

**BBA 8<sup>th</sup> Semester**  
**Financial Derivatives**  
**Chapter Description**

- Introduction
- ∟ Structure of Option Market
- ∟ Pricing of Option
- ∟ Binomial Option Pricing Model
- ∟ Black–Scholes Merton Option Pricing Model
- ∟ Option Strategies
- ∟ Pricing and Valuation of Forward and Futures
- ∟ Swaps
- ∟ Financial Risk Management



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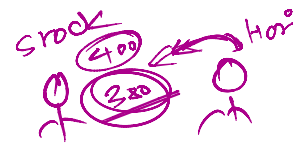
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# Chapter 01 : Introduction

## Content Covered

- Concept
- Features and Reason For Derivatives
- Derivatives market and Insurance
- Core concept of Financial Derivatives
- Types of Traders and Role of Derivatives Market
- Criticism and Misuses of Derivatives and Careers in derivative market

↓ Instruments



## Meaning

Financial Derivatives are contracts to buy or sell underlying assets ( whose values is linked or derived from other assets) at a predetermined price at a certain future price.

*A derivative is a financial contract between two parties used to hedge risk, whose value is derived from an underlying asset such as a bond, stock, currency, commodity, or other asset.*

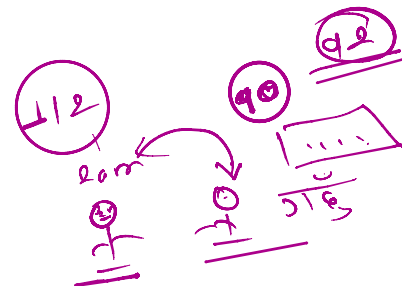
A financial derivative is a contract between two parties whose value is based on the price of an underlying financial asset and is used for hedging, speculation, or risk management.

**Note:** - underlying assets means the assets upon which a derivative contract is based upon



## Features of Financial Derivatives

- Two parties
- Underlying Assets
- Expiration
- Future Transaction
- Exercise Price
- Right to Obligation
- Zero-sum Game



- h. Nominal Amount
- i. Minimal Initial Investment

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### **a. Two Parties**

A financial derivative involves two parties, namely the buyer and the seller, who agree to enter into a contract to exchange value based on underlying asset performance.

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### **b. Underlying Assets**

Derivatives derive their value from underlying assets such as stocks, bonds, commodities, interest rates, or currencies, which determine the price and payoff of the contract.

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### **c. Expiration**

Every derivative contract has a fixed expiration date, on which the contract must be settled, exercised, or become void, depending on the agreement between both parties.

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### **d. Future Transaction**

Derivative contracts are based on future transactions, meaning the agreement is made today, but the actual exchange of value or settlement occurs at a later date.

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### **e. Exercise Price**

Exercise price is the predetermined price at which the buyer of the derivative can buy or sell the underlying asset, regardless of the current market price.

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### **f. Right to Obligation**

In derivatives like options, the buyer has the right but not the obligation to execute the contract, while the seller has the obligation to fulfill it.

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### **g. Zero-sum Game**

Derivatives operate as a zero-sum game, where the gain of one party is exactly equal to the loss of the other party in the contract.

# REASON FOR DERIVATIVES

Reasons for derivatives refer to the purposes or causes why investors and firms use derivative contracts in financial markets.

- a. Speculation.
- b. Risk Management.
- c. Arbitrage Opportunity.
- d. Price Discovery.
- e. Leverage Benefit.
- f. Liquidity Improvement.
- g. Risk Transfer.

## 1. Hedging Risk

Derivatives are mainly used to reduce financial risk by protecting against unfavorable price changes in assets like stocks, currencies, or commodities, ensuring stability and minimizing potential financial losses.

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## 2. Speculation

Investors use derivatives to speculate on future price movements of assets and earn profit without actually owning them, taking advantage of market fluctuations and price changes.

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## 3. Arbitrage Opportunity

Derivatives provide arbitrage opportunities by allowing traders to exploit price differences of the same asset in different markets, enabling them to earn risk-free profit through simultaneous buying and selling.

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## 4. Price Discovery

Derivatives help in price discovery by reflecting market expectations about future prices of underlying assets, thereby providing useful information to investors and improving market efficiency.

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## 5. Leverage Benefit

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Derivatives offer leverage, allowing investors to control large positions with a small initial investment, increasing potential returns but also increasing the risk of higher losses.

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## 6. Liquidity Improvement

Derivatives enhance market liquidity by increasing trading volume, making it easier for investors to buy and sell assets quickly without significantly affecting market prices.

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## 7. Risk Transfer

Derivatives facilitate the transfer of risk from one party to another, allowing risk-averse investors to shift risk to those who are willing to accept it.

# Derivatives markets and Instruments

A derivatives market is a financial market where derivative contracts are traded, whose value is based on underlying assets like shares, commodities, or currencies. The derivatives market is a financial market where contracts are traded whose value is derived from underlying assets such as shares, bonds, commodities, currencies, or interest rates.

Types of Derivatives Markets

(V.V.D)

Reason, feature, meaning

- a. Over-the-counter market
- b. Exchange Traded Derivatives Market

- A. A decentralized market where derivatives are traded directly between two parties. The **Over-the-Counter (OTC) market** is a decentralized financial market where derivatives are traded directly between two parties, without going through a formal exchange. There are no rules and regulations to exchange the stock, which is governed by the authority it has a high risk.

**Features:**

- Contracts are customized.
- No central exchange.
- Higher counterparty risk.

Examples: Forward contracts, Swaps.

B. The Exchange-Traded Derivatives (ETD) Market is a regulated market where derivative contracts are traded through organized exchanges, with standardized terms and central clearing.

**Key Points:**

- Contracts are standardized in terms of size, expiry, and price.
- Traded on a formal exchange with transparency.
- Central clearinghouse reduces counterparty risk.
- High liquidity and easy settlement.

*daily settlements* →

Examples: Futures contracts, Options contracts.

**Derivatives Instruments**

Derivatives instruments are financial contracts whose value is derived from an underlying asset such as shares, bonds, commodities, currencies, or interest rates. They are mainly used for hedging, speculation, and risk management.

Types

- Forward Contract
- Swaps and other derivatives
- Options
- Futures Contract

TYPES OF DEREVATIES		
TYPE	DESCRIPTION	MEANS OF TRADE
<b>Futures</b>	Parties Agree to Trade an Asset at a Set Price and Expiration Date.	Exchange-Traded.
<b>Forwards</b>	Parties Agree to Trade an Asset at a Set Price and Expiration Date.	Over-The-Counter.
<b>Options</b>	Involves the Right To Trade an Asset at a Set Price On or Before Expiration Date With No Obligation.	Exchange-Traded or Over-The-Counter.
<b>Swaps</b>	Parties Agree to Exchange Cash Flows From Investments.	Over-The-Counter.

### a. Forward Contract

A forward contract is a customized agreement between two parties to buy or sell an underlying asset at a predetermined price on a specified future date. It is traded **over-the-counter (OTC)** and mainly used for hedging against price fluctuations in currencies, commodities, or financial instruments.

#### Features:

- **Customized contract** – tailored to parties' needs.
  - **OTC trading** – not traded on exchange.
  - **Hedging tool** – reduces future price risk.
  - **Obligation** – both parties are legally bound to execute.
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### b. Swaps and Other Derivatives

A swap is a derivative contract in which two parties agree to exchange cash flows or financial instruments, usually to manage interest rate or currency risk. Other derivatives include contracts like forwards, futures, and options, which allow risk management, speculation, or arbitrage based on underlying asset prices.

#### Features:

- **Customized contracts** – mainly OTC.
  - **Cash flow exchange** – interest rates, currencies, or commodities.
  - **Risk management** – hedges financial exposures.
  - **Long-term instruments** – usually months to years.
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### c. Options

An option is a derivative contract that gives the buyer the **right, but not the obligation**, to buy (call) or sell (put) an underlying asset at a predetermined price within a specific period. Options can be used for hedging, speculation, or income generation through premiums.

#### Features:

- **Right without obligation** – only the buyer has choice.
- **Premium paid** – buyer pays upfront for the option.
- **Call and Put types** – buy or sell rights.

- **Traded OTC or on exchange** – flexibility and liquidity.

#### d. Futures Contract

A futures contract is a standardized agreement to buy or sell an underlying asset at a specified price on a future date. Unlike forwards, futures are **exchange-traded**, regulated, and used for hedging price risk or speculation in commodities, stocks, or financial instruments.

#### Features:

- **Standardized contracts** – size, price, expiry fixed.
- **Exchange-traded** – regulated and transparent.
- **Daily settlement (Mark-to-market)** – reduces counterparty risk.
- **Hedging and speculation** – widely used in financial markets.

## Types of traders

- Hedger or Hedger Strategy
- Speculators or Speculators Strategy
- Arbitrangers or Strategy



## ☐Hedgers

Hedgers are traders who use derivatives to **protect themselves against the risk of price fluctuations** in underlying assets. They aim to minimize potential losses by locking in prices or rates, rather than seeking profit. Hedging ensures stability for businesses or investors.

### Key Points:

- Reduce risk from price changes
  - Protect investment value
  - Use forwards, futures, options
  - Example: Company locking commodity prices
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## ☒Speculators

Speculators are traders who use derivatives to **profit from future price movements** of underlying assets. They assume high risk, hoping the market moves in their favor. Unlike hedgers, they are focused on earning gains rather than reducing risk.

### Key Points:

- Aim to earn profit from price changes
  - Take high risk
  - Do not own underlying asset
  - Example: Buying call options anticipating stock rise
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## ☒Arbitrageurs

Arbitrageurs exploit **price differences of the same asset in different markets** to earn risk-free profits. They buy low in one market and sell high in another simultaneously. Their actions help maintain price efficiency and balance between markets.

### Key Points:

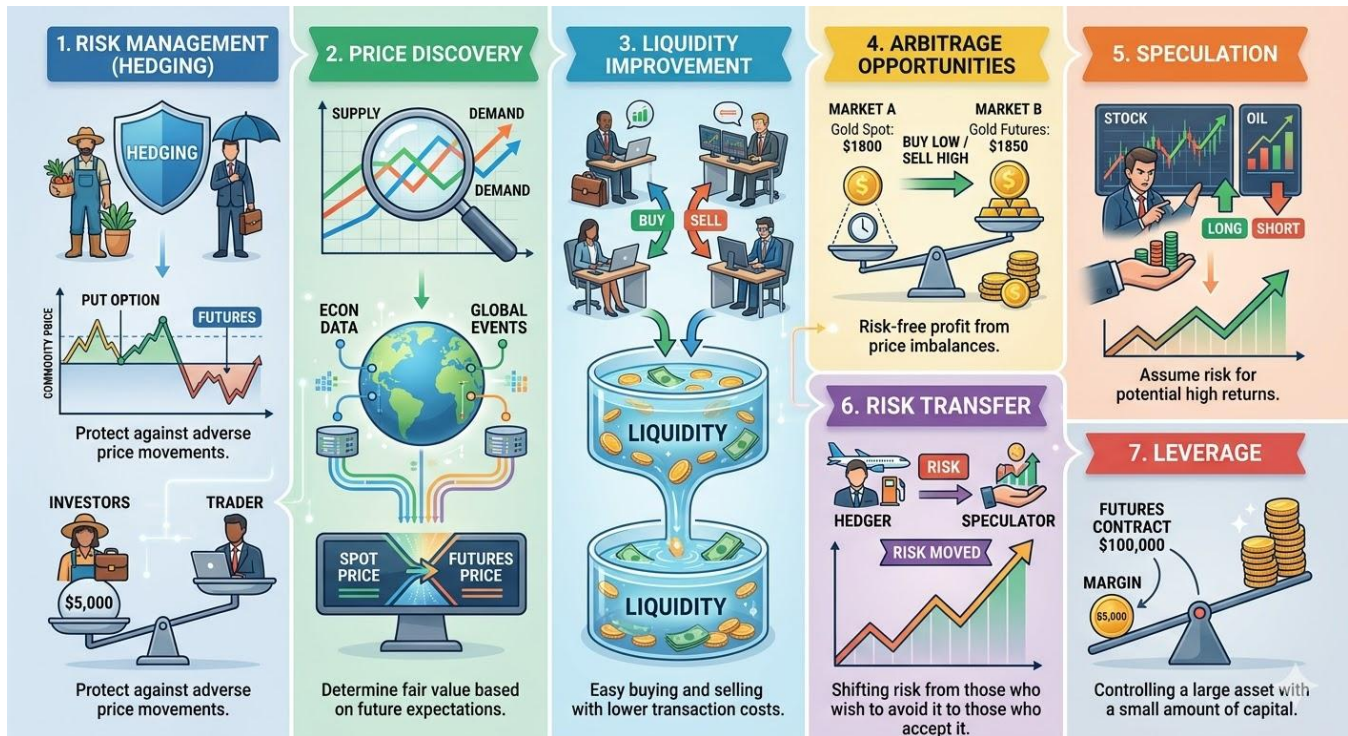
- Earn risk-free profit
- Exploit market inefficiencies
- Ensure price convergence

- Example: Buying commodity in one market, selling in another

## Other types of traders

- Institutional traders
- Retailers traders

# Role of Derivative Market



# Criticism of Derivative Markets



# 1. Excessive Speculation and Volatility

Critics argue that derivatives can turn markets into "casinos" where the focus shifts from productive investment to pure gambling.

- **Artificial Volatility:** Large-scale speculative trading in derivatives can cause the price of the underlying asset (like oil or wheat) to swing wildly, regardless of actual supply and demand.
  - **Impact on Real Goods:** When speculators drive up the price of food or energy through derivatives, it creates real-world inflation and hardship for consumers.
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# 2. The Dangers of High Leverage

As we discussed earlier, derivatives allow for massive leverage.

- **Magnified Losses:** While leverage increases potential gains, it also means a small price movement can completely wipe out a trader's capital and leave them owing more than they started with.
  - **Margin Calls:** Rapid price drops can trigger "margin calls," forcing traders to sell other assets quickly to cover losses, which can lead to broader market crashes.
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# 3. Complexity and Lack of Transparency.

Many derivative products are so mathematically complex that even the people selling them may not fully understand the underlying risks.

- **Over-the-Counter (OTC) Trading:** A large portion of derivatives are traded "off-exchange" (OTC) through private contracts. This lack of a central clearinghouse makes it difficult for regulators to see how much total risk is building up in the system.
  - **Information Asymmetry:** Sophisticated institutions often have a massive advantage over smaller investors or "hedgers," leading to predatory practices.
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# 4. Counterparty Risk

In a derivative contract, you are only as safe as the person or institution on the other side of the deal. **Default Risk:** If your counterparty goes bankrupt (like Lehman Brothers did), your

"hedge" becomes worthless exactly when you need it most. This creates a "hollow" sense of security.

## Derivatives and Ethics

Derivatives are financial instruments used for hedging, speculation, and arbitrage. Ethics in derivatives refers to conducting trading in a honest, fair, and transparent manner, avoiding market manipulation, insider trading, or misuse of sensitive information.

It includes

- Code of conduct
- Standard
- Fairness
- Transparency

## Importance of Ethics

- Maintains market integrity
- Builds investor confidence
- Reduces financial risk and systemic instability
- Ensures fair and efficient markets

## Career in Derivative Markets

- a. Financial Management in Business
- b. Small Business Ownership.
- c. Investment Management
- d. Public service



## **1. Financial Management in Business**

Corporate financial management uses derivatives primarily for hedging against the significant risks that large enterprises face. These risks include currency fluctuations, interest rate changes, and volatile commodity prices. Financial Analysts and Treasury Managers employ sophisticated financial modeling and quantitative analysis to build a strong market understanding, allowing the company to minimize financial risk and maximize returns.

## **2. Small Business Ownership**

Small business owners can adapt institutional-level tools, such as futures, options, and swaps, to secure predictable costs and manage cash flow efficiently. This enables entrepreneurs to protect their business from raw material price volatility, which is crucial for reliable planning and budgeting. This path requires founders and owners to develop strong financial literacy and strategic planning skills to stay competitive.

## **3. Investment Management**

Professionals in this field manage large portfolios of assets, including stocks, bonds, and derivatives. For Portfolio Managers and Hedge Fund Analysts, derivatives serve a triple purpose: hedging against specific risks, engaging in sophisticated speculation, and improving overall portfolio returns. This career path demands strong analytical, quantitative, and market research skills to optimize the risk-return balance for clients.

## **4. Public Service**

Public sector entities, including government agencies and regulatory bodies, use derivatives for economic stability and risk management. For Policy Analysts and Treasury Officers, monitoring financial markets and advising on financial policies are key responsibilities. Derivatives are used here to hedge national financial risks, like currency or interest rate fluctuations on public debt, which requires deep knowledge of economics, finance, and regulatory frameworks.