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Investment Foundations

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Module 4: INVESTMENT INSTRUMENTS

Chapter 11: Derivatives

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Module	Topic	Weight	LOS	Exam Qs	Hours to Study	Module Practice Qs	Chapter Practice Qs
Module 1	Industry overview	5%	7	6	5	28	28
Chapter 1	The Investment Industry: A Top-Down View						
Module 2	Ethics and regulation	10%	14	12	10	91	
Chapter 2	Ethics and Investment Professionalism						49
Chapter 3	Regulation						42
Module 3	Inputs and tools	20%	50	24	20	291	
Chapter 4	Microeconomics						53
Chapter 5	Macroeconomics						57
Chapter 6	Economics of International Trade						47
Chapter 7	Financial Statements						70
Chapter 8	Quantitative Concepts						64
Module 4	Investment instruments	20%	29	24	20	213	
Chapter 9	Debt Securities						69
Chapter 10	Equity Securities						72
Chapter 11	Derivatives						42
Chapter 12	Alternative Investments						30
Module 5	Industry structure	20%	27	24	20	96	
Chapter 13	Structure of the Investment Industry						28
Chapter 14	Investment Vehicles						29
Chapter 15	The Functioning of Financial Markets						39
Module 6	Serving client needs	5%	12	6	5	76	
Chapter 16	Investors and Their Needs						35
Chapter 17	Investment Management						41
Module 7	Industry controls	20%	24	24	20	154	
Chapter 18	Risk Management						51
Chapter 19	Performance Evaluation						53
Chapter 20	Investment Industry Documentation						50
	Total	100%	163	120	100	949	949

AFTER COMPLETING THIS CHAPTER, YOU SHOULD BE ABLE TO DO THE FOLLOWING:

- a) Define a derivative contract;
- b) Describe uses of derivative contracts;
- c) Describe key terms of derivative contracts;
- d) Describe forwards and futures;
- e) Distinguish between forwards and futures;
- f) Describe options and their uses;
- g) Define swaps and their uses.

DERIVATIVES

A forward contract is an over-the-counter derivative contract in which two parties agree that one party, the buyer, will purchase an underlying asset from the other party, the seller, at a later date at a fixed price they agree upon when the contract is signed.

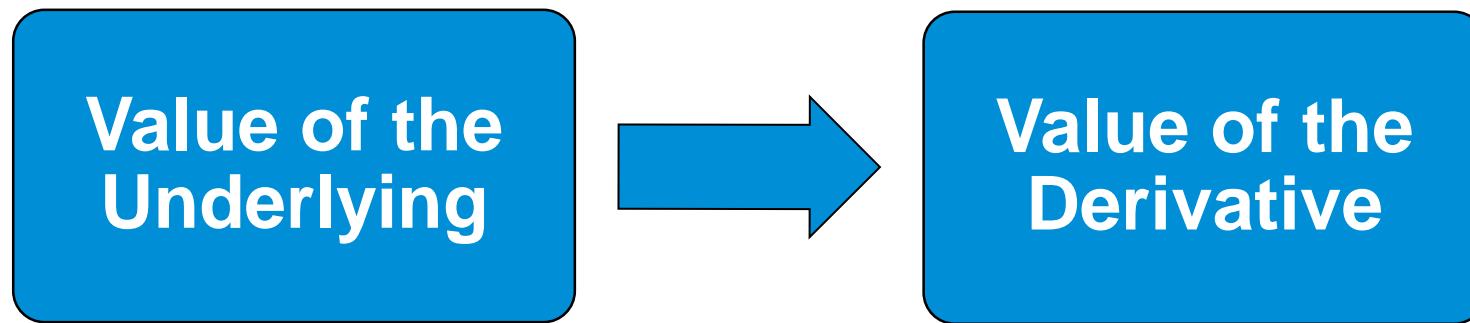
A futures contract is a standardized derivative contract created and traded on a futures exchange in which two parties agree that one party, the buyer, will purchase an underlying asset from the other party, the seller, at a later date at a price agreed upon by the two parties when the contract is initiated and in which there is a daily settling of gains and losses and a credit guarantee by the futures exchange through its clearinghouse.

Options give one party (the buyer) to the contract the right to extract an action from the other party (the seller) in the future. In an option contract, the buyer of the option has the right, but not the obligation, to buy or sell the underlying.

A swap contract is an over-the-counter derivative contract in which two parties agree to exchange a series of cash flows whereby one party pays a variable series that will be determined by an underlying asset or rate and the other party pays either 1) a variable series determined by a different underlying asset or rate or 2) a fixed series.

LOS a: Define a derivative contract.

DERIVATIVES



LOS a: Define a derivative contract.

USES OF DERIVATIVES



- A farmer anticipates having at least 50,000 bushels of wheat for sale in six months.
- Wheat is currently trading in the market at \$9.00 per bushel—**the spot price**.
- The farmer finds a cereal producer that needs wheat and is willing to contract to buy 50,000 bushels of wheat at a price of \$8.50 per bushel in six months.
- The contract provides a **hedge** for both the farmer and the cereal producer.

LOS b: Describe uses of derivative contracts.

USES OF DERIVATIVES



- But what if the farmer cannot find someone who actually needs the wheat?
- The farmer might still find a counterparty that is willing to enter into a contract to buy the wheat in the future at an agreed on price.
- This counterparty may be called a **speculator**.
 - This counterparty is not hedging risk but is instead taking on risk in anticipation of earning a return.

LOS b: Describe uses of derivative contracts.

COMMON CHARACTERISTICS

Underlying

- It must be clearly defined because quality can vary.
- Based on tangible assets or on outcomes

Size and Price

- Size is amount of the underlying to be exchanged.
- Price specified is not the current price but a price for future delivery.

Expiration Date

- All derivatives have a finite life.

Settlement

- It can occur at or before maturity.
- Some may require physical delivery and others cash settlement.

LOS c: Describe key terms of derivative contracts.

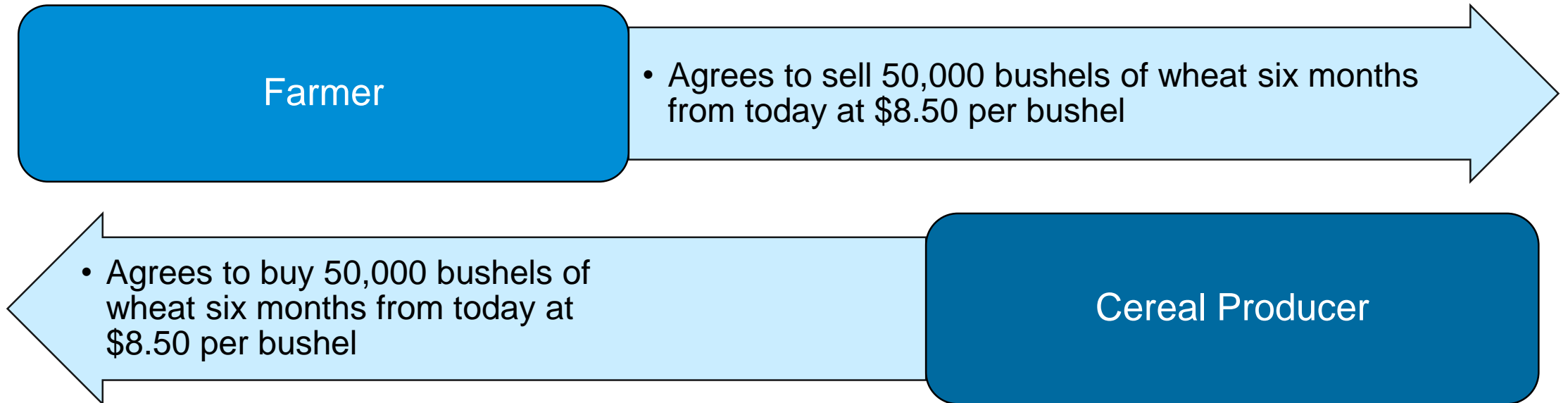
THE UNDERLYING

Examples of underlyings include the following:

- Agricultural products, including livestock
- Currencies
- Interest rates
- Individual shares and equity indices
- Bond indices
- Economic factors (such as the inflation rate)
- Natural resources (such as crude oil, natural gas, gold, silver, and timber)
- Weather-related products (such as heating or cooling days)
- Other products (such as electricity or fertilisers)

LOS c: Describe key terms of derivative contracts.

FORWARD CONTRACTS



- A **forward contract** is for delivery in the future with set terms.
- It is traded in the **over-the-counter market**.
- There is **counterparty risk** that the other side cannot deliver or pay.
- **No payment on the contract is required by either party prior to delivery.**

LOS d: Describe forwards and futures.

FUTURE CONTRACTS

Futures contracts are similar to forward contracts, but...

They are standardised contracts that trade on an exchange as an intermediary between buyers and sellers to reduce counterparty risk.

Because they are traded on an exchange, they are liquid.

Margin requirements are determined by the volatility of the underlying asset.

Positions are marked to market daily.
If a position loses money, the customer can be required to add money or the position is closed.

LOS d: Describe forwards and futures.

COMPARISON OF FORWARD AND FUTURES CONTRACTS: SIMILARITIES

Similarities

Both types of contracts exist on a wide range of underlyings, including shares, bonds, agricultural products, and precious and industrial metals, among others.

For both types of contracts, both the buyer and seller have obligations.

Both types of contracts allow locking in a price today for a transaction that will occur in the future.

LOS e: Distinguish between forwards and futures.

COMPARISON OF FORWARD AND FUTURES CONTRACTS: DIFFERENCES

Differences

Trading and Flexibility of Terms

- Forward contracts transact in the over-the-counter market and are customised according to the contracting parties' needs.
- Futures contracts trade on exchanges that typically set the standardised terms of the contracts. For hedgers that are trying to reduce or eliminate risk, standardisation makes it difficult to precisely hedge a position.

Liquidity

- It is easier to exit a position prior to the settlement date with a futures contract than with a forward contract.
- A position in a futures contract can be settled (closed) by taking an opposite position in the same contract.

LOS e: Distinguish between forwards and futures.

COMPARISON OF FORWARD AND FUTURES CONTRACTS: DIFFERENCES

Differences

Counterparty Risk

- Risk is high with forward contracts, but limited with futures contracts.
- Requirements imposed by exchanges, such as margins and daily marking to market, reduce the counterparty risk associated with futures contracts.

Transaction Costs

- There can be significant costs to arrange a forward contract.
- Because futures contracts are standardised, transaction costs are relatively low.
- Also, there is more transparency in the futures markets.

LOS e: Distinguish between forwards and futures.

COMPARISON OF FORWARD AND FUTURES CONTRACTS: DIFFERENCES

Differences

Timing of Cash Flows

- Forward contracts have no cash flows except at maturity.
- Futures contracts are marked to market daily.
- It is important to note that if forward and futures contracts with identical terms are held to maturity, the final outcome is the same.

Settlement

- Forward contracts may settle with physical delivery or cash settlement.
- Futures contracts are typically settled with cash.

LOS e: Distinguish between forwards and futures.

PRACTICE Q: DIFFICULT

A contract in which one party directly enters into a customised agreement with a party to take delivery of a quantity of corn, at a specified price, at some future date, is called a:

- A. spot contract.
- B. futures contract.
- C. forward contract.

PRACTICE Q: DIFFICULT

A contract in which one party directly enters into a **customised** agreement with a party to take delivery of a quantity of corn, at a specified price, at some future date, is called a:

- A. spot contract.
- B. futures contract.
- C. forward contract.**

C is correct. In a forward contract, one party directly enters into an agreement with another party to deliver a commodity, such as corn, at a specified price at some future date.

In the spot market the contract is for immediate delivery of the commodity at the spot price

A futures contract is a standardised agreement whereas a forward contract is a customised agreement.

PRACTICE Q: DIFFICULT

A key distinction between forward contracts and futures contracts is that forward contracts:

- A. are only settled with cash.
- B. have lower transactions costs.
- C. have no cash flows except at maturity.

PRACTICE Q: DIFFICULT

A key distinction between forward contracts and futures contracts is that forward contracts:

- A. are only settled with cash.
- B. have lower transactions costs.
- C. have no cash flows except at maturity.**

C is correct. Forward contracts have no cash flows except at maturity, whereas futures contracts are marked to market daily.

Transactions costs for futures contracts are lower than forward contracts because futures are standardised.

Forward contracts may be settled with cash or physical delivery of the underlying.

OPTION CONTRACTS: KEY TERMS

Buyer (who has the right)

Seller (or writer who has the obligation)

Underlying

Contract Size

Exercise Price (or strike price)

Expiration Date (when the option expires)

Option Premium (what the buyer pays for the option)

LOS f: Describe options and their uses.

OPTION CONTRACTS: KEY TERMS

Call Option: The buyer of the option has the right (but not the obligation) to buy the underlying at the fixed price (exercise price). (Buy Low Sell High)

Put Option: The buyer of the option has the right (but not the obligation) to sell the underlying at the fixed price (exercise price). (Sell High Buy Low)

	Call Option	Put Option
In the money (would be exercised)	$MP > EP$	$MP < EP$
At the money (may be exercised)	$MP = EP$	$MP = EP$
Out of the money (not exercised)	$MP < EP$	$MP > EP$

MP = Market price
of underlying asset
EP = Exercise price
for option

LOS f: Describe options and their uses.

OPTION CONTRACTS

Calls

When the price of the underlying is **above** the exercise price for a call, the call is in-the-money.
(Buy Low Sell High)

If the price of the underlying is the same as the exercise price, the call is at-the-money and

When the price of the underlying is below the exercise price for a call, the option is said to be out-of-the-money.

Puts

When the price of the underlying is **below** the exercise price for a put, the put is in-the-money.
(Sell High Buy Low)

If the price of the underlying is the same as the exercise price, the put is at-the-money and

When the price of the underlying is above the exercise price for a put, the option is said to be out-of-the-money.

PRACTICE Q: EXPERT

- Q. Which of the following options would be described as being in the money?
- A. A put option in which the underlying's price is lower than the exercise price.
 - B. A call option in which the underlying's price is lower than the exercise price.
 - C. A put option in which the underlying's price is higher than the exercise price.

PRACTICE Q: EXPERT

Q. Which of the following options would be described as being in the money?

- A. A put option in which the underlying's price is lower than the exercise price. (Sell High Buy Low)
- B. A call option in which the underlying's price is lower than the exercise price.
- C. A put option in which the underlying's price is higher than the exercise price.

A is correct. A put option is in the money when the underlying's price is lower than the exercise price. The put buyer has the right to sell the underlying at the exercise price, which is higher than the current market price of the underlying.

When the price of the underlying is below the exercise price for a put, the option is said to be in-the-money.

If the price of the underlying is the same as the exercise price, the put is at-the-money and

If it is above the exercise price, the put is out-of-the-money.

	Call Option	Put Option
In the money (would be exercised)	$MP > EP$	$MP < EP$
At the money (may be exercised)	$MP = EP$	$MP = EP$
Out of the money (not exercised)	$MP < EP$	$MP > EP$

PRACTICE Q: EXPERT

Consider a put option whereby the market price of the underlying stock is greater than the exercise price. At maturity, the profit for the holder of the put option is most likely:

- A. equal to zero.
- B. less than zero.
- C. greater than zero.

PRACTICE Q: EXPERT

Consider a put option whereby the market price of the underlying stock is greater than the exercise price. At maturity, the profit for the holder of the put option is most likely:

- A. equal to zero.
- B. less than zero.**
- C. greater than zero.

B is correct. If the market price of the underlying stock exceeds the exercise price, the put option at maturity is worthless. **Because the buyer has paid a premium, the profit is less than zero.**

EFFECTS OF AN INCREASE IN A FACTOR ON THE VALUES OF A CALL OPTION AND A PUT OPTION

Assume Factor Increases	Call Option Premium	Put Option Premium
Underlying's price	Increases	Decreases
Exercise price	Decreases	Increases
Time to expiration	Increases	Increases
Underlying's volatility	Increases	Increases

LOS f: Describe options and their uses.

SWAP CONTRACTS

Most Swaps

- Contract between two parties
- Forward commitment and a bilateral contract

Example: An **interest rate swap**, the most common type, allows companies to swap their interest rate obligations (usually a fixed rate for a floating rate) to manage interest rate risk,

Credit Default Swaps (CDS)

- One party buys protection against default
- Contingent commitment and a unilateral contract

One party buys a CDS to protect itself against a loss of value in a debt security or index of debt securities; the loss of value is primarily the result of a change in credit risk.

LOS g: Define swaps and their uses.

PRACTICE Q: DIFFICULT

The seller of a credit default swap (CDS):

- A. receives protection from the buyer in the event of a default.
- B. agrees to protect the buyer from losses in the event of a default.
- C. exchanges principal with the counterparty when the swap is initiated.

PRACTICE Q: DIFFICULT

The **seller** of a credit default swap (CDS):

- A. receives protection from the buyer in the event of a default.
- B. agrees to protect the buyer from losses in the event of a default.**
- C. exchanges principal with the counterparty when the swap is initiated.

B is correct. The seller of a CDS receives a periodic premium from the buyer and in exchange agrees to cover losses to the buyer in the event of a default on the reference debt instrument.

Credit Default Swaps
(CDS)

- One party buys protection against default
- Contingent commitment and a unilateral contract

CURRENCY SWAPS

US
Company

- Wants to do business in Europe, needs €40 million.
- Enters into five-year agreement to swap dollars for euros.

Both principal and interest are exchanged!

- Wants to do business in the United States.
- Enters into five-year agreement to swap €40 million for \$50 million.

European
Company

LOS g: Define swaps and their uses. Assume €1 = \$1.25

PRACTICE Q: DIFFICULT

The parties in a currency swap exchange:

- A. interest payments only.
- B. principal payments only.
- C. both principal and interest payments.

PRACTICE Q: DIFFICULT

The parties in a currency swap exchange:

- A. interest payments only.
- B. principal payments only.
- C. both principal and interest payments.**

C is correct. In a currency swap, there is an exchange of principal at the beginning and end of the swap contract. There is also an exchange of interest payments, in different currencies, during the life of the swap.

PRACTICE Q: DIFFICULT

In contrast to forward contracts, option contracts are:

- A. bilateral contracts.
- B. unilateral contracts.
- C. multilateral contracts.

PRACTICE Q: DIFFICULT

In contrast to forward contracts, option contracts are:

- A. bilateral contracts.
- B. unilateral contracts.
- C. multilateral contracts.

B is correct. Options contracts are unilateral contracts because only one party to the contract has a future commitment.

Forward contracts are bilateral contracts because both parties have a commitment to fulfil the contract provisions.

Derivatives Learning Outcomes

- d. Describe forwards and futures
- f. Describe options and their uses