Ch 1 Introduction

derivative - financial instrument whose value depends on the values of more underlying variables

Exchange-Traded Markets

derivatives exchange - market where individuals trade standardized contracts defined by the exchange

Over-the-Counter Markets

- banks often act as market makers for the more commonly traded instruments
  – prepared to quote a bid price or an offer price
- OTC market has fewer transactions per year but greater transaction size compared to exchange-traded market
  – OTC market is much larger than exchange-traded market

Forward Contracts

forward contract - agreement to buy or sell an asset at a certain future time for a certain price
spot contract - agreement to buy or sell an asset almost immediately

- forward contract is traded in the OTC market
  – one party assumes long position, agreeing to buy underlying asset on a certain specified future date for a certain specified price
  – other party assumes short position, agreeing to sell asset on same date for same price

Given delivery price K and spot price of asset at maturity of contract S_T:
payoff from long position in forward contract is $S_T - K$
payoff from short position in forward contract is $K - S_T$

Futures Contracts

futures contract - agreement between two parties to buy or sell an asset at a certain time in the future for a certain price

- normally traded on an exchange

Options

- options are traded both on exchanges and in the OTC market

call option - gives holder right to buy underlying asset by a certain date for a certain price
put option - gives holder right to sell underlying asset by a certain date for a certain price

exercise (strike) price - price in the contract
expiration (maturity) date - date in the contract

American option - can be exercised at any time up to the expiration date
European option - can be exercised only on the expiration date

- most options traded on exchanges are American options
- bid-offer spread on an option is usually greater than that on the underlying stock
  – depends on trading volume
- price of call option decreases as strike price increases
- price of put option increases as strike price increases
- both option types become more valuable as time to maturity increases

Types of Traders

- derivatives markets have been successful due to attracting many types of traders and because they have high liquidity
- three broad categories of traders
  – **hedgers** use derivatives to reduce risk they face from potential future movements in a market variable
  – **speculators** use them to bet on future direction of a market variable
  – **arbitrageurs** take offsetting positions in two or more instruments to lock in a profit
- hedge funds play all three roles

Hedgers

Hedging using Forward Contracts

- can hedge FX risk by buying GBP in the forward market if expecting to pay GBP on a later date
- can hedge FX risk by selling GBP in the forward market if expecting to receive GBP on a later date
- purpose of hedging is to reduce risk

- no guarantee that the outcome of hedging will be better than the outcome without hedging

Hedging using Options

- investor can buy put option contracts on a company's stock if concerned about a possible share price decline

Hedging: Forwards vs Options

- key difference is that forwards are designed to neutralize risk by fixing the price the hedger will pay or receive for the underlying asset
- options provide insurance
  – offer a way for investors to protect themselves against adverse price movements in the future while still allowing them to benefit from favorable price movements
  – options involve payment of an up-front fee

Speculators

- speculators wish to take a position in the market
  – betting price of an asset goes up or betting that it goes down

Speculation using Futures

- can take long position in futures contracts instead of buying in the spot market
- futures market allows speculator to obtain leverage
  – small initial outlay enables large speculative position

Speculation using Options

- can buy call options instead of stock if expecting share price to rise
- options result in greater potential gain as well as greater potential loss
- options provide form of leverage, just like futures
  – use of options magnifies the financial consequences

Speculating: Futures vs Options

- both provide a way in which a type of leverage can be obtained
- when speculators use futures, the potential loss as well as potential gain is very large
- when speculators use options, the loss is limited to the amount paid for the options

Arbitrageurs

- arbitrage involves locking in a riskless profit by simultaneously entering into transactions in two or more markets

- arbitrage opportunities cannot last for long
  – as arbitrageurs buy, the forces of supply and demand will cause price to rise
  – as arbitrageurs sell, the forces of supply and demand will cause price to fall
  – the prices in different markets will become equivalent
- the existence of arbitrageurs ensures only small arbitrage opportunities are observed in prices quoted in financial markets

Dangers

- derivatives are very versatile instruments
  – traders who have a mandate to hedge risks or follow an arbitrage strategy can become speculators
- important to set up controls to ensure derivatives are being used for their intended purpose
  – risk limits should be set
  – activities of traders should be monitored daily to ensure that these risk limits are adhered to