Introduction

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Contents

Chapter Highlights **1**
1.1 Exchange-traded markets . . . 1
1.2 Over-the-counter markets . . . 1
1.3 Forward contracts . . . 2
1.4 Futures contracts . . . 3
1.5 Options . . . 4
Types of traders . . . 4
Hedgers . . . 4
Speculators . . . 4
Arbitrageurs . . . 5
Dangers . . . 5

Chapter Highlights

1.1 Exchange-traded markets

A *derivative exchange* is a market where individuals and companies trade standardized contracts that have been defined by the exchange.

The CBOT and CME have merged to form the CME group.

- Chicago Board of Trade (CBOT) 1848
- Chicago Mercantile Exchange (CME) 1919
- New York Mercantile Exchange (NYMEX)
- Kansas City Board of Trade (KCBT)
- The Chicago Board Options Exchange (CBOE) 1973

Once two traders have agreed to trade a product offered by an exchange, it is handled by the *exchange clearing house*. The clearing house manages the risk between the two traders.

1.2 Over-the-counter markets

Banks and other large financial institutions such as fund managers, insurance agencies, and large corporations are the main participants in OTC derivatives markets.

Once an OTC trade has been agreed, the two parties can either present it to a central coutnerparty (CCP) or clear the trade bilaterally.

The over-the-counter market is significantly bigger than the exchange traded market for derivatives.

However, the OTC market has not grown much since 2007 because of the popularity of a procedure called *compression*. Compression is where two or more counterparties restructure transactions with each other with the result that the underlying principal is reduced.

1.3 Forward contracts

A *forward contract* is an agreement to buy or sell an asset at a certain future time for a certain price. A *spot contract* is an agreement to buy or sell an asset almost immediately.

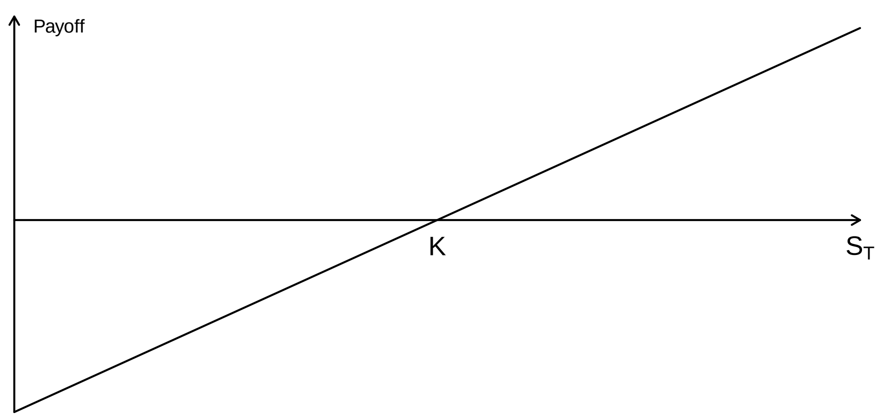
Forward contracts are traded in over-the-counter markets.

The *long position* agrees to buy the underlying asset at a certain time and price.

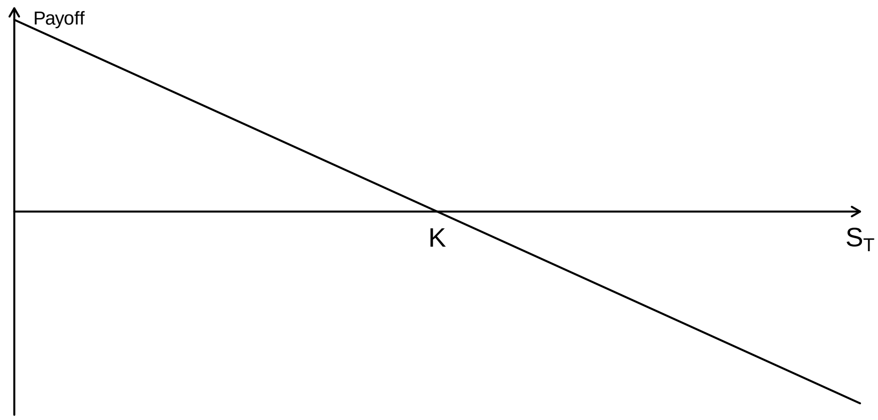
The *short position* agrees to sell the underlying asset at a certain time and price.

Payoffs from forward contracts

Long position: $S_T - K$



Short position: $K - S_T$



Where:

- S_T is the spot price of the asset at maturity of the contract.
- K is the delivery price.

Forward prices and spot prices

Consider a stock that pays no dividend and is worth \$60. You can borrow or lend money for 1 year at 5%. What should the 1-year forward price of the stock be?

The answer is \$60 grossed up at 5% for 1 year, or \$63. If the forward price is more than this say \$67, you could borrow \$60, buy one share of the stock, and sell it forward for \$67. After paying off the loan, you would net a profit of \$4 in 1 year. If the forward price is less than \$63, say \$58, an investor owning the stock as part of a portfolio would sell the stock for \$60 and enter into a forward contract to buy it back for \$58 in 1 year. The proceeds of investment would be invested at 5% to earn \$3. The investor would end up \$5 better off than if the sotck were in the portfolio for the year.

1.4 Futures contracts

Similar to forward contracts, a *futures contract* is an agreement between two parties to buy or sell an asset at a certain time in the future for a certain price. However, futures contracts are traded on an exchange.

To make trading possible, the exchange speicifies certain standardized features of the contract.

Two large exchanges on which futures contracts are traded are the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (CME), which have now merged to form the CME Group.

On these exchanges a wide variety of commodities and financial assets form the underlying assets in the various contracts.

The commodities include pork bellies, live cattle, sugar, wool, lumber, copper, aluminum, gold, and tin.

The financial assets include stock indices, currencies, and Treasury bonds.

1.5 Options

Options are traded both on exchanges and in the over-the-counter market.

Two types of options:

- *Call option* gives the holder the right to buy the underlying asset by a certain date for a certain price.
- *Put option* gives the holder the right to sell the underlying asset by a certain date for a certain price.

The price in the contract is known as the *exercise price* or *strike price*.

The date in the contract is known as the *expiration date* or *maturity*.

American options can be exercised at any time up to the expiration date.

European options can be exercised only on the expiration date itself.

The largest exchange in the world for trading stock options is the Chicago Board Options Exchange (CBOE).

There are four types of participants in options markets:

1. Buyers of calls
2. Sellers of calls
3. Buyers of puts
4. Sellers of puts

Buyers are referred to as having long positions and sellers are referred to having short positions.

Selling an option is also known as writing the option.

Types of traders

There are three broad categories of traders: hedger, speculators, and arbitrageurs. Hedgers use derivatives to reduce the risk that they face from potential future movements in a market variable. Speculators use them to bet on the future direction of a market variable. Arbitrageurs take offsetting positions in two or more instruments to lock in a profit.

Hedgers

Suppose that it is May 21, 2020, and ImportCo, a company based in the United States, knows that it will have to pay 10 million pounds on August 21, 2020, for goods it has purchased from a British supplier. The GBP/USD exchange rate quotes made by a financial institution are shown in Table 1.1. Import Co could hedge its foreign exchange risk by buying pounds (GBP) from the financial institution in the 3-month forward market at 1.2225. This would have the effect of fixing the price to be paid to the British exporter at $12,225,000.

Speculators

Arbitrageurs

Dangers