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B.Com Honours | Semester VI | Calicut University

Stock Market Investment and Trading

Course Code: COM6FS113 (1) • Module 4 Notes

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Module IV: Financial Derivatives

Financial derivatives represent sophisticated financial contracts whose value is derived from the performance of an underlying asset, index, or reference rate. In modern financial architecture, derivatives serve two foundational functions: providing institutional market participants with vital instruments to transfer, unbundle, and hedge price risks; and offering active market participants leveraged conduits for directional positioning and volatility trading. The Indian derivatives market, centered on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE), is one of the most liquid and active derivative ecosystems globally. This module explores the structural mechanics of futures and options contracts, contract specifications, margin and mark-to-market systems, physical vs. cash settlement, Option Greeks, systematic trading strategies, transaction charges, and the statutory tax framework governing derivative operations.

1. Derivatives Architecture: Foundations & Typologies

A derivative is a financial contract between two or more counterparties whose market quotation is derived from the value of an underlying entity. The underlying asset may be an equity share, an equity market index, a sovereign debt instrument, a foreign currency, or a physical commodity.

Evolutionary Spectrum of Financial Commitments Contract Hierarchy
1. Forward Contracts (Bilateral OTC): Customized, privately negotiated over-the-counter agreements between two parties to buy or sell an asset at a specified future date and price. Subject to substantial counterparty default risk, lack of liquidity, and absence of standardized terms.

↓ Standardized Exchange Modernization

2. Futures Contracts (Exchange-Traded): Standardized agreements traded on recognized stock exchanges, cleared and guaranteed through central clearing corporations. Standardized lot sizes, uniform expiry dates, daily mark-to-market margining, and novation eliminate counterparty default hazard.

↓ Asymmetrical Rights vs Obligations

3. Options Contracts (Exchange-Traded): Conditional derivative instruments granting the buyer the legal right, without imposing any binding obligation, to execute a buy or sell transaction at a specified price within a designated timeframe.

1.1 Underlying Assets in Indian Equity Derivatives

- **Benchmark Equity Indices:** Contracts based on broad market indices, predominantly the NIFTY 50 and BANK NIFTY on the NSE, and the SENSEX and BANKEX on the BSE. Index derivatives enable institutional managers to hedge macroeconomic systemic risk across diversified portfolios.
- **Individual Single Stocks:** Contracts based on specific high-liquidity large-cap and mid-cap equity shares. To be eligible for derivative trading, a stock must satisfy rigorous SEBI surveillance

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criteria, including average daily market capitalization, median quarter-sigma order size, and high cash-market trading turnover.

1.2 Pre-requisites for Trading in the Derivative Segment

Due to the high financial leverage inherent in futures and options, regulatory guidelines enforce strict suitability and onboarding filters:

- **Income Documentation Mandate:** Under SEBI Master Circulars, a client cannot trade in the Futures & Options (F&O) segment without submitting verified financial proof of income. Acceptable proofs include: latest 6 months' bank statement with healthy average balance, latest Income Tax Return (ITR-V) acknowledgment, salary slip (Form 16), or net worth certificate from a Chartered Accountant.
- **Risk Disclosure Document (RDD):** The client must formally acknowledge and sign the SEBI-mandated Risk Disclosure Document detailing empirical data showing that the vast majority of individual retail traders incur net losses in the derivative segment.
- **Margin Capital Adequacy:** Trading accounts must maintain liquid funds or approved pledged collateral to meet upfront and dynamic margin requirements.

1.3 Options Architecture: Calls, Puts, and Styles

- **Call Option (CE - European Call):** A contract conferring upon the holder (buyer) the right, but not the obligation, to purchase the underlying asset at a predetermined price (Strike Price) on or before expiry. The buyer expects the underlying price to rise significantly.
- **Put Option (PE - European Put):** A contract conferring upon the holder (buyer) the right, but not the obligation, to sell the underlying asset at the strike price on or before expiry. The buyer expects the underlying price to decline significantly.
- **American vs. European Exercise Styles:**
  - *American Style Options:* Can be exercised by the holder at any point in time up to and including the expiration date.
  - *European Style Options:* Can be exercised exclusively on the formal expiration date itself. **All equity index and single-stock option contracts in India are statutorily standardized as European Style Options** (symbolized as CE and PE).

1.4 Moneyness of Options: ITM, ATM, and OTM

Moneyness describes the intrinsic relationship between the option's strike price and the current market price of the underlying asset:

Moneyness State	Call Option (CE) Condition	Put Option (PE) Condition
In-the-Money (ITM)	Spot Price > Strike Price. Possesses positive intrinsic value.	Spot Price < Strike Price. Possesses positive intrinsic value.
At-the-Money (ATM)	Spot Price = Strike Price (or closest available strike). Intrinsic value is zero.	Spot Price = Strike Price (or closest available strike). Intrinsic value is zero.

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Moneyness State	Call Option (CE) Condition	Put Option (PE) Condition
Out-of-the-Money (OTM)	Spot Price < Strike Price. Zero intrinsic value; composed entirely of time value.	Spot Price > Strike Price. Zero intrinsic value; composed entirely of time value.

Option Premium Decomposition:
Total Option Premium = Intrinsic Value + Time Value (Extrinsic Value)

• *Intrinsic Value (Call):* Maximum of [0, Spot Price - Strike Price]
• *Intrinsic Value (Put):* Maximum of [0, Strike Price - Spot Price]
• *Time Value:* Premium - Intrinsic Value (Reflects the probability of the option expiring ITM before expiration; decays toward zero as expiry approaches).

1.5 Structural Comparison: Cash Equity vs. Futures vs. Options

Dimension	Cash Market Equity	Futures Contracts	Options Contracts
Capital Requirement	100% purchase price paid upfront in cash delivery.	Fractional upfront margin (SPAN + Exposure: ~15% - 25%).	Buyers pay 100% premium; sellers require full margin.
Holding Duration	Indefinite; can be held for decades in demat account.	Strict finite maturity (max 1 to 3 months to contract expiry).	Strict finite maturity (weekly or monthly contract expiry).
Risk Exposure	Limited to total capital invested; cannot become negative.	Theoretically unlimited on both long and short positions.	Buyer risk capped at premium; seller risk theoretically unlimited.
Corporate Benefits	Entitled to dividends, bonus shares, rights, and AGM voting.	Zero dividend entitlement; no voting rights or corporate franchise.	Zero dividend entitlement; no voting rights or corporate franchise.
Short Selling	Restricted to intraday sessions only (must square off by 3:30 PM).	Permitted freely across multi-day/multi-week holding tenors.	Permitted freely via Put buying or Call writing.
Income Tax Status	Capital Gains (STCG u/s 111A, LTCG u/s 112A).	Non-Speculative Business Income u/s 43(5)(e).	Non-Speculative Business Income u/s 43(5)(e).

2. Contract Specifications on Indian Stock Exchanges

Derivatives trading requires standardization across all transactional parameters to ensure continuous liquidity and automated clearing.

2.1 Standardization Framework

- **Market Lot Size:** Derivatives cannot be traded in single individual share units. Instead, contracts are traded in standardized bundles called *Lots*. For example, NIFTY 50 index contracts trade in

standardized lot multiples (e.g., 25 or 50 index units per lot). For individual stocks, SEBI calibrates lot sizes dynamically so that the nominal value of a single lot contract falls within a statutory band of ₹5 Lakhs to ₹15 Lakhs.

- **Contract Expiration Cycles:** Indian stock exchanges offer multiple concurrent expiration tenors:
  - *Monthly Contracts:* Expire on the last Thursday of the respective calendar month (near-month, next-month, and far-month). If Thursday is a trading holiday, expiry precedes on Wednesday.
  - *Weekly Options:* Expire weekly on designated weekdays (e.g., NSE Nifty weekly contracts expiring on Thursdays; BSE Sensex weekly contracts expiring on Fridays). SEBI rationalization measures restrict each exchange to one benchmark weekly index derivative contract to mitigate speculative retail overtrading.
- **Strike Price Intervals:** The predetermined fixed intervals between successive strike prices set by the exchange (e.g., 50-point intervals for NIFTY 50; 100-point intervals for BANK NIFTY; ₹10, ₹20, or ₹50 intervals for individual equities based on price slabs).

2.2 Benchmark Contract Specifications on Indian Exchanges

Specification	NIFTY 50 Index Derivative (NSE)	S&P BSE SENSEX Derivative (BSE)
Underlying Symbol	NIFTY (50 multi-sector blue-chip companies)	SENSEX (30 prominent mega-cap corporations)
Tick Size	0.05 Index points (₹1.25 per tick per lot at 25 lot size)	0.05 Index points (₹0.50 per tick per lot at 10 lot size)
Contract Tenors	3 Near Months + Weekly Expiries	3 Near Months + Weekly Expiries
Settlement Mechanism	Cash Settlement based on closing price on expiry date	Cash Settlement based on closing price on expiry date
Trading Hours	9:15 AM to 3:30 PM (Monday to Friday)	9:15 AM to 3:30 PM (Monday to Friday)

3. Clearing, Margining, and Settlement Mechanics

Post-trade operational integrity in derivatives is managed by accredited clearing corporations (NSE Clearing Limited - NCL and Indian Clearing Corporation Limited - ICCL).

3.1 The Margin Architecture: SPAN and Exposure Margins

Unlike equity cash delivery, where 100% purchase consideration must be deposited, futures contracts and short option positions are executed on a fraction of total contract value known as **Margin**.

The Tripartite Margin Safeguard Framework Risk Management
1. SPAN Margin (Standard Portfolio Analysis of Risk): Developed by the Chicago Mercantile Exchange (CME) and universally adopted by SEBI. SPAN calculates the maximum potential portfolio loss over a one-day holding horizon under 16 varied market simulation scenarios (testing price spikes, price crashes, and extreme volatility shifts). SPAN margin must be collected upfront prior to order execution.

2. Exposure Margin: A supplementary margin levied by the clearing corporation over and above the SPAN margin to absorb tail risk and extreme black-swan market shocks beyond statistical normal distributions (typically 3% of notional value for index futures and 5% to 10% for stock futures).

3. Peak Margin Regulations: Clearing corporations take multiple random snapshots of client margin utilization throughout the active trading day. Brokers are penalised if clients execute intraday positions without holding 100% of the requisite upfront margin in cash or approved collateral at every snapshot.

3.2 Mark-to-Market (MTM) Settlement

Futures positions are subject to mandatory daily Mark-to-Market accounting at the end of each trading session. The daily closing settlement price is compared against the previous day's closing price (or trade execution price). Unrealized gains are credited in cash to the trader's account overnight, while unrealized losses are debited.

Worked Numerical Case: Daily Mark-to-Market (MTM) Accounting 5-Day Futures Sequence
Scenario: A trader buys 1 Lot of NIFTY Futures (Lot Size = 50 units) on Day 1 at an entry price of 24,000. Upfront margin deposited is ₹1,40,000. The table below traces daily MTM cash credits and debits over a 5-day holding sequence:

Day	Settlement Price	Price Change	Daily MTM Cash Flow	Cumulative Account Balance
Day 1 (Entry)	24,120	+120 pts	Credit: +₹6,000 (50 * +120)	₹1,46,000
Day 2	24,050	-70 pts	Debit: -₹3,500 (50 * -70)	₹1,42,500
Day 3	23,850	-200 pts	Debit: -₹10,000 (50 * -200)	₹1,32,500
Day 4	24,200	+350 pts	Credit: +₹17,500 (50 * +350)	₹1,50,000
Day 5 (Square-off)	24,300	+100 pts	Credit: +₹5,000 (50 * +100)	₹1,55,000

Net Realized Profit over 5 Days: (24,300 - 24,000) * 50 units = +₹15,000.00. Notice that this exactly equals the cumulative sum of all daily MTM cash credits and debits (+6,000 - 3,500 - 10,000 + 17,500 + 5,000 = +₹15,000).

3.3 Settlement at Expiry: Physical Delivery vs. Cash Settlement

- **Cash Settlement (Index Contracts):** All equity index futures and options (NIFTY, BANK NIFTY, SENSEX) are settled purely in cash. On the final expiry day, no physical securities are exchanged; the difference between the final settlement price and the transaction/strike price is settled via monetary credits or debits.
- **Mandatory Physical Settlement (Single-Stock Derivatives):** In 2018, SEBI made physical delivery settlement mandatory for all single-stock futures and in-the-money stock options:
  - *Long Stock Futures / ITM Call Holder:* Must take physical delivery of the full underlying shares in demat form, requiring 100% cash funding.
  - *Short Stock Futures / ITM Put Holder:* Must deliver the actual physical shares from demat storage to receive cash proceeds.
  - *Failure to Deliver:* Triggers exchange auction penalties, where shares are bought in the open auction market at substantial penalty premiums.

3.4 Open Interest (OI) Analysis

Open Interest represents the aggregate number of active, outstanding derivative contracts that have not been settled, exercised, or offset through opposite closing transactions. Analyzing changes in price alongside changes in Open Interest reveals underlying institutional accumulation or distribution:

Price Movement	Open Interest (OI)	Market Interpretation	Technical Implication
Rising	**Rising**	**Long Build-up**	Aggressive fresh buying by institutional market participants; strong bullish momentum.
Falling	**Rising**	**Short Build-up**	Aggressive fresh selling and short creation; strong bearish continuation signal.
Rising	**Falling**	**Short Covering**	Short sellers panicking and buying back open positions to stop losses; temporary bullish bounce.
Falling	**Falling**	**Long Unwinding**	Long buyers liquidating positions and taking profits/losses; weakening market trend.

4. The Option Greeks

Option Greeks are mathematical risk sensitivities calculated from option pricing algorithms (such as the Black-Scholes-Merton model) that quantify how an option premium changes in response to shifts in underlying asset price, time decay, market volatility, and interest rates.

1. Delta (Δ)

Measures the expected change in option premium for every ₹1.00 move in the underlying asset.
• Call Delta ranges from 0.00 to +1.00 (ATM Call Δ ≈ +0.50).
• Put Delta ranges from 0.00 to -1.00 (ATM Put Δ ≈ -0.50).
• Reflects the approximate probability of the option expiring in-the-money.

2. Gamma (Γ)

Measures the rate of change in Delta for every ₹1.00 move in the underlying asset.
• High Gamma means Delta changes rapidly, creating sharp explosive price moves.
• Highest for At-the-Money options near contract expiration (creates "expiry day gamma explosions").

3. Theta (Θ - Time Decay)

Measures the absolute erosion in option premium caused by the passage of one single day, holding price constant.
• Always negative for option buyers (wasting asset).

• Always positive for option sellers (writers benefit from time decay).
• Decays exponentially during the final 7 to 10 days before contract expiry.

4. Vega (ν - Volatility Sensitivity)

Measures the change in option premium for every 1% change in Implied Volatility (IV).
• Option buyers are Long Vega (profit from rising volatility).
• Option sellers are Short Vega (profit from volatility collapse, known as "IV crush").
• Gauged systemically via the India VIX volatility index.

5. Systematic Trading Strategies in Futures and Options

Traders utilize options not merely for simple speculation, but to construct multi-leg synthetic spreads that define maximum risk, control capital drawdown, and generate consistent risk-adjusted returns.

5.1 Vertical Spreads: Bull Call Spread and Bear Put Spread

Bull Call Spread (Moderately Bullish)

Construction: Buy 1 Lower Strike Call (ATM/ITM) + Sell 1 Higher Strike Call (OTM).
Economics: Premium received from selling the OTM call offsets the cost of buying the ATM call, reducing the net debit and breakeven point.
Risk-Reward: Max Loss = Net Premium Paid; Max Profit = Spread Width - Net Premium Paid. Both risk and profit are strictly capped.

Bear Put Spread (Moderately Bearish)

Construction: Buy 1 Higher Strike Put (ATM/ITM) + Sell 1 Lower Strike Put (OTM).
Economics: Premium received from selling the OTM put offsets the cost of buying the ATM put.
Risk-Reward: Max Loss = Net Premium Paid; Max Profit = Spread Width - Net Premium Paid. Capped downside protection against market drops.

5.2 Non-Directional Strategies: Iron Condor and Iron Butterfly

Iron Condor (Range-Bound Market)

Construction: 4-leg defined risk strategy combining an OTM Bear Call Spread and an OTM Bull Put Spread:
• Buy OTM Call (Upper wing protection)
• Sell OTM Call (Upper credit)
• Sell OTM Put (Lower credit)
• Buy OTM Put (Lower wing protection)
Profit Zone: Collects net upfront credit; achieves maximum profit if the underlying price remains comfortably between the two short strikes at expiration.

Iron Butterfly (Tight Pinning Target)

Construction: Combines a Short Straddle at ATM with Long OTM Call and Put wings for catastrophic protection:
• Sell 1 ATM Call + Sell 1 ATM Put

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• Buy 1 OTM Call + Buy 1 OTM Put
Profit Zone: Produces high risk-to-reward credit; achieves peak profit when the underlying stock settles exactly at the central ATM strike at expiry.

5.3 Volatility Strategies: Straddles and Strangles

Long Straddle (Volatility Expansion)

Construction: Buy 1 ATM Call + Buy 1 ATM Put with identical strike and expiry.
Application: Executed prior to major binary catalyst events (e.g., General Election results, Union Budget, major corporate earnings announcements).
Outcome: Generates massive unlimited profits if the market explodes in either direction. Max Loss is strictly limited to total premium paid.

Short Straddle (Volatility Contraction / Theta)

Construction: Sell 1 ATM Call + Sell 1 ATM Put.
Application: Deployed when the market is projected to trade within a narrow, quiet range with collapsing volatility.
Outcome: Captures maximum dual theta decay. Max Profit = Total Premium Collected. Carries theoretically unlimited downside risk if the market experiences a sharp breakout.

5.4 Hedging and Cash Yield Strategies

- **Covered Call Strategy:** An investor holding 500 physical shares of a company sells an Out-of-the-Money Call option against those shares. If the share price stays below the strike price, the call expires worthless, allowing the investor to pocket the entire premium as a recurring cash dividend yield. If the stock rallies beyond the strike, the shares are sold at the strike price, capping upside.
- **Protective Put Strategy (Portfolio Insurance):** An investor holding an equity portfolio purchases an At-the-Money or Out-of-the-Money Put option. If a severe market crash occurs, gains on the put option offset the portfolio's unrealized capital losses rupee-for-rupee, establishing a firm floor beneath portfolio net worth.

6. Transaction Costs and Statutory Taxation of Derivative Trading

Derivative trading is subject to rigorous tax reporting and compliance obligations under the Income Tax Act, 1961.

6.1 Statutory Transaction Costs

- **Brokerage:** Typically capped at a flat fee of ₹20 per executed order by discount brokers, or ₹50 to ₹100 per lot by traditional full-service institutions.
- **Securities Transaction Tax (STT):** Levied on futures and options trades. Under the Finance Act 2024, STT on futures sale was revised to **0.02%** (from 0.0125%), and STT on the sale of options premium was revised to **0.1%** (from 0.0625%).
- **Exchange Turnover Fees:** Capped at ~0.0019% for futures and ~0.05% on premium turnover for options by the NSE.

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- **Stamp Duty:** Levied under the Indian Stamp Act at 0.002% on futures purchase and 0.003% on option premium purchase.
- **GST:** Standard statutory rate of 18% applied strictly to [Brokerage + Exchange Fees + SEBI Turnover Fee].

6.2 Income Tax Classification: Non-Speculative Business Income

Under Section 43(5)(e) of the Income Tax Act, 1961, transactions in eligible financial derivatives executed on recognized stock exchanges are statutorily classified as **Non-Speculative Business Income** (rather than speculative income or capital gains).

- **Taxability at Normal Slab Rates:** Net profits from F&O trading are aggregated with other commercial business revenues and taxed at applicable progressive personal income tax slabs or corporate tax rates.
- **Deductibility of Legitimate Business Expenses:** Because F&O is assessed as active business income, traders are legally entitled to deduct all legitimate operational expenses incurred wholly and exclusively for trading:
  - Brokerage, exchange transaction charges, and STT paid.
  - Depreciation on computer hardware, monitors, laptops, and mobile devices used for trading.
  - Internet broadband charges, mobile telephone expenses, trading software subscriptions, and advisory fees.
  - Commercial office rent, electricity charges, and books/periodicals on technical analysis.

6.3 Tax Audit Framework under Section 44AB & Turnover Computation

Determining whether a derivative trader is legally mandated to undergo a statutory Tax Audit conducted by an independent practicing Chartered Accountant depends on the accurate computation of **Trading Turnover**.

The Absolute Profit Method for F&O Turnover Computation ICAI Guidance Note
Guidance Note Issued by the Institute of Chartered Accountants of India (ICAI):
In derivative transactions, the contract value does not represent turnover because settlement occurs only on price differentials. Turnover is computed by taking the **sum of absolute values of all positive and negative settlements**:

F&O Turnover Formula:
Turnover = Σ |Absolute Profit on each trade| + Σ |Absolute Loss on each trade| + Total Premium Received on Sale of Options

Worked Case Example:
• Trade 1 (Nifty Futures): Profit = ₹40,000 → Absolute value = ₹40,000
• Trade 2 (Bank Nifty Options): Loss = -₹65,000 → Absolute value = ₹65,000
• Trade 3 (Reliance Options Sale): Premium received = ₹15,000 → Absolute value = ₹15,000
• *Net Realized Trading Profit/Loss = ₹40,000 - ₹65,000 = -₹25,000 (Net Loss)*
• *Taxable F&O Turnover = ₹40,000 + ₹65,000 + ₹15,000 = ₹1,20,000.*

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6.4 Audit Thresholds & Loss Carry-Forward Rules

- **Section 44AB Statutory Audit Limit:** Under Section 44AB, tax audit is mandatory if business turnover exceeds ₹1 Crore. However, under the digital transaction proviso, if 95% or more of all business transactions (both payments and receipts) are executed through banking channels / digital clearing (which is 100% true for exchange-traded F&O), the tax audit threshold is expanded to **₹10 Crores**.
- **Section 44AD Presumptive Taxation:** Eligible resident individuals and HUFs with turnover up to ₹2 Crores can declare profits at 6% of digital turnover under presumptive taxation without maintaining books of account.
- **Set-off and Carry-Forward of Losses (Section 71 & 72):** F&O business losses can be set off against any other head of income in the same financial year (e.g., house property, capital gains, other business income), *except salary income*. Unabsorbed losses can be carried forward for up to **8 assessment years** to be set off against future business profits, provided the return of income is filed on or before the statutory due date u/s 139(1).

Summary Synthesis

Domain	Key Structural Features	Practical Takeaway
Derivative Instruments	Futures vs Options (CE & PE), European Style Standardization.	Futures involve symmetric obligations; options provide asymmetric rights with defined risk for buyers.
Moneyness & Premium	ITM, ATM, OTM, Intrinsic Value + Time Value Decay.	OTM options consist purely of wasting time value, deteriorating rapidly toward expiration.
Margins & Settlement	SPAN Margin, Exposure Margin, Daily MTM, Physical Delivery for Stocks.	SPAN margins prevent systemic default; single-stock derivatives require 100% demat share delivery at expiry.
The Option Greeks	Delta (Δ), Gamma (Γ), Theta (Θ), Vega (ν).	Sensitivities dictate hedging ratios, pinpointing the impact of price velocity, time erosion, and volatility spikes.
Spread Strategies	Bull Call Spread, Bear Put Spread, Straddle, Covered Call.	Multi-leg spreads cap downside hazards, shifting reliance from directional prediction to statistical edge.
Taxation & Audit	Non-Speculative Business Income u/s 43(5), Absolute Turnover, Sec 44AB.	Allows deduction of trading expenses; digital turnover threshold of ₹10 Cr applies for tax audit mandates.

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