of the option and the party taking a short position i.e. selling the option is called the seller/ writer of the option

- **Call Option**

A Call option is a contract that gives the holder a right but not an obligation to buy underlying asset on a specified date at a pre-determined price.

- **Put Option**

A Put option is a contract that gives the holder a right but not an obligation to sell underlying asset on a specified date at a pre-determined price.



Options Terminology

Strike Price: Strike price is the price per share of underlying security which may be purchased or sold by the option holder. The different strike prices quoted above are all price levels of underlying on which options contract can be undertaken.

In the money (ITM) Option: This option would give the holder a positive cash flow if it were exercised immediately. These are the price levels that the market has already breached. A call option is said to be ITM when the spot price is higher than the strike price. And, a put option is said to be ITM when the spot price is lower than the strike price. In our chart, the shaded strikes are ITM option strikes.

At the money (ATM) option: The money option would lead to zero cash flow if it were exercised immediately. Therefore, for both call and put ATM options, the strike price is equal to the spot price.

Out of the money (OTM) option: Out of the money option is one which is yet to be breached by the underlying asset. 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 the spot price is lower than the strike price. A put option is said to be OTM when the spot price is higher than the strike price. In our chart, the non-shaded strikes are OTM option strikes.

Spot Price: It is the price at which the underlying asset trades in the spot or cash market. For example, Nifty50 is quoting 17000

on price charts.

Lot size: Lot size is the number of units of underlying assets in a contract. It is the minimum quantity of underlying assets That need to be traded in an option contract.

Settlement Type:

- Stock Options
- Physical settlement of underlying shares
- Index Options
- Cash settlement only.

Premium or Option Price: Premium is the option contract value which the option buyer pays to the option seller. premium value quoted above is for single unit of Nifty and to arrive at the total premium in a contract, we need to multiply this premium with the lot size.

Intrinsic Value

Intrinsic value refers to the amount by which an option is in the money i.e. the amount an option buyer will realize, if he exercises the option instantly. Only ITM strikes have the intrinsic value.

ITM CALLS

↓

Strike Price

↓

Spot Price

ITM PUTS

↓

Spot Price

↓

Strike Price

Extrinsic Value

It is the difference between option premium value and intrinsic value of an option, if any. ATM and OTM strikes will have only time value because their intrinsic value is zero.

Exercise of an Option Contract: An option contract gives the buyer a privilege to exercise his right to buy (in case of a call option) or sell (in case of put option) the underlying asset on or before expiry. Here, buyer will ask seller to transact in underlying assets as defined by the option contract.

American Option	European Option
The buyer of such option can exercise his right at any time on or before the the expiry day of the contract.	The buyer of such option can exercise his right only on the expiry day of the Contract. India follows European style of option contract.

Expiry Day: The day on which an option contract ceases to exist. It is the last trading day of the contract, after which, settlement in options takes place.

- INDEX OPTIONS
  - Nifty Financial Services → Every Tuesday (Weekly Expiry)
  - Bank Nifty Nifty50 → Every Thursday (Weekly Expiry)
- STOCK OPTIONS
  - Stocks in FnO Category → Last Thursday of the Month (Monthly Expiry)

(If the expiry day of the Options falls on a trading Holiday, then the expiry will be on the previous trading day.)

Open Interest: Open interest is the total number of option

contracts outstanding against each strike price for an underlying asset.

OPTION BUYER	OPTION SELLER
He is also called as option holder	He is also called as option writer
He always has a right to exercise	He is always under obligation to fulfil.
Option buying has potential to generate unlimited profits	Option selling comes with limited profit potential
Option buying is exposed to limited losses	Option selling is exposed to unlimited losses
He has to pay the premium amount	He receives the premium amount.
For option buyer premium is an expense	For option seller premium is the only income.
An option buyer pays a relatively small premium for market exposure.	Whereas option writer has to pay huge amount for market exposure.

Fundamental parameters on which the option price depends

- Spot price of the underlying asset
- Strike price of the option
- Volatility of the underlying asset's price
- Time to expiration
- Interest rate

Option Greeks

Delta: It 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 concerning the price of the underlying asset.

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

Gamma: It measures the change in delta concerning the change in the price of the underlying asset. This is called a second derivative option about the price of the underlying asset. It is calculated as the ratio of change in delta for a unit change in the market price of the underlying asset.

Gamma = Change in an options delta / Unit change in the price of the underlying asset.

Theta: It is a 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

Vega: This is a 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 is positive for a long call and a long put.

Vega = Change in an option premium / Change in volatility

Rho: It 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

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