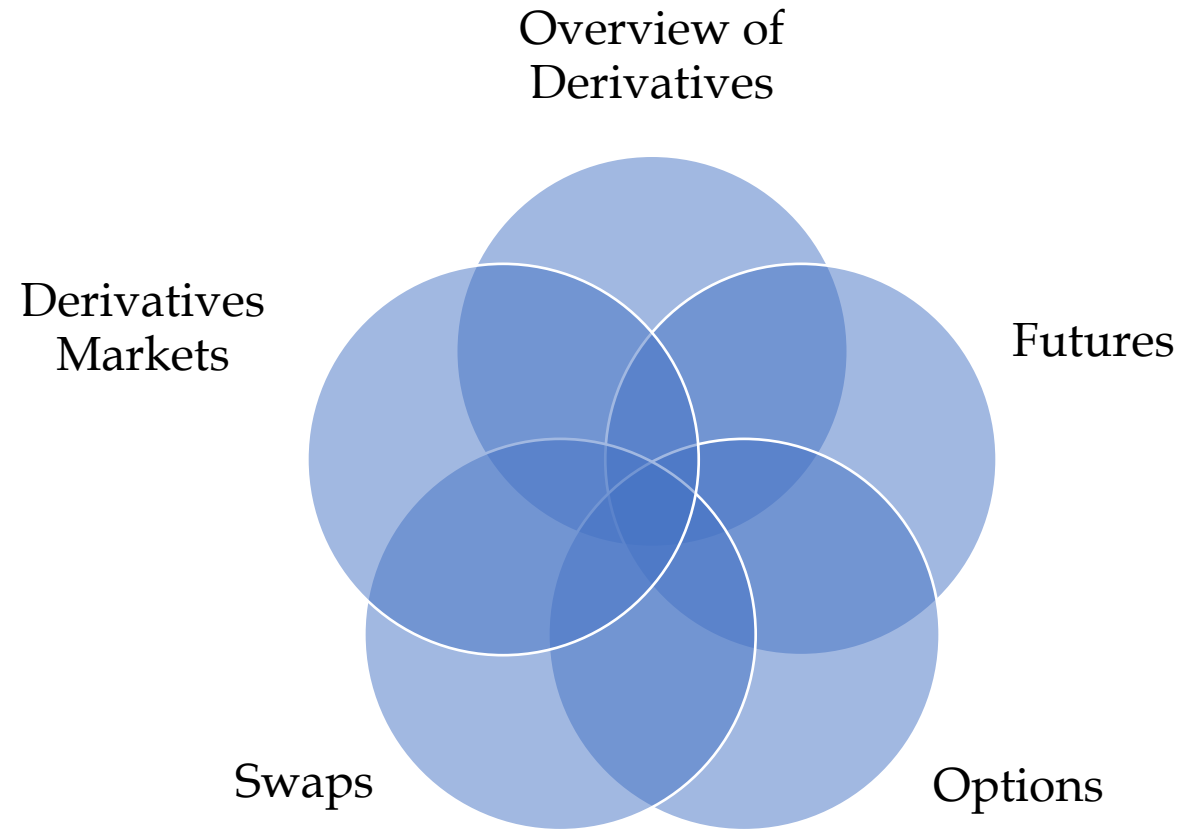


Chapter 6 – Derivatives

6 Questions





Definition and Overview

A **derivative** is a financial instrument whose price is based on the price of another asset, known as the 'underlying'.

The underlying could be a financial asset, a commodity, a currency or an index. Financial assets include:

- bonds and shares
- commodities such as oil, gold, silver, corn and wheat.

Their **origins** can be traced back to agricultural markets, where farmers needed a mechanism to guard against price fluctuations caused by gluts of produce and merchants wanted to guard against shortages that might arise from periods of drought.

Exchange Traded

OTC



Use of Derivatives

- Derivatives play a major role in the investment management. Main uses:
- **Hedging** - Used to reduce portfolio risk, such as the impact of adverse price movements on a portfolio's value. This could be achieved by buying or selling futures contracts buying put options or selling call options.
- **Anticipating future cash flows** - When a portfolio manager expects to receive a large inflow of cash to be invested in a particular asset, then futures can be used to fix the price at which it will be bought and offset the risk that prices will have risen by the time the cash flow is received.



Use of Derivatives

- **Asset allocation changes** - Used to take advantage of anticipated short-term directional market movements or to implement a change in strategy - can be made more swiftly and less expensively using derivatives
- **Arbitrage** - The process of deriving a risk-free profit from simultaneously buying and selling the same asset in two different markets, when a price difference between the two exists
- **Speculation** - Betting on the future direction of prices

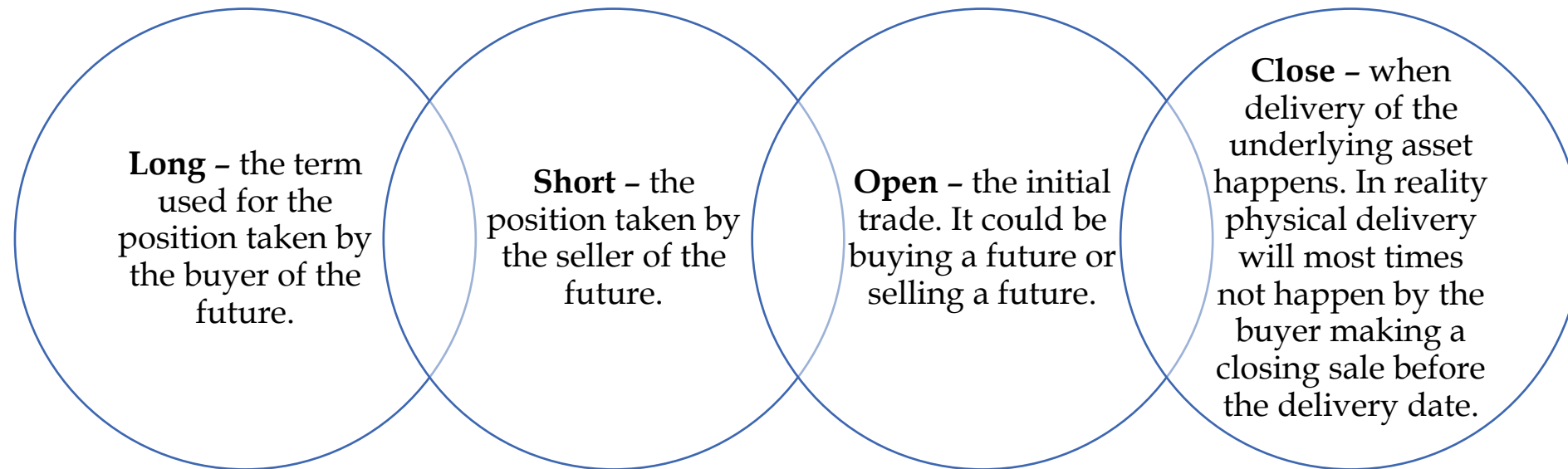
The vast majority of derivatives take one of four forms: **forwards, futures, options and swaps.**



- A **future** is a legally binding agreement between a **buyer** and a **seller**.
- The **buyer** agrees to pay a pre-specified amount for the delivery of a particular pre-specified quantity of an asset at a pre-specified future date.
- The **seller** agrees to deliver the asset at the future date, in exchange for the pre-specified amount of money.
- **Effectively a forward sale/purchase**
- **Example**
 - A buyer might agree with a seller to pay US\$50 per barrel for 1,000 barrels of crude oil in three months' time. The buyer might be an electricity-generating company wanting to fix the price it will have to pay for the oil to use in its oil-fired power stations, and the seller might be an oil company wanting to fix the sales price of some of its future oil production.
- **2 Distinct Features:**
 - It is **exchange-traded** – e.g. ICE Europe in London or the CME in the US.
 - It is dealt on **standardised terms** – the exchange specifies the quality of the underlying asset, the quantity underlying each contract, the future date and the delivery location.



Futures Terminology



Options

An option gives a buyer the right, but not the obligation, to buy or sell a specified quantity of an underlying asset at a pre-agreed exercise price, on or before a pre-specified future date or between two specified dates.

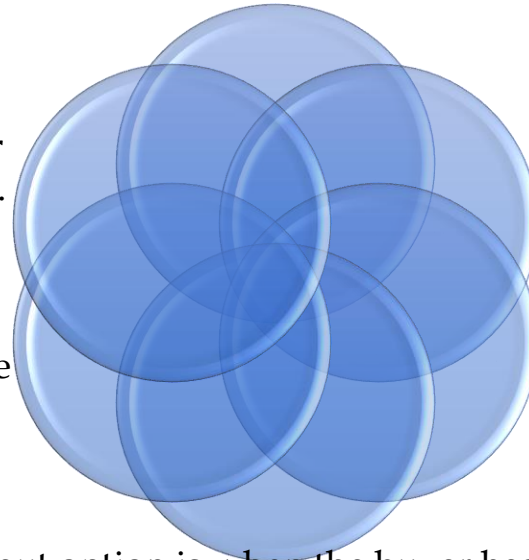
The sellers of options are referred to as the writers of those options. Their sale is also referred to as taking for the call or taking for the put.

The buyers of options are the owners of those options. They are also referred to as holders.

A put option is when the buyer has the right to sell the underlying asset at the exercise price. The seller of the put option is obliged to take delivery and pay the exercise price, if the buyer exercises the option.

The seller, in exchange for the payment of a premium, grants the option to the buyer.

A call option is when the buyer has the right to buy the asset at the exercise price, if they choose to. The seller is obliged to deliver if the buyer exercises the option.



Options Example

- Suppose shares in Jersey plc are trading at US\$3.24 and an investor Frank buys a US\$3.50 call for three months from Steve.
- **If Jersey shares are below US\$3.50 three months later (upon expiry) – what will Frank do?**
- Will abandon the option and Steve will keep the premium Frank paid him.
- **If they rise to, say, US\$6.00 – what will Frank do?**
- • exercise the option (buy the shares at US\$3.50 each and keep them, or sell them at US\$6.00 per share) or
- • If cash settled: Steve gives him $US\$6.00 - US\$3.50 = US\$2.50$ per share to settle the transaction.
- If Frank paid a premium of 42 cents to Steve, **what is Frank's maximum loss and what level does Jersey plc have to reach for Frank to make a profit?**
- Max loss is 42 cents. To make a profit $\$3.50 + \$0.42 = US\$3.92$ [Breakeven point].
- **What is max gain or loss for Steve?**
- Gain is 42 cents. Loss depends on whether 'covered' or 'naked' – if the latter unlimited



A **swap** is an agreement to exchange one set of cash flows for another.

- Are a form of OTC derivative
- Negotiated between the parties to meet their different needs, so each tends to be unique

Interest rate swaps are the most common form of swaps. They involve an exchange of interest payments – swapping payment of a fixed rate of interest with payment of a floating rate of interest.

- They are usually used to hedge exposure to interest rate changes
- The 2 exchanges of cash flow are known as the **legs of the swap** and the amounts to be exchanged are calculated by reference to a notional amount (i.e. the amount of debt)



Credit Default Swap

Credit derivatives are instruments whose value depends on agreed **credit events** relating to a third-party company, for example, changes to the credit rating of that company, or an increase in that company's cost of funds in the market, or credit events relating to it.

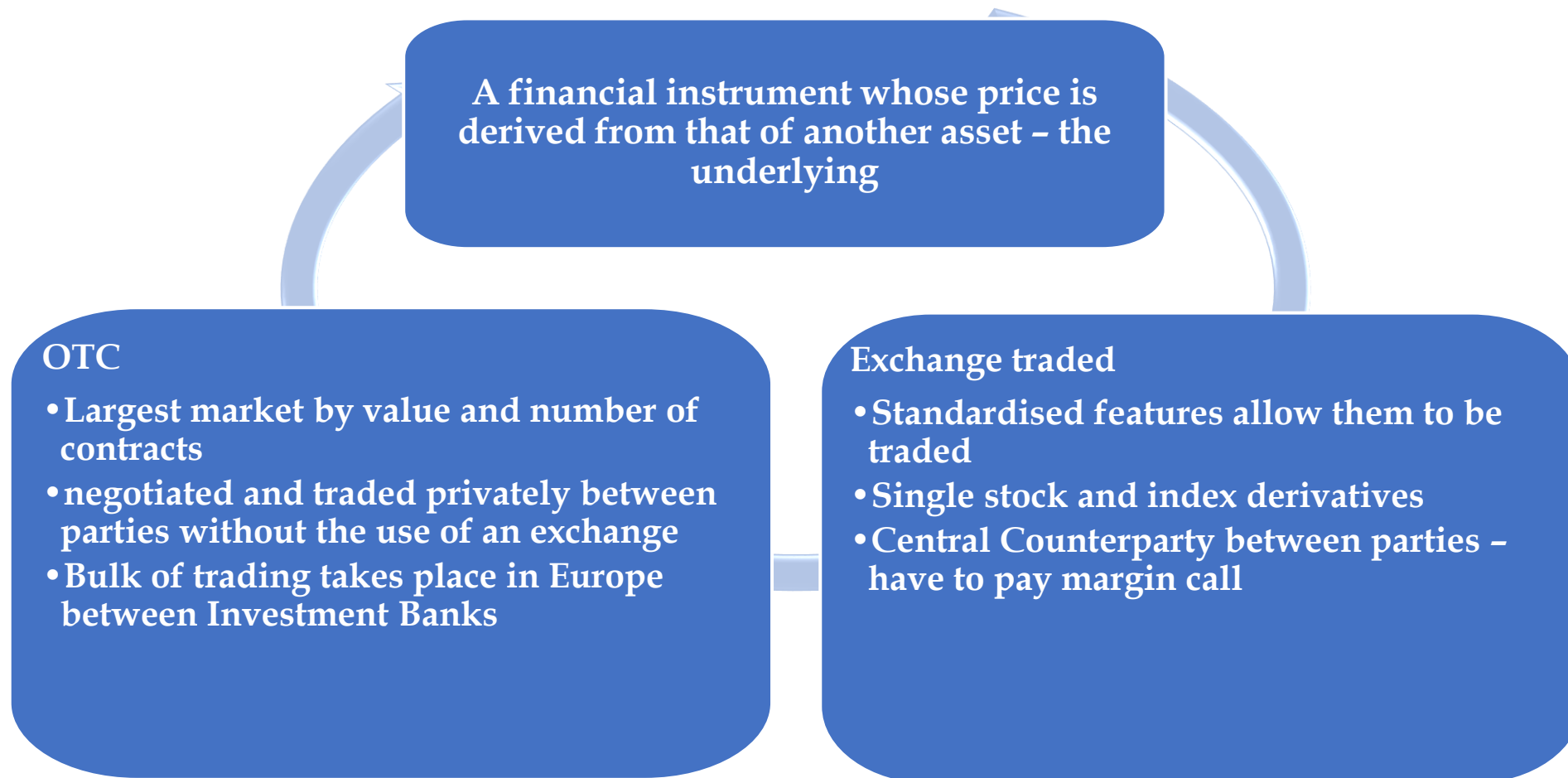
Credit events include:

- A material default
- Bankruptcy
- A significant fall in an asset's value
- Debt restructuring for a specified reference asset

The purpose of credit derivatives is to enable an organisation to protect itself against unwanted credit exposure by passing that exposure on to someone else.

A CDS is actually more like an option. The party buying credit protection makes a periodic payment (or up-front fee) to the seller. In return, the buyer receives an agreed compensation if there is a credit event relating to some third party or parties.





Examples of leading derivatives exchanges

Market	Location	Instruments Traded
CME	US	<ul style="list-style-type: none">❑ Interest rates; equities; currencies; commodities❑ It operates the CME, the CBOT, NYMEX (New York Mercantile Exchange) and COMEX derivatives exchanges.
ICE	US and UK	<ul style="list-style-type: none">❑ Energy commodity contracts – crude oil; natural gas; power and emissions
	UK	<ul style="list-style-type: none">❑ ICE Europe - Interest rate futures; Equity indices; Individual equities
Eurex	Germany	<ul style="list-style-type: none">❑ Bond futures and options
LME	UK	<ul style="list-style-type: none">❑ Non-precious , non-ferrous metals – copper, aluminium; zinc



Advantages and Disadvantages of Derivatives

Advantages

- Enables producers and consumers of goods to achieve certainty of price and delivery.
- Enables investors and portfolio managers to hedge (reduce) the risk
- Offers the ability to speculate on a wide range of assets and markets to make large bets on price movements using the geared nature of derivatives

Disadvantages

- Investors can lose more than their initial outlay
- Derivatives markets thrive on price volatility, meaning that professional investment skills and experience are required.
- In the OTC markets, there is a risk that a counterparty may default on their obligations, and so it requires great attention to detail in terms of counterparty risk assessment, documentation and the taking of collateral.

