Unit-I: Introduction to Derivatives

Introduction: Development and Growth of Derivative Markets - Types of Derivatives Fundamental Linkages between Spot & Derivative Markets - The Role of Derivatives Market- Uses & Misuses.
Commodity Exchanges: Role - Functions - Trading - National and Regional Exchanges.

Introduction: Development and Growth of Derivative Markets - Types of Derivatives Fundamental Linkages between Spot & Derivative Markets - The Role of Derivatives Market- Uses & Misuses.
Commodity Exchanges: Role - Functions - Trading - National and Regional Exchanges.

Derivative (Definition): Derivative is a product which derives its value from another product(s) called underlying asset. Financial Derivative is a financial where its value derived from any underlying asset(s) which may include Equity, Index, Commodity, Currency, Live stock etc.

The underlying asset may assume many forms:

i. Commodities including grain, coffee beans, orange juice;
ii. Precious metals like gold and silver;
iii. Foreign exchange rates or currencies;
iv. Bonds of different types, including medium to long term negotiable debt securities issued by governments, companies, etc.
v. Shares and share warrants of companies traded on recognized stock exchanges and Stock Index
vi. Short term securities such as T-bills; and
vii. Over- the Counter (OTC)2 money market products such as loans or deposits.

History and Growth of derivatives:

Derivatives markets in India have been in existence in one form or the other for a long time. In the area of commodities, the Bombay Cotton Trade Association started futures trading way back in 1875. In 1952, the Government of India banned cash settlement and options trading. Derivatives trading shifted to informal forwards markets. In recent years, government policy has shifted in favour of an increased role of market-based pricing and less suspicious derivatives trading. The first step towards introduction of financial derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance, 1995. It provided for withdrawal of prohibition on options in securities. The last decade, beginning the year 2000, saw lifting of ban on futures trading in many commodities. Around the same period, national electronic commodity exchanges were also set up.

Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2001 on the recommendation of L. C Gupta committee. Securities and Exchange Board of India (SEBI) permitted the derivative segments of two stock exchanges, NSE3 and BSE4 , and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. Initially, SEBI approved trading in index futures contracts based on various stock market indices such as, S&P CNX, Nifty and Sensex. Subsequently, index-based trading was permitted in options as well as individual securities. The trading in BSE Sensex options commenced on June 4, 2001 and the trading in options on individual securities commenced in July 2001. Futures contracts on individual stocks were launched in November 2001. The derivatives trading on NSE commenced with S&P CNX Nifty Index futures on June 12, 2000.

The trading in index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. The index futures and options contract on NSE are based on S&P CNX. In June 2003, NSE introduced Interest Rate Futures which were subsequently banned due to pricing issue.

Types of Derivatives

Forwards: A forward contract is an agreement between two parties to buy or sell an asset at a specified point of time in the future. In case of a forward contract the price which is paid/ received by the parties is decided at the time of entering into contract. It is the simplest form of derivative contract mostly entered by individuals in day to day's life. Forward contract is a cash market transaction in which delivery of the instrument is deferred until the contract has been made. Although the delivery is made in the future, the price is determined on the initial trade date.

Futures: Futures is a standardized forward contact to buy (long) or sell (short) the underlying asset at a specified price at a specified future date through a specified exchange. Futures contracts are traded on exchanges that work as a buyer or seller for the counterparty. Exchange sets the standardized terms in term of Quality, quantity, Price quotation, Date and Delivery place (in case of commodity). Futures contracts being traded on organized exchanges impart liquidity to the transaction. The clearinghouse, being the counter party to both sides of a transaction, provides a mechanism that guarantees the honouring of the contract and ensuring very low level of default.

Options: An options contract offers the buyer the opportunity to buy or sell—depending on the type of contract they hold—the underlying asset. Unlike futures, the holder is not required to buy or sell the asset if they decide against it. Each options contract will have a specific expiration date by which the holder must exercise their option. The stated price on an option is known as the strike price.

Types of Options

Call Option: A call option gives the holder the right, but not the obligation, to buy the underlying security at the strike price on or before expiration. A call option will therefore become more valuable as the underlying security rises in price (calls have a positive delta).

A long call can be used to speculate on the price of the underlying rising, since it has unlimited upside potential but the maximum loss is the premium (price) paid for the option.

Put Options: Opposite to call options, a put gives the holder the right, but not the obligation, to instead sell the underlying stock at the strike price on or before expiration. A long put, therefore, is a short position in the underlying security, since the put gains value as the underlying's price falls (they have a negative delta). Protective puts can be purchased as a sort of insurance, providing a price floor for investors to hedge their positions.

SWAPs: A swap is a derivative contract between two parties that involves the exchange of pre-agreed cash flows of two financial instruments. The cash flows are usually determined using the notional principal amount (a predetermined nominal value). Each stream of the cash flows is called a "leg."

Fundamental linkage between Cash market and Derivative market

Cash markets are the markets that trade-in cash for commodities or assets and receive them at the point of sale. This is the underlying difference between a cash market and a derivative market. Few other differences between the cash market and derivative markets are discussed below.

Category	**Cash market**	**Derivatives market**
Lot sizes	In cash markets, investors can buy or sell in any quantity or even in single units	In derivatives markets, the lot sizes are fixed and single units are not available
Nature of assets	Cash market trade only in tangible assets	Derivatives markets can be used to trade in tangible or intangible assets.
Trading mode	In cash markets, investors need a trading and Demat account	In the derivative market, investors need only a future trading account
Dividends	In cash markets, the investors have the right to dividends	In derivative markets, investors have no rights on the dividends
Ownership	Investors have the ownership of the asset (share) purchased by them	Investors do not have any ownership of the asset purchased by them.

Participants of the derivatives market:

Derivative markets consist of four major participants. Given below are a few details of the same.

1. **Hedgers**

Hedgers are the investors that invest in the derivatives market to eliminate the risk of any change in the future prices of the asset. The primary intention is to secure the existing exposure in the market or to reduce the risk and not to earn profits.

2. **Speculators**

Speculators are traders who predict the prices of an asset or derivative based on the future movement of the underlying asset and take calculated risks to earn profits. It is the most common market activity.

3. **Arbitrageurs**

Arbitrage is the activity of earning profit based on the difference in prices of an asset in two different markets. Arbitrageurs purchase an asset at a lower price in one market and sell it in another market at a higher price to gain profits.

Role of Derivative Market

Major functions of derivatives markets

There are 6 major functions of derivatives markets in an economy. These include:

Risk Management

One of the primary functions of derivatives markets is to effectively manage risks. Businesses face multiple risks in day-to-day operations, including currency fluctuations, interest rate changes, and commodity price volatility. Derivative contracts help companies hedge against these risks, drive profitability and ensure stable operations.

Price Discovery

Derivatives offer a platform for traders and investors to express their views on future asset prices. These price signals are critical for investors, as they help assess market sentiment and make informed investment decisions. They also enable efficient allocation of resources by providing real-time insights about market expectations.

Liquidity Enhancement

Derivatives markets significantly enhance market liquidity - the ease with which an asset can be bought or sold without causing a sharp rise/decline in prices. This liquidity benefits both hedgers and speculators. Hedgers can easily find counterparties to take the other side of their trades, while speculators can execute their strategies efficiently.

Capital Efficiency

Derivatives markets promote capital efficiency by increasing the exposure to underlying assets without the need for large capital outlays. Derivatives allow a trader to control a significant position in a stock index by purchasing futures contracts that require only a fraction of the underlying asset's value as margin. This helps you to diversify portfolios and optimize capital allocation.

Risk Transfer

Derivatives markets facilitate risk transfer from those who are less capable of withstanding risk to those who are more risk-tolerant. For instance, an insurance company may use derivatives to transfer the risk of catastrophic events, such as natural disasters or financial market crashes to the broader financial market. This risk transfer mechanism helps mitigate systemic risk, distributing it among a broader pool of market participants.

Speculation and Investment Opportunities

Traders, investors, and speculators can significantly benefit from derivatives markets. Traders can profit from price movements in various asset classes without owning the underlying assets. This ability to speculate on market movements provides a crucial avenue for market participants to express their views and generate returns.

Commodity Exchanges

A commodity market is where you can buy and sell goods taken from the earth, from cattle to gold, oil to oranges, and orange juice to wheat. Commodities can be turned into products like baked goods, gasoline, or high-end jewelry, which in turn are bought and sold by consumers and other businesses. Markets in these goods are the oldest in the world, but they are as crucial to the most modern societies as they were to the small trading communities of ancient civilizations.

1. Multi Commodity Exchange of India (MCX)

MCX is one of the most prominent commodity exchanges in India, specializing in a diverse range of commodities. Established in 2003, MCX offers futures and options contracts for various commodities, including metals (gold, silver, copper), energy (crude oil, natural gas), and agricultural products (soybean, cotton, chana, etc.). MCX has earned a reputation for its robust trading platform and efficient risk management systems.

MCX provides transparency in trading, price discovery, and risk management. Traders and investors can access MCX through a vast network of brokers and trading terminals.

2. National Commodity and Derivatives Exchange (NCDEX)

NCDEX is a dedicated agricultural commodity exchange in India, established in 2003. It plays a crucial role in the trading of agricultural commodities, such as cereals (wheat, rice), pulses (chana, tur), spices (jeera, pepper), and oilseeds (soybean, castor). NCDEX offers a platform for farmers and other stakeholders in the agricultural sector to hedge against price volatility and secure their future incomes.

One of the distinctive features of NCDEX is the delivery-based settlement system, ensuring that actual commodities are delivered to the buyer on the contract's maturity. This provides a real-world connection between commodity trading and the physical market.

3. National Multi Commodity Exchange (NMCE)

NMCE is another commodity exchange focusing on agricultural and non-agricultural commodities. Established in 2002, it provides a platform for trading in various goods, including spices, oilseeds, metals, and energy products. NMCE offers futures contracts and electronic trading facilities to market participants.

NMCE also plays a pivotal role in the agricultural sector, helping farmers, traders, and other stakeholders manage their price risks and improve their income stability. It stands out for its comprehensive basket of commodities and an efficient trading infrastructure.

4. Indian Commodity Exchange (ICEX)

ICEX is a relatively new entrant in the Indian commodity market, established in 2009. It primarily focuses on trading in diamond derivatives, offering a unique platform for hedging against the price fluctuations of these precious stones. ICEX is known for bringing transparency to diamond trading and allowing participants to buy and sell standardized diamond contracts.

While ICEX specializes in diamond trading, it aims to expand its offerings to other commodities in the future, making it an interesting player in the Indian commodity exchange landscape.

5. ACE Derivatives & Commodity Exchange Limited

ACE Derivatives & Commodity Exchange Limited is a commodity exchange founded in 2010. It offers trading opportunities in various agricultural and non-agricultural commodities, including guar gum, guar seeds, soya oil, and mustard seeds. ACE is recognized for its strong technology infrastructure and innovative trading solutions.

6. Universal Commodity Exchange Limited

Universal Commodity Exchange Limited, established in 2012, is yet another platform for trading in a wide spectrum of commodities, including agricultural products, metals, and energy commodities. It is known for its commitment to providing transparent and efficient trading mechanisms.

Role and functions of Commodity Exchanges in India

Realizing the importance of the commodities market in India, the role of the commodities market in India is pivotal to the country's growth and safeguarding the interest of its citizens. The market plays its role through the following factors:

Food Security: The commodities market in India play a crucial role in ensuring that the suppliers of commodities are protected against falling prices. They can utilise the commodities futures contracts to lock in a price that they think is apt for their products. It ensures that there will be an adequate supply of commodities throughout the country.

Better agriculture infrastructure: Within the commodities market, farmers suffer at the hands of inadequate post-harvest infrastructure. Even though they produce a high quantity of commodities, the lack of adequate warehousing, transport etc., forces them to suffer losses. Commodities market offers profits to farmers, brokers, intermediaries and customers. Thus, attracting investments in the agriculture sector in the hope of better long term profits.

An organised platform: Before the commodities market, the farmers or the suppliers of commodities only relied on middlemen to sell their products. It forced them to take whatever amount the middlemen offered. However, today, the commodity market ensures that they can utilise an organised platform to trade their commodities and realise an adequate price.

A new asset class: The role of the commodities market is not limited to farmers or suppliers but extends to offer a new asset class for investors seeking profits. By trading in commodities, they can hedge against losses from other asset classes, diversify their portfolio, while helping in the overall growth of the commodity sector in India.

Mitigates Volatility: This is one of the most important roles of the commodity market in India. It helps protect the originator of the risk and results in the overall distribution of the risk exposure. For example, a jeweller can sell a gold futures contract to avoid any rise in the gold prices in the upcoming months. However, the same futures contract can be bought by an investor with the intention that the gold prices will rise in the future. Through the contract, the risk gets distributed and mitigates a high level of volatility.

The role of the commodity market in India is the most important one in all as it directly affects the economy's growth and positively influences the agriculture sector. For further assistance on how to trade commodities, you can consult IIFL's financial experts to gain valuable insights and start your commodity trading journey successfully.

Unit-II: Future and Forward Market

Structure of Forward and Future Markets: Mechanics of Future Markets - Hedging Strategies Using Futures - Determination of Forward and Future Prices.
Types of Futures: Interest rate Futures - Currency Futures and Forwards.

Futures: Futures is a standardized forward contact to buy (long) or sell (short) the underlying asset at a specified price at a specified future date through a specified exchange. Future contracts are traded on exchanges that work as a buyer or seller for the counterparty.

Exchange sets the standardized terms in term of Quality, quantity, Price quotation, Date and Delivery place (in case of commodity). Futures contracts being traded on organized exchanges impart liquidity to the transaction. The clearinghouse, being the counter party to both sides of a transaction, provides a mechanism that guarantees the honouring of the contract and ensuring very low level of default.

Standardized terms of Futures include:

- Contract size,
- delivery months,
- last trading day,
- delivery location,
- specification of grades, and
- quality of the commodity.

The standardization enhances liquidity, by making it possible for large numbers of market participants to trade the same instrument. This liquidity makes the contract more useful for hedging.

Clearinghouses Futures trades that are made on an exchange are cleared through clearinghouses. When a trader enters into a futures contract, he is technically buying from or selling to, the clearinghouse rather than the party with whom he executed the transaction on the trading floor or through an electronic trading platform.

Margins

In futures trading, the entire value of a contract need not be paid but only a certain per cent of the contract value called margin is paid. Margin is typically between 2% and 10% of the total value of the contract. There are different types of margins levied while trading in futures.

Initial margin is paid when a futures trader enters into a futures position, as specified by the futures exchange. Thereafter, the margin amount varies based on "marked-to-market" and the margin amount will be adjusted automatically according to the changes in futures price.

Special margin is levied in addition to the prevailing margin typically when the prices of the commodity become volatile beyond certain acceptable level specified by the exchange or the regulator (FMC).

Risk Management Strategies

Primary purpose of derivatives trading in commodities is aimed to reduce price risk from the seasonal fluctuations. The strategies of risk management include hedging, speculation and arbitrage.

Hedging is an economic function that helps to reduce the price risks in commodities significantly, if not eliminate altogether. Hedging is the practice of off-setting the price risk inherent in any cash market position by taking an equal but opposite position in the futures market.

Futures markets believed to be originally developed to meet the requirements of producers who wanted to hedge against the price risk arising from seasonal fluctuations. However, the scope of commodity futures has expanded latter with widespread participation of producers, traders and users of commodities. Hedger is the person who has a position in physical market and wants to avoid the risk.

Hedging will be effective only when the following requirements are met

- Driven by the demand and supply over a period the prices of cash and futures markets tend to move together
- As the maturity date approaches, cash and futures prices tend to converge or reach an acceptable difference.

Process: Hedging in the futures market in general is a two-step process, depending upon the hedger's cash market situation.

First step: If the hedger is going to buy a commodity in the cash market at a later time, his first step is to buy futures contracts. Or if he is going to sell in cash commodity at a later time, his first step in the hedging process is to sell futures contracts.

Second step: when the cash market transaction takes place, the futures position is no longer needed for price protection and should therefore be closed. Depending on the initial position taken long or short, hedger would offset his position by selling or buying back the futures contract.

For example, in June if a farmer expects an output of 100 tonnes of soyabean in October. Soyabean prices in October are expected to rule relatively lower as it is harvesting season for soya bean. In order to hedge against the price fall, the farmer sells 100 contracts of one ton each at Rs.1347 in June. On a fall of price to Rs.1216 per ton in October he makes a profit of Rs.131 per ton.

Speculation: Contrary to the hedging, speculation involves risk with no cash market position. Speculators take risk that hedgers want to avoid with a motive to make profits and provide the necessary liquidity through bid-offers that result into a continuous flow of transactions. Commodities are becoming increasingly attractive to investor as an alternative asset class that may allow reduction in overall risk of financial portfolio and enhance returns. Unlike in spot markets, he has to invest only a margin amount instead of the total amount and can gain profits to the total extent.

Basis and Basis risk

Understanding basis risk is fundamental for hedging in futures trading

Basis = Spot price – Futures price

Where T is maturity period and t is a specific date

It is normally quoted as premium or discount in relation to the cash price.

If Sp > Fp then basis is said to be OVER future and called premium

If Sp < Fp then basis is said to be UNDER futureand called discount

Basis risk exists when futures and spot prices do not change in the same magnitude and may not converge at maturity on account of the physical attributes of the commodities including grade, location and chemical composition etc., It is now common that the market participants analyse their risk in a mark-to-market perspective at date 't'. As a result, the basis risk is often defined as the variance of the basis.

Price Discovery

Futures contracts are often relied upon for price discovery as well as for hedging. In many commodities, cash market participants typically base spot and forward prices on the futures prices that are "discovered" in the competitive, open auction market of a futures exchange. This is considered to be an important economic purpose of futures markets. In financial futures contracts such as stocks, interest rates, and foreign currency, the price discovery role of futures occurs in tandem with the cash markets, which also contribute significantly to price discovery.

Types of Futures Contracts

Futures contracts can be used to set prices on any type of commodity or asset, so long as there is a sufficiently large market for it. Some of the most frequently traded types of futures are outlined below:

- **Agricultural Futures:** These were the original futures contracts available at markets like the Chicago Mercantile Exchange. In addition to grain futures, there are also tradable futures contracts in fibers (such as cotton), lumber, milk, coffee, sugar, and even livestock.
- **Energy Futures:** These provide exposure to the most common fuels and energy products, such as crude oil and natural gas.
- **Metal Futures:** These contracts trade in industrial metals, such as gold, steel, and copper.
- **Currency Futures:** These contracts provide exposure to changes in the exchange rates and interest rates of different national currencies.
- **Financial Futures:** Contracts that trade in the future value of a security or index. For example, there are futures for the S&P 500 and Nasdaq indexes. There are also futures for debt products, such as Treasury bonds.

Forwards: A forward contract is an agreement between two parties to buy or sell an asset at a specified point of time in the future. In case of a forward contract the price which is paid/ received by the parties is decided at the time of entering into contract. It is the simplest form of derivative contract mostly entered by individuals in day to day's life. Forward contract is a cash market transaction in which delivery of the instrument is deferred until the contract has been made. Although the delivery is made in the future, the price is determined on the initial trade date.

BASIS FOR COMPARISON	FORWARD CONTRACT	FUTURES CONTRACT
Meaning	Forward Contract is an agreement between parties to buy and sell the underlying asset at a specified date and agreed rate in future.	A contract in which the parties agree to exchange the asset for cash at a fixed price and at a future specified date, is known as future contract.
What is it?	It is a tailor made contract.	It is a standardized contract.
Traded on	Over the counter, i.e. there is no secondary market.	Organized stock exchange.
Settlement	On maturity date.	On a daily basis.
Risk	High	Low
Default	As they are private agreement, the chances of default are relatively high.	No such probability.
Size of contract	Depends on the contract terms.	Fixed
Collateral	Not required	Initial margin required.
Maturity	As per the terms of contract.	Predetermined date
Regulation	Self regulated	By stock exchange
Liquidity	Low	High

Types of futures

Interest Rate Futures

- Interest rate futures are futures contracts based on an interest-bearing financial instrument.
- The contract can be cash-settled or it can involve the delivery of the underlying security.
- These futures contracts can be used for hedging or speculative purposes.

Interest rate futures, as mentioned before, can have any interest-bearing security as the underlying asset. These futures contracts are a legal agreement to either deliver the interest-bearing security at expiration or settle the contract in cash. Most often, futures are cash-settled. Interest rate futures are traded on centralized exchanges and have a few specific components.

- **Underlying asset** – the interest-bearing security the value of the interest rate future is dependent on
- **Expiration date** – the date on which the contract will be settled, either through physical delivery or if it is cash settled, this will be the last cash settlement
- **Size** – the total nominal amount of the contract
- **Margin requirement** – For cash-settled futures, this is the initial amount needed to enter into the futures contract, as well as the maintenance margin that the initial margin will need to stay above

There are a number of different types of interest rate futures, depending on the underlying instrument. These futures can also be short-term or long-term. Short-term interest rate futures have an underlying instrument with a maturity of less than one year, while long-term interest rate futures have an underlying instrument with a maturity of over one year.

Currency Futures

Currency futures are contracts that allow exchanging one currency for another at a pre-determined price on a future date. The contract rate is based on the current spot rates for the currency pair. Currency futures are commonly used to manage the risk of receiving payments in a foreign currency.

- Currency futures are futures contracts for currencies that specify the price of exchanging one currency for another at a future date.
- The rate for currency futures contracts is derived from spot rates of the currency pair.
- Currency futures are used to hedge the risk of receiving payments in a foreign currency.

Glossary

Basis- Is the price gap of an asset between cash market and futures market.

Cash settlement: On the expiry of futures contract the parties will settle with cash.

M2M: Mark to Market: In a futures contract is the process of daily settlement of profit and losses arising due to the change in the security's market value until it is held.

Margin: Margin money is a deposit to secure a futures position while it is open. Margins must be maintained at the level required by the brokerage firm. When the futures position is closed, the remaining margin money after trade settlement can be returned to the account holder.

Open Interest: Open interest is the total number of outstanding derivative contracts for an asset—such as options or futures—that have not been settled. Open interest keeps track of every open position in a particular contract rather than tracking the total volume traded.

Spot/Cash Market: The market where immediate delivery happens of the assets.

Spread: Is the price differences of an underlying asset in futures market.

Underlying Asset: Underlying asset is an investment term that refers to the real financial asset or security that a financial derivative is based on. Underlying assets include stocks, bonds, commodities, interest rates, market indexes, and currencies.

Unit-III: Options

Options Market: Distinguish between Options and Futures - Structure of Options Market - Principles of Option Pricing.

Option Pricing Models: The Binomial Model - The Black-Scholes Merton Model.

Introduction and Meaning of Options

An option is a derivative, a contract that gives the buyer the right, but not the obligation, to buy or sell the underlying asset by a certain date (expiration date) at a specified price (strike price). There are two types of options: calls and puts. American-style options can be exercised at any time prior to their expiration. European-style options can only be exercised on the expiration date.

Options are financial derivatives that give buyers the right, but not the obligation, to buy or sell an underlying asset at an agreed-upon price and date. Options trading can be used for both hedging and speculation, with strategies ranging from simple to complex. Although there are many opportunities to profit with options, investors should carefully weigh the risks.

Difference between Options and Futures:

OPTIONS CONTRACTS	FUTURES CONTRACTS
Meaning	
Options are the agreement or contracts wherein the financial backer or investor gets the option or right to trade the monetary instrument at a set cost prior to a specific date; in any case, the financial backer isn't committed to doing as such.	A futures contract is an official understanding or agreement for the trading of a monetary instrument at a foreordained cost at a future determined date.
Risk	
They are subjected to limited risk.	They are subjected to high risk.
Level of Profit or Loss	
It can reap either unlimited profit or loss	It can also reap unlimited profit or loss
Buyers Obligation	
The buyer has no obligation.	The buyer has an obligation to execute the contract.
Contract Execution	

The contract can be executed anytime before the expiry of the agreed date.	The contract can be executed on the agreed date.
Advance Payment	
Advance is paid in the form of premiums.	No advance payments are made.

Call options

Calls give the buyer the right, but not the obligation, to buy the underlying asset at the strike price specified in the option contract. Investors buy calls when they believe the price of the underlying asset will increase and sell calls if they believe it will decrease.

Pay-Off pattern of Call Options

The buyer of a call option pays the option premium in full at the time of entering the contract. Afterward, the buyer enjoys a potential profit should the market move in his favor. There is no possibility of the option generating any further loss beyond the purchase price. This is one of the most attractive features of buying options. For a limited investment, the buyer secures unlimited profit potential with a known and strictly limited potential loss.

If the spot price of the underlying asset does not rise above the option strike price prior to the option's expiration, then the investor loses the amount they paid for the option. However, if the price of the underlying asset does exceed the strike price, then the call buyer makes a profit. The amount of profit is the difference between the market price and the option's strike price, multiplied by the incremental value of the underlying asset, minus the price paid for the option.

For example, a stock option is for 100 shares of the underlying stock. Assume a trader buys one call option contract on ABC stock with a strike price of $25. He pays $150 for the option. On the option's expiration date, ABC stock shares are selling for $35. The buyer/holder of the option exercises his right to purchase 100 shares of ABC at $25 a share (the option's strike price). He immediately sells the shares at the current market price of $35 per share.

He paid $2,500 for the 100 shares ($25 x 100) and sells the shares for $3,500 ($35 x 100). His profit from the option is $1,000 ($3,500 – $2,500), minus the $150 premium paid for the option. Thus, his net profit, excluding transaction costs, is $850 ($1,000 – $150). That's a very nice return on investment (ROI) for just a $150 investment.

Pay-Off pattern of Put Options

Puts give the buyer the right, but not the obligation, to sell the underlying asset at the strike price specified in the contract. The writer (seller) of the put option is obligated to buy the asset if the put buyer exercises their option. Investors buy puts when they believe the price of the underlying asset will decrease and sell puts if they believe it will increase.

A put option gives the buyer the right to sell the underlying asset at the option strike price. The profit the buyer makes on the option depends on how far below the spot price falls below the strike price. If the spot price is below the strike price, then the put buyer is "in-the-money." If the spot price remains higher than the strike price, the option will expire unexercised. The option buyer's loss is, again, limited to the premium paid for the option.

The writer of the put is "out-of-the-money" if the spot price of the underlying asset is below the strike price of the contract. Their loss is equal to the put option buyer's profit. If the spot price remains above the strike price of the contract, the option expires unexercised, and the writer pockets the option premium.

Figure 2 below shows the payoff for a hypothetical 3-month RBC put option, with an option premium of $10 and a strike price of $100. The buyer's potential loss (blue line) is limited to the cost of the put option contract ($10). The put option writer, or seller, is in-the-money as long as the price of the stock remains above $90.

Structure of Options Market

The options market is a critical component of the financial markets, providing investors with a platform to trade options contracts. Options are financial derivatives representing rights to buy (call options) or sell (put options) an underlying asset at a specified price (strike price) on or before a set date (expiration date). The structure of an options market, governed by certain players and several key determinants, has been discussed below.

Participants: The market includes buyers (option holders) and sellers (option writers or issuers). Buyers pay a premium to acquire options, while sellers receive premiums for creating them.

Types of Options: Call options grant the holder the right to buy the underlying asset; put options, on the other hand, grant the holder the right to sell it. However, in both cases, deal execution is not obligatory or binding on parties.

Underlying Assets: Options can be pegged or connected to a wide range of assets, including stocks, indexes, commodities, currencies, and interest rates.

Options Contracts: Each contract typically covers a specific quantity of the underlying asset (contract size). Contracts specify the strike price at which the asset can be bought or sold, and the

expiration date is also mentioned to facilitate trading. They may also specify the exercise style (e.g., American or European).

Exchanges: Organized exchanges, such as the Chicago Board Options Exchange (CBOE), provide a centralized marketplace for options trading. These exchanges establish standardized contract terms and facilitate trade execution.

Options Chains: Options chains display available options for a particular underlying asset, including the corresponding strike prices and expiration dates.

Market Participants' Objectives: Buyers of call options may seek capital appreciation in the underlying asset, while buyers of put options often use them for hedging or downside protection. Sellers aim to earn income from premiums.

Option Premium: The price of an option contract, known as the premium, is determined by factors like the underlying asset's price, volatility, time remaining until expiration, and interest rates.

Clearing and Settlement: Option contracts are cleared and settled through clearing houses, ensuring the obligations of each contract are met to reduce counterparty risk.

Option Strategies: Traders and investors use various option strategies, such as covered calls, protective puts, straddles, and spreads, to achieve specific financial goals.

Regulation: Options markets are regulated by financial regulators to maintain fairness and transparency in trading and promote investor protection.

Market Makers: Market makers, typically firms or individuals, facilitate options trading by providing liquidity. They quote bid and ask prices for options to maintain a liquid market.

Market Data: Real-time market data, including option prices, volumes, and open interest, is available for analysis and decision-making.

Risk Management: Participants in the options market employ risk management techniques to protect their portfolios from adverse price movements.

Option Pricing Models

Option Pricing Models are mathematical models that use certain variables to calculate the theoretical value of an option. The theoretical value of an option is an estimate of what an option should be worth using all known inputs. In other words, option pricing models provide us a fair value of an option. Knowing the estimate of the fair value of an option, finance professionals

could adjust their trading strategies and portfolios. Therefore, option pricing models are powerful tools for finance professionals involved in options trading.

Binomial Option Pricing Model

The simplest method to price the options is to use a binomial option pricing model. This model uses the assumption of perfectly efficient markets. Under this assumption, the model can price the option at each point of a specified time frame.

Under the binomial model, we consider that the price of the underlying asset will either go up or down in the period. Given the possible prices of the underlying asset and the strike price of an option, we can calculate the payoff of the option under these scenarios, then discount these payoffs and find the value of that option as of today.

Black-Scholes Model

The Black-Scholes model is another commonly used option pricing model. This model was discovered in 1973 by the economists Fischer Black and Myron Scholes. Both Black and Scholes received the Nobel Memorial Prize in economics for their discovery.

The Black-Scholes model was developed mainly for pricing European options on stocks. The model operates under certain assumptions regarding the distribution of the stock price and the economic environment. The assumptions about the stock price distribution include:

- Continuously compounded returns on the stock are normally distributed and independent over time.
- The volatility of continuously compounded returns is known and constant.
- Future dividends are known (as a dollar amount or as a fixed dividend yield).

The assumptions about the economic environment are:

- The risk-free rate is known and constant.
- There are no transaction costs or taxes.
- It is possible to short-sell with no cost and to borrow at the risk-free rate.

Nevertheless, these assumptions can be relaxed and adjusted for special circumstances if necessary. In addition, we could easily use this model to price options on assets other than stocks (currencies, futures).

The main variables used in the Black-Scholes model include:

- Price of underlying asset (S) is a current market price of the asset
- Strike price (K) is a price at which an option can be exercised

- Volatility (σ) is a measure of how much the security prices will move in the subsequent periods. Volatility is the trickiest input in the option pricing model as the historical volatility is not the most reliable input for this model
- Time until expiration (T) is the time between calculation and an option's exercise date
- Interest rate (r) is a risk-free interest rate
- Dividend yield (δ) was not originally the main input into the model. The original Black-Scholes model was developed for pricing options on non-paying dividends stocks.

Monte Carlo Simulation Model

Valuing options using Monte Carlo simulation is one of the most popular methods among traders and investors. However, understanding how Monte Carlo simulation works can be challenging for those who are not familiar with the concept. Monte Carlo simulation is a statistical method used to estimate the probability of an event occurring by running a large number of simulations, each with different sets of variables. The result of the simulation is an estimate of the probability of the event occurring. In the context of option pricing, Monte Carlo simulation is used to estimate the price of an option based on its underlying asset's future price movements.

1. Monte Carlo simulation in option pricing

Monte Carlo simulation is used in option pricing to estimate the price of an option based on the probability of different future price movements of the underlying asset. The simulation involves generating a large number of random price movements based on the asset's historical volatility and using them to calculate the option's price. The simulation creates a probability distribution of the asset's possible future prices. The distribution is then used to estimate the option's price.

2. Simulation inputs

The inputs required for a Monte Carlo simulation of option pricing include the current price of the asset, the strike price of the option, the time to expiration of the option, the risk-free interest rate, and the asset's historical volatility. The simulation generates random price movements based on the historical volatility input. The risk-free interest rate is used to discount the option's estimated future cash flows to their present value.

3. Advantages of Monte Carlo simulation

Monte Carlo simulation provides a flexible and customizable method of estimating the value of options. It can accommodate complex option structures and multiple underlying assets. The simulation can also incorporate changes in volatility and other market factors over time, making it a more accurate method of pricing options.

4. Limitations of Monte Carlo simulation

Monte Carlo simulation requires a significant amount of computing power and time to run. The simulation is also reliant on accurate inputs, particularly historical volatility data. Inaccurate inputs can lead to unreliable estimates of option prices.

Monte Carlo simulation is a statistical method widely used in option pricing. The simulation generates random price movements based on historical volatility to estimate the probability and price of an option. Monte Carlo simulation provides a flexible and customizable method of estimating the value of options while accommodating complex option structures and multiple underlying assets. However, it requires accurate inputs and significant computing power and time to run.

Unit-IV: Option Strategies

Strategies: Basic Strategies - Advanced Strategies - Trading with Options - Hedging with Options - Currency Options

Options trading is the buying and selling of options contracts in the market, usually on a public exchange. Options are often the next level of security that new investors learn about following their initial entry into the finance world. As derivatives, which are securities whose values are a function of a separate underlying security or index, options have another layer of complexity compared to a typical security. There are three critical factors when considering trading options versus trading a typical security:

- Pricing is multifactorial; deciding to trade in options means tracking several metrics that aren't present in trading other securities.
- Leverage is inherently present in options trading, so losses tend to be as magnified as gains.
- Trading long options positions is more short-term than long-term; you're looking for an event, and holding your investment typically means a loss of principal versus an eventual turnaround.

Option Basic Strategies:

Long Call Strategy

A long call strategy is likely the first approach that investors will take when dipping their toes into the options trading pool. An investor uses this strategy when they expect the price of the underlying security to increase in the future, so mainly for price speculation. More precisely, the price of that security needs to outpace the cost of the option premium on or before the expiration date. Let's go through an example:

- Assume Company A is currently trading at $10 a share. A call option for Company A grants 100 of its shares (a standard contract covers 100 shares) at a strike price of $10. The premium for this option is $1.00, so the total premium costs would be $100.
- The investor holds this option until the expiration date, at which point Company A is trading at $20. The investor exercises the right to buy 100 Company A shares at the strike price of $10 from the call writer, an outflow of $1,000. They then sell these shares at the current market price of $20, an inflow of $2,000.
- Ignoring transaction and opportunity costs, we can calculate the investor's profit as such: $2000 - $1000 - $100 = $900.

Long Put Strategy

A long put strategy is used when an investor is bearish on an asset (let's assume a stock), so they buy a put option to reflect this sentiment. Puts are also a common hedging instrument for investors holding long positions in the option's underlying security. For price speculation, a long put strategy is a less risky approach than short-selling since this play requires less leverage and your losses are limited to what you paid for the option contract. To profit, the underlying asset needs to drop below the cost of the premium on or before the expiration date. This would work as follows:

- Assume Company A is trading at $20 a share. A put option for Company A grants 100 of its shares at a strike price of $20. The premium for this option is $1.50, so the total premium costs would be $150 (note that put options tend to be pricier than call options, though not always).
- The investor holds this option until the expiration date, at which point Company A's share price has dropped to $10. The investor chooses to exercise their right to sell 100 Company A shares at the strike price of $20, an inflow of $2,000. The writer of the put option contract will then have to buy at this price of $2,000, even though the market price is $1,000 ($10 x 100). So in effect, the put investor is closing their position by buying Company A shares at $1,000, then selling those shares to the contract writer for $2,000.
- Ignoring transaction and opportunity costs, we can calculate the investor's profit as such: $2,000 - $1,000 - $150 (the premium price) = $850.

Advanced Option Trading Strategies:

Bull Call Spread

A *bull call spread* strategy is used by investors who have a bullish outlook on an underlying asset, but want to limit their downside at the cost of also capping their upside. This is done by simultaneously buying a call option and selling (i.e. writing) a call option. Both options should have the same expiration date, although the written call option should have a higher strike price. How an investor would profit with this strategy is best shown through a brief example:

- Assume Company A is trading at $11 a share. An investor is bullish so they buy a call option at a strike price of $10 for $150 and sell a call option at a strike price of $14 for $50. At this point, the investor has experienced an outlay of $100 ($150-$50).
- The investor's prediction pans out and Company A's share price rises to $15 at the time of expiration of both options. The intrinsic value of the

bought call option is now $500 and the intrinsic value of the sold call option is now $100. The spread's value is now at $400 ($500-$100).

- Factoring in the previous outlay of $100, the investor ends up with a profit of $300. If both calls would've expired out-of-the-money, then the investor would've only lost their initial $100 outlay.

Bear Put Spread Strategy

Investors run a *bear put spread* when they expect a lower value in a given security. Like a bull call spread, an investor would utilize this strategy to protect their initial investment by limiting its upside. To execute this, the investor buys a put option and sells a put option, both of which have the same expiration date. However, the sold put option would have a lower exercise price than the bought option. Let's walk through an example:

- Assume Company A is trading at $22 a share. An investor is bearish so they purchase a put option at a strike price of $19 for $200 and write a put option at a strike price of $16 for $50. The total outlay so far by the investor is $150.

- Company A's share price drops to $15 at the time of expiration for the options. The bought put's intrinsic value is now $400 and the sold put's intrinsic value is now $100, so the spread's value is now at $300 ($400-$100).

- Subtracting the initial outlay of $150 gives the investor a profit of $150. Had the options expired out-of-the-money, the investor would've instead lost $150.

Straddle Strategy

A *straddle strategy* differs from the previous strategies that we discussed in that both a call and a put are required. This strategy is used by investors that expect volatility in the underlying asset, but don't want to predict which direction the price will go. In this article, we'll focus on long straddles rather than short straddles (we'll also look at long strangles in the next section). A long straddle is performed by buying a call and put for the same underlying asset that have matching strike prices and expiration dates. These options are also bought at-the-money. Upside potential is unlimited while the possible downside is limited to the initial cost of the options. This may sound good, but investors should understand that you'll usually need to at least predict moderate volatility to get the needed price movement for a profit. Let's look at an example:

- Assume Company A is trading at $20 a share. An investor deploys a long straddle position by buying a put at a strike price of $20 for $100 and a buying a call at a strike price of $20 for $100. The total outlay here is $200, which is also the most that the investor can lose.

- The company experiences a downswing in its price after earnings, leaving it trading at $15 a share. The call option in the straddle would be allowed to expire (since it is out-of-the-money) but the put option would be exercised since its intrinsic value would be $500.

- After factoring in the initial outlay of $200, the investor's profit in this trade is $300.

Strangle Strategy

Applying a *long strangle* strategy is similar to a long straddle play in that a call option and a put option are involved, both purchased at the same expiration date. However, they need to be out-of-the-money as opposed to at-the-money like in a straddle, and they don't need to be the same strike price. Otherwise, the potential payoff and possible risk share similar profiles to straddles, although the underlying assets price movement needs to be much more pronounced. Here's a hypothetical setup:

- Assume Company A is trading at $30 a share. The strangle position is set up by an investor through the purchase of a call with a strike price of $35 for $200 and the purchase of a put with a strike price of $25 for $200. The investor would spend $400 in total here and this is their maximum potential loss.

- As the options reach their expiration, Company A's share price is $40. Therefore, the put option component of this strangle would expire worthless but the call option would have an intrinsic value of $500.

- Subtracting the initial $400 outlay leaves the investor with a profit of $100 from this strategy.

Hedging with Options:

While the use of short and long hedges can reduce (or eliminate in some cases

- as below) both downside and upside risk. The reduction of upside risk is certainty a limitation of using futures to hedge.

1.1 Short Hedges

A short hedge is one where a short position is taken on a futures contract. It is typically appropriate for a hedger to use when an asset is expected to be sold in the future. Alternatively, it can be used by a speculator who anticipates that the price of a contract will decrease.

1. For example, assume a cattle rancher plans to sell a pen of feeder cattle in March based on the spot prices at that time. The rancher can hedge in the following manner. Currently,

- A March futures contract is purchases for a price of $150

- For simplicity, assume the rancher anticipates (and does sell) selling 50,000 pounds (1 contract)

- Spot prices are currently $155

- What happens when the spot price is March decreases to $140?

– Rancher loses $10 per 100 pounds on the sale from the decreased price

– Rancher gains $10 by selling the futures contract for $150 and immediately buying (to close out) for $140

– Effective price of the sale is $150

- What happens when the spot price is March increases to $160?

– Rancher gains $10 per 100 pounds on the sale from the increased price

– Rancher loses $10 by buying the futures contract for $150 and immediately selling (to close out) for $160

– Effective price of the sale is $150

- The seller has effectively locked in on the price prior to the sale by offsetting gains/losses

2. Now assume the same for a speculator who takes a short position on a March futures contract at $150

- If the price falls to $140, the speculator sells for $150 and immediately buys for $140, leading to a gain of $10 per 100 pounds [$5,000 gain in value for one contract]

- If the price increases to $160, the speculator loses $5,000

Long Hedges

A long hedge is one where a long position is taken on a futures contract. It is typically appropriate for a hedger to use when an asset is expected to be bought in the future. Alternatively, it can be used by a speculator who anticipates that the price of a contract will increase.

1. For example, assume an oil producer plans on purchasing 2,000 barrels of crude oil in August for a price equal to the spot price at the time. The producer can hedge in the following manner by using crude oil futures from the NYMEX. Currently,

- An August oil futures contract is purchases for a price of $59 per barrel
- Spot prices are currently $60
- What happens when the spot price in August decreases to $55?

– Producer gains $4 per barrel on the purchase from the decreased price

– Producer loses $4 by buying the futures contract for $59 and immediately selling (to close out) for $55

– Effective price of the sale is $59

- What happens when the spot price in August increases to $65?

– Producer loses $6 per barrel on the purchase from the increased price

– Producer gains $6 by selling the futures contract for $59 and immediately buying (to close out) for $65

– Effective price of the sale is $59

- The producer has effectively locked in on the price prior to the sale by offsetting gains/losses

2. Now assume the same for a speculator who takes a long position on a March futures contract at $59

- If the price increases to $65, the speculator sells for $59 and immediately buys for $65, leading to a gain of $6 per barrel [$12,000 gain in value for five contracts]
- If the price increases to $55, the speculator loses $12,000

Basis Risk

In practice, hedges are often not as straightforward as has been assumed in this course due to the following reasons

1. The asset to be hedged might not be exactly the same as the asset under- lying the futures contract

- actual commodity, weight, quality, or amount might differ

2. The hedger might not be exactly certain of the when the asset will be bought or sold

3. Futures contract might need to be closed out before its delivery month

- many commodities do not have 12 delivery months

Basis is the difference between the cash price for the asset to be hedged and the futures price. If the hedged asset is identical to the commodity underlying the futures contract, the cash price and futures price should converge as delivery nears. Changes in basis price do not impact the futures contract but do impact the sales price for the produced to be hedged.

- Basis prices have strong seasonal patterns

- Basis prices are not known and provide an additional layer of risk above and beyond price in the futures market

- Basis risk is often be hedged through the use of forward contracts

- Basis volatility is relatively small compared to price volatility

Cross-Hedging

In the case when an asset is looking to be hedged and there is not an exact replication in the futures/options market, cross hedging can be employed.

For example, if an airline is concerned with hedging against the price of jef fuel, but jet fuel futures are not actively traded, they might consider the use of heating oil futures contracts.

- Hedge ratio - The ratio of the size of a position in a hedging instrument to the size of the position being hedged.

– When an asset to be hedged is exactly the same as the asset under- lying the futures contract, the hedge ratio is equal to 1.0

– The existence of basis risk often prevents this from happening

– It is not always optimal to cross hedge (not is it usually possible) to hedge such that the hedge ratio equals 1.0

- Minimum Variance Hedge ratio - The hedge ratio where the variance of the value of the hedged position is minimized.

SWAP: Concept - Nature - Features - Evolution of Swap Market.
Major Types of Swaps: Interest Rate Swaps - Currency Swaps - Commodity Swaps - EquityIndex Swaps - Credit Risk in Swaps - Credit Swaps.
Managing Risk: Using Swaps to Manage Risk - Pricing and Valuing Swaps.

SWAP- Meaning & Definition

A swap is a derivative contract through which two parties exchange the cash flows or liabilities from two different financial instruments. Most swaps involve cash flows based on a notional principal amount related to a loan or bond, although the security can be almost anything. Usually, the principal does not change hands. Each cash flow comprises one leg of the swap. One cash flow is generally fixed, while the other is variable and based on a benchmark interest rate, floating currency exchange rate, or index price.

Nature and Features of SWAPs:

One of their unique features is their ability to be customised to meet the specific needs of the contracting parties. This flexibility is what makes a swap derivative a versatile tool in risk management and financial strategy. Types of swaps derivatives include interest rate, currency, commodity, credit default, and equity swaps, each designed to cater to different financial exposures and strategies.

History

Swaps were first introduced to the public in 1981 when IBM and the World Bank entered into a swap agreement. Today, swaps are among the most heavily traded financial contracts in the world: the total amount of interest rates and currency swaps outstanding was more than $348 trillion in 2010, according to Bank for International Settlements.

Most swaps are traded over-the-counter (OTC), "tailor-made" for the counterparties. The Dodd-Frank Act in 2010, however, envisions a multilateral platform for swap quoting, the swaps execution facility (SEF), and mandates that swaps be reported to and cleared through exchanges or clearing houses which subsequently led to the formation of swap data repositories (SDRs), a central facility for swap data reporting and recordkeeping. Data vendors, such as Bloomberg, and big exchanges, such as the Chicago Mercantile Exchange, the largest U.S. futures market, and the Chicago Board Options Exchange, registered to become SDRs. They started to list some types of swaps, swaptions and swap futures on their platforms. Other exchanges followed, such as the Intercontinental Exchange and Frankfurt-based Eurex AG.

According to the 2018 SEF Market Share Statistics Bloomberg dominates the credit rate market with 80% share, TP dominates the FX dealer to dealer market (46% share), Reuters dominates the FX dealer to client market (50% share), Tradeweb is strongest in the vanilla interest rate market (38% share), TP the biggest platform in the basis swap market (53% share), BGC dominates both the swaption and XCS markets, Tradition is the biggest platform for Caps and Floors (55% share).

Types Of Swaps Derivatives

1. Interest Rate Swaps

Interest rate swaps are powerful financial instruments that effectively mitigate financial risk and optimise business cash flow. By entering into an interest rate swap agreement, two parties agree to exchange cash flows based on a predetermined interest rate, typically tied to a benchmark.

This allows businesses to hedge against fluctuations in interest rates, thereby reducing their exposure to interest rate risk. Moreover, interest rate swaps allow companies to optimise cash flow by converting variable-rate debt into fixed-rate debt or vice versa, depending on their specific needs and market conditions.

This flexibility can help businesses manage their interest rate expenses more efficiently and improve their overall financial stability.

Classification of Interest Rate Swaps Based on Purpose

The classification of Interest Rate Swaps can indeed vary based on the purpose for which they're utilised. To simplify this, you can think of it like this: differing kinds of Interest Rate Swaps are used as effective tools for different types of financial **risk management**. They function as a means to hedge against interest rate exposure, speculate on future market movements, or achieve more favourable borrowing conditions.

Common types of Interest Rate Swaps based on purposive classification include:

- **Hedging Swaps:** These are used by companies to mitigate the risk of interest rate fluctuation. This is most often the case when a company has a loan with a variable interest rate, and cannot budget future payments accurately due to rate uncertainty.
- **Speculative Swaps:** Here, companies or individuals take a position based on their expectations for future interest rate movements. If correctly predicted, the party can make a significant profit.
- **Operational Swaps:** This type of swap aims to overcome regulatory or policy-related obstacles. For example, if a company is restricted from taking loans in a foreign currency, it can take a loan in local currency and use a cross-currency swap to change the interest payments to the foreign currency rate.

Interest Rate Swaps Example: Fixed-to-Floating

In this type of swap, one party swaps its future fixed interest payments with another party's future floating interest payments. The party paying the fixed rate is essentially the buyer of the swap, while the party receiving the fixed rate payment and paying the floating rate is the seller.

Take as an example two parties, Alpha and Beta. Alpha has obtained a loan with a fixed interest of 5% per annum. On the contrary, Beta has a loan of the same principal amount but with a floating interest rate (rate changes with the market), say LIBOR + 1%. If Alpha presumes that the interest rates will decrease in the future and Beta believes the opposite, they could consider entering an agreement for an Interest Rate Swap.

In this scenario, Alpha becomes the payer of the floating rate to Beta, while Beta pays Alpha the 5% fixed interest rate. Both parties will be paying the same amount if LIBOR happens to be 4%. If LIBOR stays below 4%, Alpha benefits, while if LIBOR exceeds 4%, Beta benefits.

Interest Rate Swaps Example: Floating-to-Fixed

Here, the party that was initially making floating interest rate payments will swap to make fixed payments, and vice versa. This kind of swap can be beneficial for entities or individuals who have taken a floating interest rate loan but foresee that the interest rates will increase. By entering into a Floating-

to-Fixed swap, they can lock in a fixed interest rate that would be lower than the expected increased floating interest rates.

Let's consider the same example of Alpha and Beta, but now Beta, who initially had a floating interest rate loan, believes the market rates will skyrocket in the future, and therefore, it would be more beneficial to lock in a fixed rate. The swap occurs, and now Beta will pay the 5% fixed rate to Alpha and receive the floating interest payments from Alpha in return. If market interest rates stay beneath 5%, Alpha profits whereas if they soar above 5%, Beta gains from the swap.

2. Currency Swaps

In a currency swap, two parties agree to exchange principal amounts in different currencies and the interest payments associated with those currencies over a specified period.

This enables businesses to manage their exposure to fluctuations in exchange rates, which can significantly impact their international transactions and profitability. By entering into a currency swap, companies can effectively lock in a predetermined exchange rate, providing greater certainty and stability in their foreign currency transactions.

Additionally, currency swaps can help minimise transaction costs by avoiding the need for frequent currency conversions and reducing reliance on foreign exchange markets. So, it provides businesses with a valuable tool to mitigate foreign exchange risk and optimise their international operations.

Types of Currency Swaps

Currency swaps come in various types, each tailored to meet specific needs and objectives. Following are the main types of currency swaps:

- **Fixed-for-Fixed Currency Swap:** Both parties exchange interest payments and principal in different currencies at fixed interest rates. This is the most straightforward type of currency swap, ideal for hedging against currency and interest rate risks.
- **Fixed-for-Floating Currency Swap:** One party pays a fixed interest rate on a specified currency, while the other pays a floating interest rate on another currency. This type is useful for companies looking to hedge against or speculate on interest rate movements.
- **Floating-for-Floating Currency Swap (Basis Swap):** Both parties exchange interest payments in different currencies, but both are floating rates. This swap is often used when both parties seek to benefit from differing expectations of future interest rate movements in their respective currencies.
- **Principal Only Swap:** Involves only the exchange of the principal amounts in two different currencies at the beginning and end of the agreement, without any exchange of interest payments. This can be useful for companies needing to convert a loan in one currency to another currency for a specific period.
- **Interest Only Swap:** Only interest payments are exchanged in different currencies according to the agreed terms, without any exchange of the principal amounts. This type can be advantageous for managing cash flows and hedging against interest rate fluctuations.
- **Amortizing Swap:** The principal amount decreases over time according to a predetermined schedule. This swap is suitable for companies with loans that are being paid down over time, as it can help match their debt repayment schedules.
- **Accreting Swap:** Opposite of an amortizing swap, the principal amount increases over time. This can be useful for projects with increasing financing needs over time.

- **Cross-Currency Interest Rate Swap:** It is a combination of interest rate swap and currency swap, where one party swaps the interest payments and principal in one currency (either fixed or floating) for payments in another currency (either fixed or floating). It's utilized f or obtaining better loan rates and hedging against both interest rate and currency risks.

How Does Currency Swap Work?

During a currency swap, parties agree in advance whether they will or will not exchange the principal amounts of two currencies at the beginning of a transaction. The exchange rate depends on the two principal amounts. During maturity, the same principal amounts must be exchanged.

Working of Currency Swaps Contract With an Example

Let us take a look at an example to illustrate how currency swaps work:

Situation:

Company A is based in the United States and wants to borrow euros.

Company B is based in Europe and wants to borrow U.S. dollars.

Both companies find that they can get better interest rates by borrowing in their home currencies than in foreign currencies directly.

Step 1: Initial Exchange

Company A and Company B agree to a currency swap.

Company A borrows an agreed amount in U.S. dollars at the prevailing interest rate in the U.S., say $10 million at 3% annual interest.

Company B borrows the equivalent amount in euros at the prevailing interest rate in Europe, say €9 million at 2% annual interest.

They then swaps the principal amounts, meaning Company A receives €9 million, and Company B receives $10 million.

Step 2: Interest Payments

Throughout the term of the swap, Company A will pay the interest on the €9 million at 2% to Company B, even though the money was originally borrowed in dollars.

Similarly, Company B will pay the interest on the $10 million at 3% to Company A.

These payments are usually netted against each other to simplify the transaction.

Step 3: Principal Exchange

At the end of the swaps agreement, which could be several years later, the principal amounts are swapped back at the same exchange rate as the initial transaction, regardless of any fluctuations in the currency rates in the meantime.

This means Company A returns €9 million to Company B, and Company B returns $10 million to Company A.

Benefits:

Company A gets access to euros at a cheaper interest rate than if it borrowed directly in the euro market.

Company B gets access to dollars at a cheaper interest rate than if it borrowed directly in the U.S. market.

Both companies benefit from the certainty of knowing their future cash flows in terms of foreign currency payments and receipts, which helps in hedging against currency risk.

Currency swaps offer several benefits for companies and financial institutions, including:

Access to Better Rates: Companies can borrow at more favourable interest rates in their home currency and swaps to obtain foreign currencies, potentially saving on interest costs.

Hedge Against Currency Risk: Currency swaps provide a hedge against exchange rate fluctuations by locking in exchange rates for the repayment of principal and interest payments.

Improved Loan Access: They enable access to foreign capital markets that may otherwise be inaccessible due to regulatory barriers or high borrowing costs.

Flexibility in Financing: Companies can tailor the terms of currency swaps to meet their specific financial needs, including the amount, term, and interest rate structure.

Balance Sheet Management: Swaps can be used to manage and optimize the currency composition of a company's balance sheet, reducing foreign exchange exposure.

Cost Efficiency: By netting out interest payments, companies can reduce transaction costs associated with currency exchanges and interest payments.

Liquidity Management: They help companies manage liquidity by providing access to additional funding sources in different currencies.

Strategic Expansion Support: Currency swaps can support companies' international expansion strategies by providing a mechanism to finance investments in foreign countries efficiently.

Currency swaps have the following disadvantages:

Complexity: They can be complicated to structure and understand, requiring specialized knowledge.

Credit Risk: Risk that the other party might not fulfill their payment obligations.

Market Risk: Exposure to the fluctuation in interest rates and currency values that can affect costs.

Liquidity Risk: Difficulty in finding a counterparty or exiting the swaps can pose challenges.

Operational Costs: Involves legal, consulting, and monitoring expenses, increasing the overall cost.

Regulatory Risk: Subject to varying regulations that can change, potentially affecting the swap's viability.

Opportunity Cost: Locking in rates may result in missed opportunities if market conditions improve.

Settlement Risk: Risk at the end of the swap, especially if there's a significant movement in exchange rates.

3. Credit Default Swaps

Credit Default Swaps (CDS) are a type of swaps derivative that investors can use to protect against credit defaults and diversify their investment portfolio.

A Credit Default Swap is a contract between two parties, where one party agrees to pay the other party a regular premium in exchange for protection against a credit event, such as a default or bankruptcy, of a specific reference entity, such as a company or government. In the event of a credit default, the protection buyer receives a payout from the protection seller, which can help offset the losses incurred from the default.

This allows investors to mitigate the risk of holding bonds or other debt instruments by transferring the credit risk to another party. Credit Default Swaps can also be used for speculative purposes, allowing investors to profit from changes in the creditworthiness of a reference entity without actually owning the underlying debt.

4. Commodity Swaps

Commodity Swaps are a valuable financial tool enabling businesses to manage commodity price risk effectively while ensuring long-term supply agreements.

Unlike other types of swaps derivatives, Commodity Swaps allow companies to hedge against fluctuations in the prices of essential commodities like oil, natural gas, or agricultural products. By entering into a Commodity Swap, businesses can fix the price at which they will buy or sell a specific commodity in the future, providing stability and predictability in their supply chain.

This allows companies to protect themselves from volatile price movements and secure a consistent supply of crucial raw materials or energy resources.

Commodity Swaps provides a flexible and customisable approach to risk management, enabling businesses to tailor the terms and duration of the swap to meet their specific needs. With the ability to lock in prices and establish long-term agreements, companies can focus on their core operations confidently, knowing that their commodity price exposure is effectively managed.

Fixed-Floating Commodity Swaps

Fixed-floating swaps are very similar to interest rate swaps. The difference is that commodity swaps are based on the underlying commodity price rather than on a floating interest rate. In this type of swap contract, there are two legs, the floating-leg, which is tied to the market price of the commodity, and the fixed-leg, which is the agreed-upon price specified in the contract.

The party looking to hedge their position will enter into the swap contract with a swap dealer to pay a fixed price for a certain quantity of the underlying commodity on a periodic basis. The swap dealer will, in turn, agree to pay the party the market price of the commodity. These cash flows will net out each period, and the party who must pay more will pay the difference.

On the other side, the swap dealer will also find a party looking to pay the floating price of the commodity. The swap dealer will enter into a contract with this party to accept the floating market price and pay the fixed price, which will again net out. Swap dealers such as financial service companies play the role of a market maker and profit from the bid-ask spread of these transactions.

Commodity-For-Interest Swaps

A commodity-for-interest swap is very similar to an equity swap, however, the underlying asset is a commodity. One leg will pay a return based on the commodity price while the other leg is tied to a floating interest rate such as LIBOR, or an agreed-upon fixed rate. The swap involves a notional principal or face value, specified duration, and pre-specified payment periods.

Like the fixed-floating swap, the periodic payments will net out against each other and the party who must pay more based on the commodity return, interest rate, and face value will pay the difference.

Fixed-Floating Commodity Swaps

Fixed-floating swaps are very similar to interest rate swaps. The difference is that commodity swaps are based on the underlying commodity price rather than on a floating interest rate. In this type of swap contract, there are two legs, the floating-leg, which is tied to the market price of the commodity, and the fixed-leg, which is the agreed-upon price specified in the contract.

The party looking to hedge their position will enter into the swap contract with a swap dealer to pay a fixed price for a certain quantity of the underlying commodity on a periodic basis. The swap dealer will, in turn, agree to pay the party the market price of the commodity. These cash flows will net out each period, and the party who must pay more will pay the difference.

On the other side, the swap dealer will also find a party looking to pay the floating price of the commodity. The swap dealer will enter into a contract with this party to accept the floating market price and pay the fixed price, which will again net out.

Swap dealers such as financial service companies play the role of a market maker and profit from the bid-ask spread of these transactions.

5. Equity Swaps

Equity Swaps offer investors a unique opportunity to gain exposure to the stock market without actually owning the underlying assets. This derivative instrument allows parties to exchange a stock's returns or a stock index for a predetermined period.

By entering into an equity swap, investors can benefit from the price movements of the referenced stocks or indexes without purchasing them directly. This can be particularly advantageous for investors looking to diversify their portfolios or speculate on the performance of specific stocks or market indices.

Equity swaps provide flexibility in terms of the duration and terms of the agreement, allowing investors to tailor their exposure to suit their investment objectives and risk tolerance.

Types

Thus, type of **equity swaps trading** can be in various forms. Let us try to understand them in detail.

- **Total return swap** – One party under this contract will get a total return in the form of capital gain or interest of dividend on the equity index, which is the underlying asset and will pay the other party in a fixed or floating rate.

- **Price return swap** – In this, the parties to the contract exchange the **capital appreciation** or depreciation of the index or equity. The settlement of the swap contract is done based on changes in the price of stock, excluding the dividend.
- **Dividend swap** – This is based only on dividends given out by the stock, which is the underlying asset. One of the parties agrees to take or pay this dividend that is used for income generation or hedging.
- **Fixed interest rate** – In this, one party agrees to pay a fixed interest rate and in exchange, gets a return on the equity.
- **Floating interest rate** – In this kind of contract, one party pays to the other on the basis of a floating interest rate and receives the returns on equity.