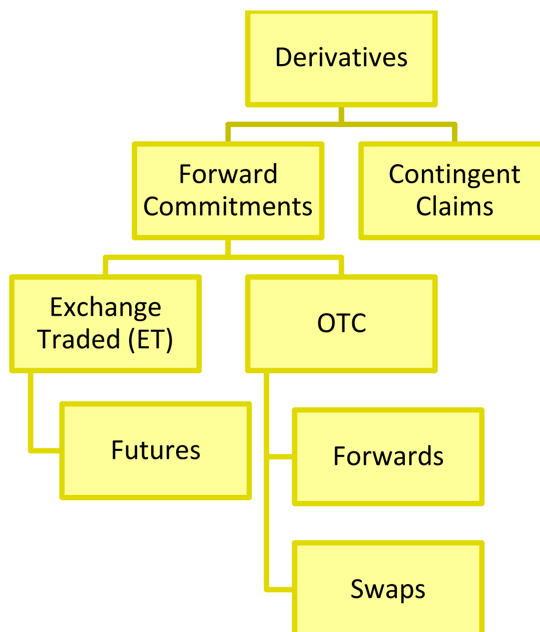
Study unit 1: Derivative markets and instruments



Key Concepts

Derivatives:

- A financial instrument that offers a return based on the return of some other underlying asset.
- The financial markets have created their own way of offering insurance against financial loss in the form of contracts called **derivatives**.
- In this sense, its return is ***derived*** from another instrument.

Underlying:

- An asset that trades in a market in which buyers and sellers meet, decide on a price, and the seller then delivers the asset to the buyer and receives payment. The underlying is the asset or other derivative on which a particular derivative is based.
- This underlying asset is often referred to simply as the **underlying**
- The market for the underlying is also referred to as the spot market.

Spot Price (S_0):

- The price for immediate purchase of the underlying asset is called the **cash price** or **spot price**

Derivative Contract:

- A derivative has a defined and limited life
- Initiates on a certain date and terminates on a later date.
- Is an agreement between two parties in which each does something for the other.

Forward Commitments:

- Contracts in which the two parties enter into an agreement to engage in a transaction at a later date at a price established at the start
- Two major classifications exist: exchanged-traded contracts, specifically futures, and over-the-counter contracts, which consist of forward contracts and swaps.
- Firm and binding agreements to engage in a transaction at a future date
- They obligate each party to complete the transaction, or alternatively, to offset the transaction by engaging in another transaction that settles each party's financial obligation to the other

Forward Contract:

- An agreement between two parties in which one party, the buyer, agrees to buy from the other party, the seller, an underlying asset at a later date for a price established at the start of the contract.
- The parties to the transaction specify the forward contract's terms and conditions - the contract is said to be ***customized***
- Each party is subject to the possibility that the other party will default.
- Take place in a large and private market consisting of banks, investment banking firms, governments, and corporations.
- These contracts call for the purchase and sale of an underlying asset at a later date.
- The underlying asset could be a security (i.e., a stock or bond), a foreign currency, a commodity, or combinations thereof, or sometimes an interest rate. In the case of an interest rate, the contract is not on a bond from which the interest rate is derived but rather on the interest rate itself.
- Other common forward contracts include commitments to buy and sell a foreign currency or a commodity at a future date, locking in the exchange rate or commodity price at the start.
- The forward market is a private and largely unregulated market.
- The parties want to keep them private and want little government interference to simply reflect a desire to maintain a prudent level of business secrecy

Futures Contract:

- A variation of a forward contract that has essentially the same basic definition but with some additional features, such as a clearinghouse guarantee against credit losses, a daily settlement of gains and losses, and an organized electronic or floor trading facility.
- Not a private and customized transaction. Instead, it is a public, standardized transaction that takes place on a futures exchange
- The contracts are standardized, which means that the exchange determines the expiration dates, the underlying, how many units of the underlying are included in one contract, and various other terms and conditions.
- The futures exchange guarantees to each party that if the other fails to pay, the exchange will pay. In fact, the exchange actually writes itself into the middle of the contract so that each party effectively has a contract with the exchange and not with the other party. The exchange collects payment from one party and disburses payment to the other.

Swap:

- An agreement between two parties to exchange a series of future cash flows.
- Typically at least one of the two series of cash flows is determined by a later outcome. In other words, one party agrees to pay the other a series of cash flows whose value will be determined by the unknown future course of some underlying factor, such as an interest rate, exchange rate, stock price, or commodity price. The other party promises to make a series of payments that could also be determined by a second unknown factor or, alternatively, could be preset. We commonly refer to swap payments as being "fixed" or "floating" (sometimes "variable").
- Private transactions and thus not subject to direct regulation
- Arguably the most successful of all derivative transactions

Contingent claims:

- Derivatives in which the payoffs occur if a specific event occurs; generally referred to as options

Option:

- A financial instrument that gives one party the right, but not the obligation, to buy or sell an underlying asset from or to another party at a fixed price over a specific period of time
- An option that gives the right to buy is referred to as a call.
- An option that gives the right to sell is referred to as a put.
- The fixed price at which the underlying can be bought or sold is called the exercise price, strike price, striking price, or strike, and is determined at the outset of the transaction. In this book, we refer to it as the exercise price, and the action of buying or selling the underlying at the exercise price is called exercising the option. The holder of the option has the right to exercise it and will do so if conditions are advantageous; otherwise, the option will expire unexercised.
- Thus, the payoff of the option is contingent on an event taking place, so options are sometimes referred to as contingent claims.
- The buyer and seller of an option can arrange their own terms and create an option contract. Alternatively, the buyer and seller can meet directly, or through their brokers, on an options exchange and trade standardized options.
- Because the option buyer is not obligated to do anything beyond paying the original price, the seller of any type of option is not subject to the buyer defaulting. In the case of a standardized option, the buyer does not face the risk of the seller defaulting. The exchange, through its clearinghouse, guarantees the seller's performance to the buyer.

Exchange Traded:

- Exchange-traded derivatives are created, authorized, and traded on a derivatives exchange, an organized facility for trading derivatives.
- Exchange-traded derivatives are standardized instruments with respect to certain terms and conditions of the contract.
- They trade in accordance with rules and specifications prescribed by the derivatives exchange and are usually subject to governmental regulation.
- Exchange-traded derivatives are guaranteed by the exchange against loss resulting from the default of one of the parties.

OTC:

- Over-the-counter derivatives are transactions created by any two parties off of a derivatives exchange. The parties set all of their own terms and conditions, and each assumes the credit risk of the other party.

Derivative Dealers:

- The commercial and investment banks that make markets in derivatives. Also referred to as market makers.

Price Discovery:

- A feature of futures markets in which futures prices provide valuable information about the price of the underlying asset.
- One of the primary functions of futures markets

Futures markets

- Provide valuable information about the prices of the underlying assets on which futures contracts are based, They provide this information in two ways
- First, many of these assets are traded in geographically dispersed markets, With geographically dispersed markets, many different spot prices could exist. In the futures markets, the price of the contract with the shortest time to expiration often serves as a proxy for the price of the underlying asset
- Second, the prices of all futures contracts serve as prices that can be accepted by those who trade contracts in lieu of facing the risk of uncertain future prices
- For example, a company that mines gold can hedge by selling a futures contract on gold expiring in two months, which locks in the price of gold two months later. In this manner, the two-month futures price substitutes for the uncertainty of the price of gold over the next two months.

Risk Management:

- The process of identifying the level of risk an entity wants, measuring the level of risk the entity currently has, taking actions that bring the actual level of risk to the desired level of risk, and monitoring the new actual level of risk so that it continues to be aligned with the desired level of risk.
- Often this process is described as hedging, which generally refers to the reduction, and in some cases the elimination, of risk.
- On the other side is the process called speculation. Traditional discussions of derivatives refer to hedging and speculation as complementary activities
- In general, hedgers seek to eliminate risk and need speculators to assume risk.

Arbitrage:

- The condition in a financial market in which equivalent assets or combinations of assets sell for two different prices, creating an opportunity to profit at no risk with no commitment of money. In a well functioning financial market, few arbitrage opportunities are possible. Equivalent to the ***law of one price.***

Summary

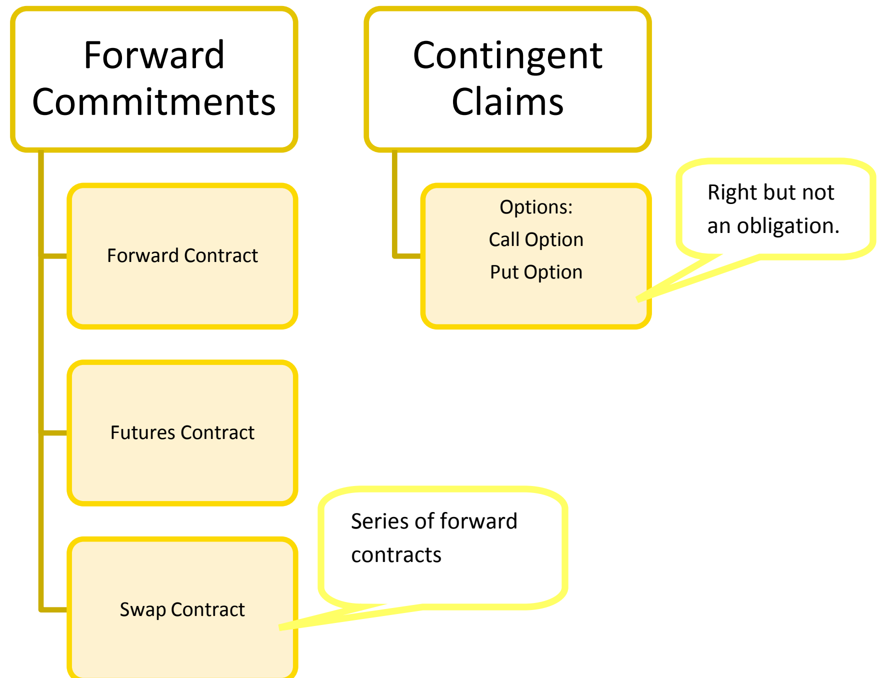
- The inherent danger in utilising derivatives (leveraged instruments) is their capacity to not only reduce risk but also create risk owing to an enhanced uncovered exposure.
- Ultimately, the primary purpose of derivative instruments remains the protection of an existing exposure, either by containing any potential upside or downside (**hedge**), retaining the upside while limiting the downside (**insurance**) or aligning the exposure to future expectations or needs (**transforming** assets or liabilities).
- Forward and futures contracts are used for hedging, options for insurance and swaps to transform assets or liabilities.

Key Points (Textbook)

- A derivative contract is a financial instrument with a return that is obtained from or "derived" from the return of another underlying financial instrument.
- Exchange-traded derivatives are created, authorized, and traded on a derivatives exchange, an organized facility for trading derivatives. Exchange-traded derivatives are standardized instruments with respect to certain terms and conditions of the contract. They trade in accordance with rules and specifications prescribed by the derivatives exchange and are usually subject to governmental regulation. Exchange-traded derivatives are guaranteed by the exchange against loss resulting from the default of one of the parties.
- Over-the-counter derivatives are transactions created by any two parties off of a derivatives exchange. The parties set all of their own terms and conditions, and each assumes the credit risk of the other party.
- A forward commitment is an agreement between two parties in which one party agrees to buy and the other agrees to sell an asset at a future date at a price agreed on today. The three types of forward commitments are forward contracts, futures contracts, and swaps.
- A forward contract is a forward commitment created in the over-the-counter market. A futures contract is a forward commitment created and traded on a futures exchange. A swap is an over-the-counter transaction consisting of a series of forward commitments.
- A contingent claim is a derivative contract with a payoff dependent on the occurrence of a future event. The primary types of contingent claims are options, but other types involve variations of options, often combined with other financial instruments or derivatives.
- An option is a derivative contract giving one party the right to buy or sell an underlying asset at a fixed price over a period of time or at a specific point in time. The party obtaining the right pays a premium (the option price) at the start and receives the right to buy or sell, as prescribed by the contract. The two types of options are a call (the right to buy) and a put (the right to sell).
- The size of the global derivatives market can be measured by notional principal, which is the amount of the underlying on which a derivative is based, and by market value, which is the economic worth of the derivative.
- Derivative markets serve many useful purposes such as providing price discovery, facilitating risk management, making markets more efficient, and lowering transaction costs. Derivatives are often criticized as being excessively dangerous for unknowledgeable investors and have been inappropriately likened to gambling.
- Arbitrage is a process through which an investor can buy an asset or combination of assets at one price and concurrently sell at a higher price, thereby earning a profit without investing any money or being exposed to any risk. The combined actions of many investors engaging in arbitrage results in rapid price adjustments that eliminate these opportunities, thereby bringing prices back in line and making markets more efficient.

Lecturer's Notes

- **Definition of a derivative:** Financial instrument that derives its value from the price of an underlying asset.
- **Immediate price of a derivative:** The spot price S_0 or cash price.
- With a forward contract no premium is paid at inception, however with a contingent claim a premium is paid at inception.
- **Types of Derivatives:**



- **Derivatives Characteristics**

Forward Contract	Futures Contract
OTC	Exchange Traded
Default Risk	Clearinghouse limits risk
Custom Contract	Standardized Contract
Unregulated	Regulated
Less Liquid	More Liquid