

Module # 6 – Component # 1



Derivative Markets and Instruments

This Component:

- focuses on the basics of **Derivative Markets and Instruments** as part of our examination of Derivatives.
- assumes a base level of financial theory, but attempts to add a level of practical application. We attempt to “fill the gap” between theory and practice.
- is one of many comprising the Investor Campus “Basics of Series”.

Objectives

This module is designed as a basic introduction Derivatives.

The following topics are covered:

- Derivative instrument
- arbitrage opportunity,
- forward contract
- futures contract
- options (both put and call)
- options on futures
- and swaps.

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Forward Contracts

Each of the Forward, Futures, Options and Swaps are dealt with in more detail in a separate component. So too are Risk Management Strategies.

Distinguish between an option buyer and an option writer

As the word implies, a derivative instrument is one whose value depends on the value of something else. The derivatives we will deal with are forward contracts, futures contracts, option contracts, options on futures and swap contracts. We start by describing what the terms mean.

Forward Contract:

- A forward contract always involves a contract initiated at the start, with performance in accordance with the terms of the contract occurring at a later time.
- There is an exchange of assets with the price at which the exchange occurs being set at the time of the initial contracting.
- The actual payment and delivery of the asset occurs at the later time.

An example of a forward contract would be a foreign currency forward contract, which would call for the exchange of some quantity of a foreign currency at a future date in exchange for a payment at that later date.

Futures Contract

- A futures contract is a type of forward contract with highly standardised and closely specified contract terms.
- As in all forward contracts, a futures contract calls for the exchange of some good at a future date for cash, with the payment for the good to be made at that future date.
- The purchaser of a Futures Contract undertakes to receive delivery of the good and to pay for it, while the seller of the Futures promises to deliver the good and receive payment.

Options

Option contracts are either **put** or **call** options.

- **Call Option.** The owner of a Call Option has the right to purchase the underlying good at a specific price, and this right lasts until a specific date.
- **Put Option.** The owner of a Put Option has the right to sell the underlying good at a specific price, and this right lasts until a specific date.

Option Characteristics

Options are created only by buying and selling.
Therefore, for every owner of an option, there is a seller.

Options on futures

- An option on a futures contract (also called a futures option) is one that takes a futures option contract as its underlying good.
- The structure is similar to that of an option on something physical (as described above).
- For both instruments, the option owner has the right to exercise and **the seller** has the duty to perform on exercise.
- Upon exercising the futures option, however, the call owner receives a long position in the underlying futures at the settlement price prevailing at the time of exercise.
- The call owner also receives a payment that equals the settlement price minus the exercise price of the futures option.

Swaps

- A swap is an agreement between two or more parties to exchange sequences of cash flows over a period in the future.
- For example, Party A may agree to pay a fixed rate of interest on a \$1 million each year for five years to party B.
- In return Party B may pay a floating rate of interest on \$1 million each year for five years.
- The parties that agree to the swap are known as the counterparties.
- There are two common kinds of swap, namely interest rate swaps and currency swaps.
- Swaps are generally custom-tailored to the needs of the counterparties, generally developing a contract that is completely dedicated to meeting their particular needs.

The No-Arbitrage Principle

To discuss the no-arbitrage principle we first need to develop a basic understanding of arbitrage.

An **arbitrage** opportunity is a chance to make riskless profit with no investment.

An **arbitrageur** is a person who engages in arbitrage.

Illustrative Example
Shares of IBM trade on both the New York Stock Exchange and the Pacific Stock Exchange. Suppose the shares of IBM trade for \$65 on the New York market and for \$60 on the Pacific Exchange.
A trader could make the following two transactions simultaneously:
Buy 1 share of IBM on the Pacific Exchange for \$60
Sell 1 share of IBM on the New York Exchange for \$65
The two transactions generate a riskless profit of \$5.

- Because both trades are assumed to occur simultaneously, there is no investment. Thus this opportunity qualifies as an arbitrage opportunity.
- The no-arbitrage principle states that any rational price for a financial instrument must exclude arbitrage opportunities.
- This is one of the minimal requirements for a feasible or rational price for any financial instrument.

In what follows we will be using the no-arbitrage principle in describing the pricing principles for each instrument.

Differences between Futures and Forwards

The difference between a futures contract and a forward contract

In order to distinguish between a futures contract and a forward contract you first need to understand what they are.

The definitions are given above.

From there you will see that a futures contract is a type of a forward contract with the following characteristics:

- 1)** Futures contracts always trade on an organised exchange.
- 2)** Futures contracts are always highly standardised with a specified quantity of a good, with a specific delivery date and delivery mechanism.
- 3)** Performance on futures contracts is guaranteed by a clearinghouse.
- 4)** All futures contracts require that traders post margin in order to trade. A margin is a good faith deposit made by a prospective futures trader to indicate his or her willingness and ability to fulfil all financial obligations that may arise from trading futures.
- 5)** Futures markets are regulated by an identifiable government agency.

A forward contract on the other hand trades in an unregulated market and does not require the five points above. However, futures and forwards are essentially similar contracts and have similar results.

Financial Derivatives and the Market

How financial derivatives contribute to market completeness

Complete market:	A complete market is a market in which any and all identifiable payoffs can be obtained by trading the securities available in the market.
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For example in order to have a complete market a trader must be able to purchase a set of securities in order to obtain any payoff he can think of.

From this definition we see that a complete market is an idealisation that is most likely always unobtainable in practice.

Nonetheless, completeness is a desirable characteristic of a financial market, because it can be shown that access to a complete market increases the welfare of the agents in the economy.

Even if an actual market can never be truly complete, the more closely the market approaches completeness, the better off the economic agents are in the economy. Financial derivatives play a valuable role in financial markets because they help to move the market closer to completeness.

If we consider two financial markets that are the same, except that one includes financial derivatives, the market with financial derivatives will allow traders to shape the risk and return characteristics of their portfolios more exactly, thereby increasing the welfare of traders and the economy in general.

The Major Applications of Financial Derivatives

The major applications of financial derivatives are:

Market Completeness

- A complete market is a market in which any and all identifiable payoffs can be obtained by trading the securities available in the market.

Speculation

- Financial derivatives allow traders the ability to expose themselves to calculated and well understood risks in the pursuit of profits.
- For example traders can speculate on a rise or fall in interest rates, change in currencies against each other or on a host of other specific propositions.

Risk Management

- Financial derivatives are a powerful tool for limiting risks.
- For example a corporation that is planning to issue bonds faces considerable interest rate risk.
- If interest rates rise before the bond is issued, the firm will have to pay considerably more over the life of the bond.
- This firm can use interest rate futures to control its exposure to this risk.

Trading Efficiency

- Traders can use one or more financial derivatives as a substitute for a position in the more fundamental underlying instruments.
- For example an option position can mimic the profit or loss performance of an underlying stock index.
- In many instances traders find financial derivatives to be a more attractive instrument than the underlying security owing to substantially lower transaction costs and higher liquidity in the financial derivatives market.

Summary

- 1) A derivative instrument is one whose value depends on the value of something else.
- 2) A forward contract is a type of a contract initiated at the start with performance in accordance with the terms of the contract occurring at a later time. There is an exchange of assets and the price at which the exchange occurs is set at the time of the initial contracting. The actual payment and delivery of the asset occur at the later time.
- 3) A futures contract is a type of a forward contract with highly standardised and closely specified contract terms. A futures contract has the following characteristics:
 - a) Futures contracts always trade on an organised exchange.
 - b) Futures contracts are always highly standardised with a specified quantity of a good, with a specific delivery date and delivery mechanism.
 - c) Performance on futures contracts is guaranteed by a clearinghouse.
 - d) All futures contracts require that traders post margin in order to trade.
 - e) Futures markets are regulated by an identifiable government agency.
- 4) A clearinghouse is a financial institution associated with the futures exchange that guarantees the financial integrity of the market to all traders.
- 5) A margin is a good faith deposit made by the prospective futures trader to indicate his or her willingness and ability to fulfil all financial obligations that may arise from trading futures.
- 6) **Call option** – The owner of a call has the right to purchase an underlying good at a specific price, and this right lasts until a specific date
- 7) **Put option** – The owner of a put option has the right to sell the underlying good at a specific price, and this right lasts until a specific date.