



Fall 2013
ADVANCED FINANCIAL INSTRUMENTS AND MARKETS
Lecture No. 09
Market for Derivative Instruments

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Ways Derivatives are Used

- * To hedge risks
- * To speculate (take a view on the future direction of the market)
- * To lock in an arbitrage profit
- * To change the nature of a liability
- * To change the nature of an investment without incurring the costs of selling one portfolio and buying another

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Foreign Exchange Quotes

| | Bid | Offer |
|-----------------|-----|-------|
| Spot | | |
| 1-month forward | | |
| 3-month forward | | |
| 6-month forward | | |

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Forward Price

- * The forward price for a contract is the delivery price that would be applicable to the contract if were negotiated today (i.e., it is the delivery price that would make the contract worth exactly zero)
- * The forward price may be different for contracts of different maturities

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Terminology

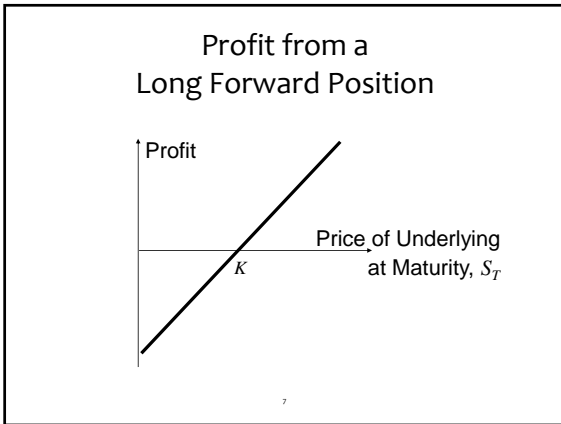
- * The party that has agreed to buy has what is termed a long position
- * The party that has agreed to sell has what is termed a short position

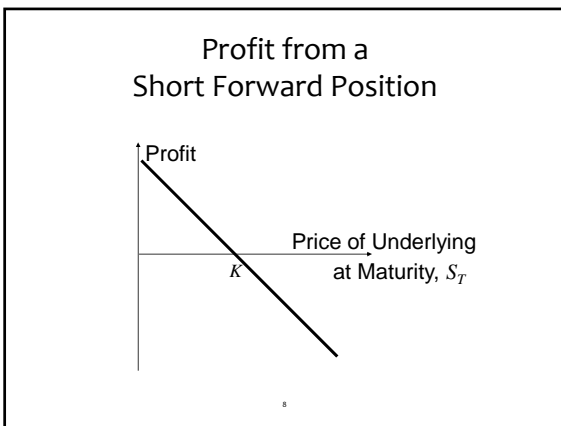
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Example

- * On July 20, 2007 the treasurer of a corporation enters into a long forward contract to buy £1 million in six months at an exchange rate of 2.0489
- * This obligates the corporation to pay \$2,048,900 for £1 million on January 20, 2008
- * What are the possible outcomes?

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Futures Contracts

- * Agreement to buy or sell an asset for a certain price at a certain time
- * Similar to forward contract
- * Whereas a forward contract is traded OTC, a futures contract is traded on an exchange

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Exchanges Trading Futures

- * Chicago Board of Trade
- * Chicago Mercantile Exchange
- * LIFFE (London)
- * Eurex (Europe)
- * BM&F (Sao Paulo, Brazil)
- * TIFFE (Tokyo)
- * Pakistan ?????

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Examples of Futures Contracts

Agreement to:

- * Buy 100 oz. of gold @ US\$900/oz. in December (NYMEX)
- * Sell £62,500 @ 2.0500 US\$/£ in March (CME)
- * Sell 1,000 bbl. of oil @ US\$120/bbl. in April (NYMEX)

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1. Gold: An Arbitrage Opportunity?

Suppose that:

- The spot price of gold is US\$900
 - The 1-year forward price of gold is US\$1,020
 - The 1-year US\$ interest rate is 5% per annum
- Is there an arbitrage opportunity?

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2. Gold: Another Arbitrage Opportunity?

Suppose that:

- The spot price of gold is US\$900
- The 1-year forward price of gold is US\$900
- The 1-year US\$ interest rate is 5% per annum

Is there an arbitrage opportunity?

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The Forward Price of Gold

If the spot price of gold is S and the forward price for a contract deliverable in T years is F , then

$$F = S(1+r)^T$$

where r is the 1-year (domestic currency) risk-free rate of interest.

In our examples, $S = 900$, $T = 1$, and $r = 0.05$ so that

$$F = 900(1+0.05) = 945$$

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1. Oil: An Arbitrage Opportunity?

Suppose that:

- The spot price of oil is US\$95
- The quoted 1-year futures price of oil is US\$125
- The 1-year US\$ interest rate is 5% per annum
- The storage costs of oil are 2% per annum

Is there an arbitrage opportunity?

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2. Oil: Another Arbitrage Opportunity?

Suppose that:

- The spot price of oil is US\$95
- The quoted 1-year futures price of oil is US\$80
- The 1-year US\$ interest rate is 5% per annum
- The storage costs of oil are 2% per annum

Is there an arbitrage opportunity?

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Options

- * A call option is an option to buy a certain asset by a certain date for a certain price (the strike price)
- * A put option is an option to sell a certain asset by a certain date for a certain price (the strike price)

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American vs European Options

- * An American option can be exercised at any time during its life
- * A European option can be exercised only at maturity

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Exchanges Trading Options

- * Chicago Board Options Exchange
- * American Stock Exchange
- * Philadelphia Stock Exchange
- * Pacific Exchange
- * LIFFE (London)
- * Eurex (Europe)
- * Pakistan ????

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Options vs Futures/Forwards

- * A futures/forward contract gives the holder the obligation to buy or sell at a certain price
- * An option gives the holder the right to buy or sell at a certain price

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Types of Traders

- Hedgers
- Speculators
- Arbitrageurs

Some of the largest trading losses in derivatives have occurred because individuals who had a mandate to be hedgers or arbitrageurs switched to being speculators (See for example Barings Bank, Business Snapshot 1.2, page 15)

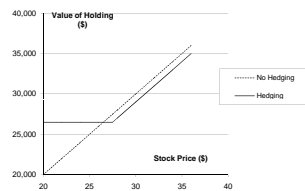
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Hedging Examples

- * A US company will pay £10 million for imports from Britain in 3 months and decides to hedge using a long position in a forward contract
- * An investor owns 1,000 Microsoft shares currently worth \$28 per share. A two-month put with a strike price of \$27.50 costs \$1. The investor decides to hedge by buying 10 contracts

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Value of Microsoft Shares with and without Hedging



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Speculation Example

- * An investor with \$2,000 to invest feels that a stock price will increase over the next 2 months. The current stock price is \$20 and the price of a 2-month call option with a strike of 22.50 is \$1
- * What are the alternative strategies?

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Arbitrage Example

- * A stock price is quoted as £100 in London and \$200 in New York
- * The current exchange rate is 2.0300
- * What is the arbitrage opportunity?

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Hedge Funds

- * Hedge funds are not subject to the same rules as mutual funds and cannot offer their securities publicly.
- * Mutual funds must
 - * disclose investment policies,
 - * makes shares redeemable at any time,
 - * limit use of leverage
 - * take no short positions.
- * Hedge funds are not subject to these constraints.
- * Hedge funds use complex trading strategies are big users of derivatives for hedging, speculation and arbitrage

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Options, Futures, and Other
Derivatives, 7th Edition,
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Thank You!
