BASICS OF DERIVATIVES

by ERUM
Risk

Goal of risk management: to maximize the value of the firm by reducing the negative potential impact of forces beyond the control of management.

Four basic approaches to risk management: risk avoidance, risk retention, loss prevention and control, and risk transfer.
Derivatives - financial instruments whose value depends on/derives from some underlying variable (asset).

- Used for changing the risk exposure.

- Hedging
  When the firm reduces its risk exposure with the use of derivatives, it is said to be hedging.
● Derivatives as a leveraging tool.

● It’s increased use for speculation.

● Word of Caution: Barrings Bank, Orange County, P&C, LTCM etc.
• Types of derivatives.
  Futures
  Forwards
  Options
  Swap
Forward contract

- an agreement to buy or sell an asset (of a specified quantity) at a certain future time for a certain price.
Futures

- Futures contracts are a variant of the forward contract that take place on financial exchanges.
Future v/s FORWARD

- the seller can choose to deliver the commodity on any day during the delivery month.
- futures contracts are traded on an exchange whereas forward contracts are generally traded off an exchange.
- the prices of futures contracts are marked to the market on a daily basis.
OPTIONS

- Options are special contractual arrangements giving the owner the right to buy or sell an asset at a fixed price anytime on or before a given date.

- they give the buyer the right, but not the obligation to exercise the contract.
Two types of options contract

- Call option
- Put option
CALL OPTIONS

- A call option gives the owner the right to buy an asset at a fixed price during a particular time period.

The Value of a Call Option at Expiration

- If the stock price is greater than the exercise price, we say that the call is in the money.

The payoff of a call option at expiration is

1. If Stock Price Is Greater Than Strike price
   Call-option value = Stock price - Strike price
• If Stock Price Is Lesser Than Strike Price, Call-option value = 0
Put Options

- a put gives the holder the right to sell the stock for a fixed exercise price.

The Value of a Put Option at Expiration
SELLING OPTIONS

- An investor who sells (or writes) a call on common stock promises to deliver shares of the common stock if required to do so by the call-option holder.
- The seller loses money if the stock price ends up above the exercise price and he merely avoids losing money if the stock price ends up below the exercise price.
- Why would the seller of a call place himself in such a precarious position?
sell-a-call
sell-a-put
VALUING OPTIONS

- determine the value of options when you buy them well before expiration.
- Bounding the Value of a Call

Arbitrage profit

Upper bound: It turns out that the upper boundary is the price of the underlying stock.
Upper and Lower Boundaries of Call-Option Values

Value of Call Prior to expiration date

Upper bound = Price of Stock

Lower bound = Price of Stock - Strike Price

Exercise Price = Value of Common Stock prior to expiration date

Value of the Call must lie in the region below the line.
The Factors Determining Call-Option Values

1) Exercise Price
2) Expiration Date
3) Stock Price
4) The Key Factor: The Variability of the Underlying Asset
Probability

Strike Price

Price of Common Stock at expiration

B

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Factors Determining Put-Option Values

1. The put’s market value decreases as the stock price increases
2. The value of a put with a high exercise price is greater than the value of an otherwise identical put with a low exercise price
4. The value of a put with a distant expiration date is greater
5. Volatility of the underlying stock increases the value of the put.
SWAPS CONTRACTS

- Swaps are arrangements between two counterparts to exchange cash flows over time.
- Two basic types are interest-rate swaps and currency swaps.
Currency swaps

- Currency swaps are swaps of obligations to pay cash flows in one currency for obligations to pay in another currency.