Financial Futures Markets

Background on Financial Futures

- Large return with a high degree of risk
  - Reduction of risk for large institutions
- Facilitate the trading of financial futures contracts
- A financial futures contract
  - Standardized agreement to deliver or receive a specified financial instrument at a specified price and date
    - Buyer of the contract buys the financial instrument
    - Seller of the contract deliver the financial instrument at specified time

Background on Financial Futures

- Futures are a derivative security
- Derivatives
  - Securities whose value is derived from the value of some underlying asset or financial instrument
  - Derivative security prices related to factors affecting prices in the spot market
  - For example, bond futures prices are related to what is happening in markets where bonds are bought and sold for immediate delivery

Background on Financial Futures

- Traded on organized exchange
  - Futures exchange
    - Clear, settle and guarantee all transactions that occur on their exchange
    - Provide liquidity
- Regulated by Commodity Futures Trading Commission (CFTC)
  - Approve contracts before listing of futures exchanges
  - Regulation to prevent unfair trading practices

Background on Financial Futures

- Interest rate futures vs. Stock index futures
- Sellement dates
  - March, June, September, December

Purpose of Trading Financial Futures

- Speculators
  - Take position to profit from expected changes in the price of futures contracts over time
    - Take a position with the goal of profiting from expected changes in the contract's price
    - No position in underlying asset
- Hedgers
  - Take position to reduce their exposure to future movements in interest rates or stock prices.
    - Minimize or manage risks
    - Have position in spot market with the goal to offset risk
- Hedgers and Speculators serve as the counterparty on many futures transactions
  - Speculators provide liquidity

Purpose of Trading Financial Futures

- Speculators
  - Day traders
  - Position traders

Structure of the Futures Market

- In the U.S.
  - CME group
    - 2007 merge of the Chicago Board of the Trade and the Chicago Mercantile Exchange
    - The large and the most diversify derivative exchange
  - Commission brokers (floor brokers)
  - Floor traders (locals)
- OTC Trading
- Electronic Trading

Trading Futures

- Open accounts at brokerage firms
  - Margin deposit
    - Initial margin 5 – 18 percent of a future contract's full value
      - Marked to market daily
  - Type of order
    - Market order
    - Limit order

Institutional Use of Futures Markets

- Most activity is for hedging, not speculating
- Many kinds of institutions uses futures
  - Commercial banks
  - Savings institutions
  - Securities firms
  - Mutual funds
  - Pension funds
  - Insurance companies

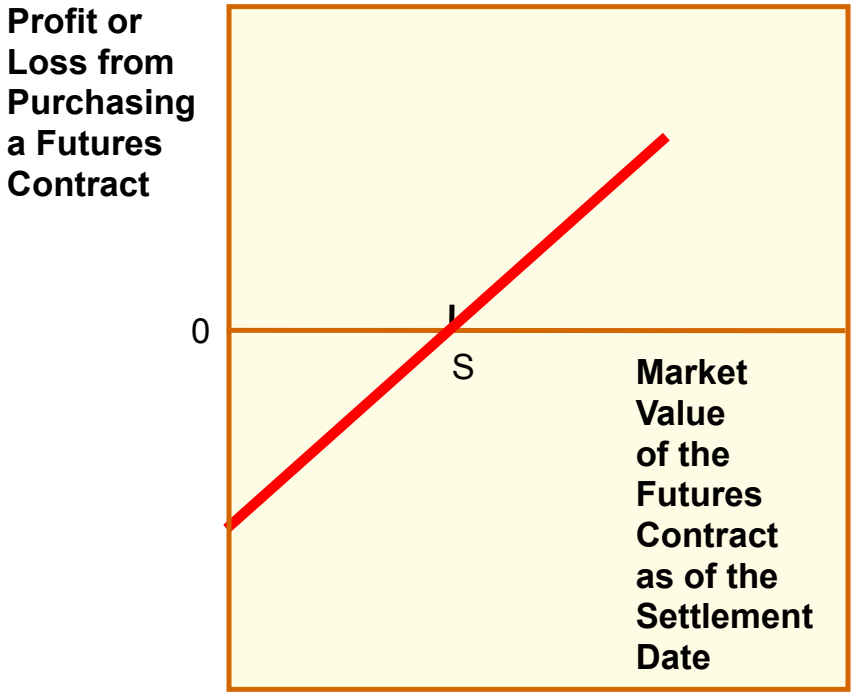
Institutional Use of Futures Markets

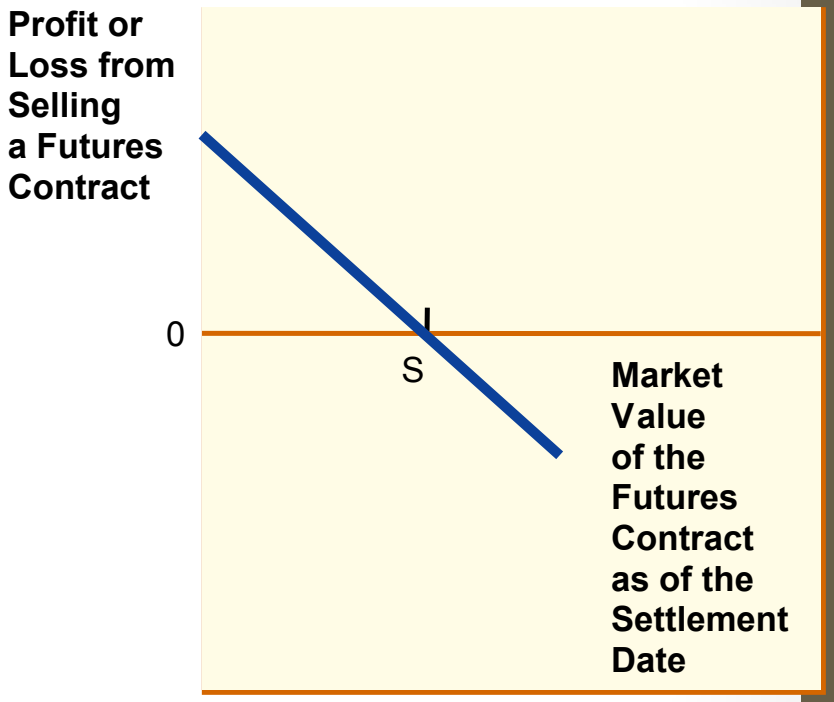
TYPE OF FINANCIAL INSTITUTION	PARTICIPATION IN FUTURES MARKETS
Commercial banks	• Take positions in futures contracts to hedge against interest rate risk.
Savings institutions	• Take positions in futures contracts to hedge against interest rate risk.
Securities firms	• Execute futures transactions for individuals and firms. • Take positions in futures contracts to hedge their own portfolios against stock market or interest rate movements.
Mutual funds	• Take positions in futures contracts to speculate on future stock market or interest rate movements. • Take positions in futures contracts to hedge their portfolios against stock market or interest rate movements.
Pension funds	• Take positions in futures contracts to hedge their portfolios against stock market or interest rate movements.
Insurance companies	• Take positions in futures contracts to hedge their portfolios against stock market or interest rate movements.

Valuation of Financial Futures

- Futures contract price related to the price of the underlying asset
- Inverse relationship between debt contract prices and interest rates applies to futures prices
- Futures contract price reflects the expected price of the underlying asset or index as of the settlement date
- Anything that affects the price of the underlying asset affects the futures price
- Impact of opportunity costs or benefits

Potential Payoffs in Financial Futures





Speculating with Interest Rate Futures

- Forecasts that interest rates will decrease
  - Value of T-bills should increase
- Buy a T-Bill futures contract (94.00 a 6 percent discount)
- T-bill futures represent $1 million of par value
- **1.** T-Bill price on Marche settlement date is 94.90 (5.1 percent discount)
- Investor can accept delivery of the T-bills and sell them for more than he paid for them.

Speculating with Interest Rate Futures

- **2.** T-Bill price on Marche settlement date is 92.50 (7.5 percent discount)

Impact of Leverage

- Use a margin account
  - Return should reflect the degree of financial leverage

EXAMPLE I: SPECULATING IN GOLD FUTURES

- You believe the price of gold will go **up**. So,
  - You go **long** 100 futures contract that expires in 3 months.
  - The futures price today is **$400** per ounce.
  - There are 100 ounces of gold in each futures contract.
- Your "position value" is: $400 X 100 X 100 = $4,000,000
- Suppose your belief is correct, and the price of gold is **$420** when the futures contract expires.
- Your "position value" is now: $420 X 100 X 100 = $4,200,000

Your "long" speculation has resulted in a gain of $200,000

Using Interest Rate Futures to Create a Short Hedge – Financial Institutions usage

- Hedger adversely affected by an interest rate increase
  - Bank using primarily short-term funds to finance longer-term assets
  - Hurt by rising rates; must refinance funding before investment re-priced

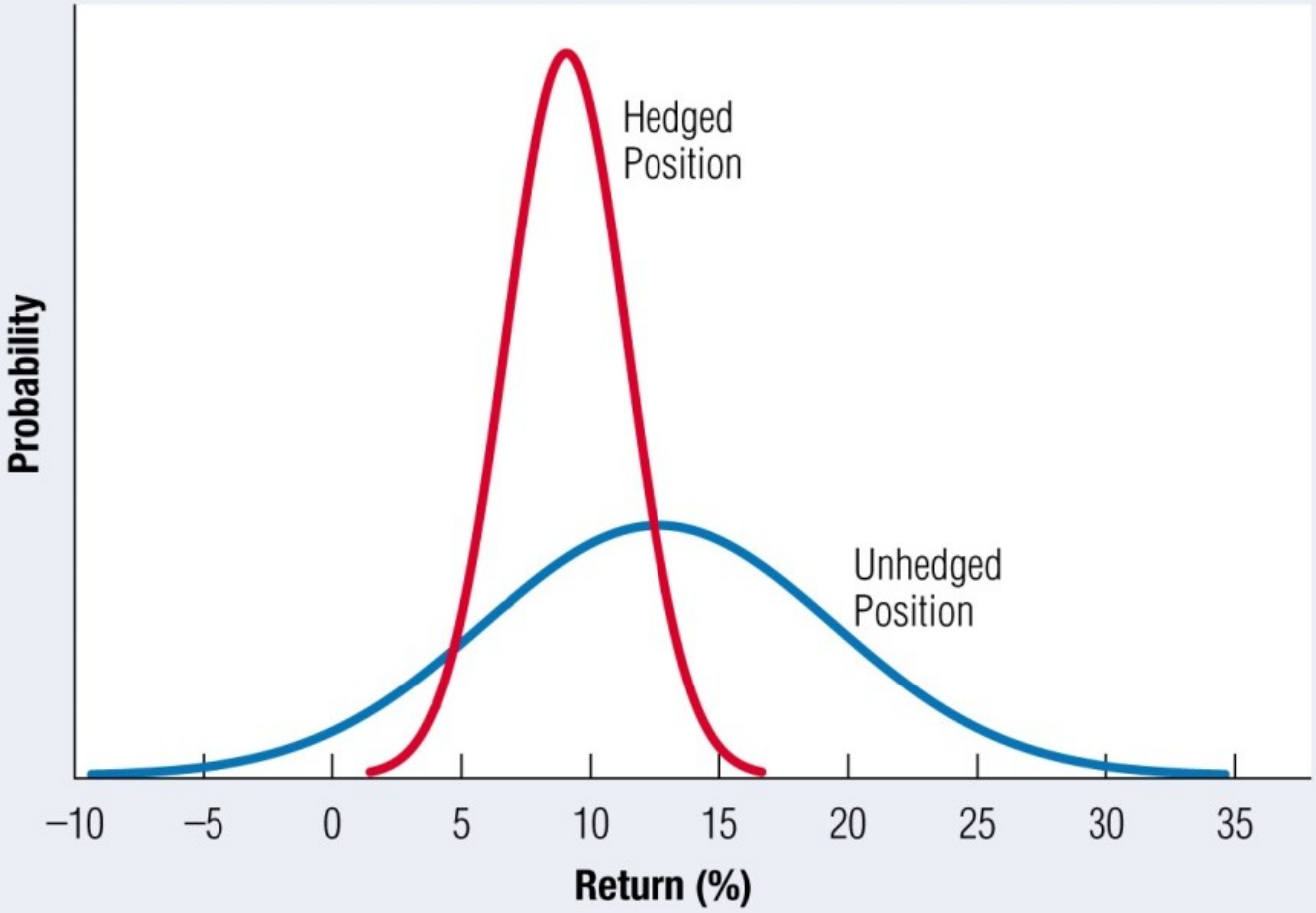
Using Interest Rate Futures to Create a Short Hedge

- The short hedge
- Sell futures contracts with characteristics similar to the securities being hedged
- If rates increase, hedger closes out the position at a profit in the futures market to offset spot market position opportunity loss (reduced interest margin)
- If rates decrease, hedger's spot market gains (wider interest margin) offset by losses on the futures position

Hedging with Interest Rate Futures

- Interest rate risk exposure
  - Classification of assets and liabilities according to their sensitivity of their market value

Probability Distribution od Returns



Using Interest Rate Futures to Create a Long Hedge

- Examples of adverse effects of a decrease in interest rates
  - Plan to purchase debt securities in a few months and if rates decline, the purchase price of bonds increases—long futures position locks in price of bonds
  - Bank finances loans whose rates adjust every six months with CDs that have a two-year term—long futures position locks in loan rates to maintain spread
- Hedger uses futures position to offset spot losses and gains—locks in a price or spread

Hedging net exposure

- Futures hedges have transaction costs
- Net exposure is the difference between asset and liability positions

Stock Index Futures

- Types of index futures contracts
  - Several different index contracts traded on the Chicago Board of Trade and Chicago Mercantile Exchange
  - Securities underlying the contract not deliverable-- cash settlement
  - Contract's price is the index times the dollar value given in the contract's specifications
  - For example, Chicago Merc S&P contract is the index value times $250

Stock Index Futures Contracts

Exhibit 13.7 Stock Index Futures Contracts

TYPE OF STOCK INDEX FUTURES CONTRACT	CONTRACT IS VALUED AS
S&P 500 index	$250 times index
Mini S&P 500 index	$50 times index
S&P Midcap 400 index	$500 times index
S&P Small Cap index	$200 times index
Nasdaq 100 index	$100 times index
Mini Nasdaq 100 index	$20 times index
Mini Nasdaq Composite index	$20 times index
Russell 2000 index	$500 times index
Nikkei (Japan) 225 index	$5 times index

Stock Index Futures

- Value of futures contract highly correlated with the value of the underlying index
- Differences or advantages and disadvantages to owning the actual index versus futures
- Under some circumstances, arbitrage profits are possible
- Indicators monitored by the market include anything affecting the underlying index

Stock Index Futures

- Speculating with stock index futures
  - Capitalize on expectations without having sufficient cash to buy the actual stocks in index
  - Expect an increase in stock prices, buy index futures; gain/losses leveraged with small investment
- Hedging with stock index futures
  - Hedge market risk of an existing portfolio
  - Pension fund manager with reasonable return for year sells index futures contracts to lock in return

Stock Index Futures

- Hedging issues
  - Hedge is more effective if investor's portfolio is diversified like the underlying index for the futures contract
  - Portfolio managers do not necessarily hedge the entire portfolio

Stock Index Futures

- Circuit breakers on stock index futures
  - Suspends trading on specific stocks or stock indexes after a specified market decline
  - Gives investors a chance to evaluate information or meet margin calls before trading resumes
  - Impacts program trading which has been linked to market volatility

Risk of Trading Futures Contracts

- Market risk
  - Speculators win or lose based on changing market value of futures contracts
  - Hedgers, with a position in the underlying asset, are not significantly impacted by contract price volatility
- Basis risk
  - Futures contract prices do not vary in exactly the same way as the underlying asset's price
  - Price correlation of contract and underlying asset impacts the ability to hedge market risk

Risk of Trading Futures Contracts

- Dealing with basis risk
  - Identify futures contract with price changes closely related to the underlying asset
  - Cross hedging involves using a futures contract with an underlying asset different from the asset to hedge, for example, hedge commercial paper rate exposure with T-bills futures
- Liquidity risk
  - Price distortions if a contract is not widely traded
  - Need a counterparty to close position

Risk of Trading Futures Contracts

- Credit risk
  - Counterparty defaults
  - Not a risk on exchange-traded contracts where exchange serves as the counter-party
- Prepayment risk
  - Assets (e.g. loans) prepaid sooner than their designated maturity
  - Leaves hedger without an offsetting spot position in a speculative position

Risk of Trading Futures Contracts

- Operational risk
  - Inadequate management or controls
  - For example, hedging firm's employees do not understand how futures contract values respond to market conditions