

Course Introduction

Financial Derivatives

Finance 206/717, Section 401/402/403

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Introduction

- Main topics covered in course:
 - Using derivatives
 - Correctly pricing derivatives
- These notes:
 - a brief and intuitive introduction to pricing

Forward contracts

- The simplest derivative contract is a **forward** contract
 - (a **futures** contract is basically a forward contract traded on an exchange)
 - A forward contract is an agreement between two parties for the deferred delivery of an asset.
 - The contract specifies:
 1. the quantity and type of asset
 2. delivery time and place
 3. price
 - Both the buyer and the seller are obligated to carry out the transaction.
- Terminology:
 - if you agree to be the buyer, you are said to be **long**
 - if you agree to be the seller, you are said to be **short**

The price of a forward contract

- Apple shares currently (Aug 29, 2008) trade at \$169.53
- Question: What is the price of a forward contract for one share of Apple stock, with delivery date December 19, 2008?
- What does “price” refer to here?
 - it is the amount the long side pays to the short side at the delivery date
 - other than collateral (aka margin), this is the only monetary transfer that takes place in a forward contract
- What factors do you think affect the forward price?

A rough argument for pricing a forward contract

- Consider the following *slight variant* of the Apple forward contract
 - the long side pays today, the short side delivers share of Apple on December 19
 - (this is a pre-paid forward contract)
 - What is the most the long side would pay today?
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- Back to the actual forward contract:
 - What is the highest forward price the long side would agree to?

Forward price

- Notation:

- $F_{t,T}$ = the forward price for a contract initiated at time t for delivery at time T
- S_t = the spot price at time t (i.e., the price for immediate delivery)

- On the last slide we argued that

$$F_{t,T} \leq \$171.00$$

- What if $F_{t,T} < \$171.00$?

Forward contracts on commodities

- To start with, we'll look at forward/futures contracts on financial assets
 - e.g., a share in Apple
- In a few weeks, we'll turn to forward/futures contracts on commodities
 - oil, wheat, pork bellies, etc., etc.
- Here is a (deliberately) simple example:
 - consider a forward contract on a crate of 20,000 sheets of paper, delivery December 19.
 - the total production cost of the crate is \$169.53, not expected to change
 - what is the forward price?