Lecture #4

OPTIONS

Few headlines:
AIG Loses - $100 Billion - Massive Government Bailout (Sep 08)
Goldman Sachs / Paulson & Co Hedge Fund

USE OPTIONS FOR INSURANCE / PROTECTING / HEDGING – RESPONIBLE RISK MANAGER

CALL OPTIONS

The right to purchase an asset for a specific price (exercise price or strike price) on or before some specified expiration

i.e. March Call OPTION for IBM stock with exercise price of $100 entitles its owner to **PURCHASE** IBM stock for $100 at any time up to and including the expiration S=Day in March (third Friday). The purchase price option is called **PREMIUM** (like insurance) - the seller that owns the stock receives the premium

EXAMPLE 15.1 – Call 3/20 third Friday of the Month (MARCH 2010) Call option IBM $100 with Premium for $2.80

Until March 20, the holder of the option may buy the stock (10 shares per option) for $100. On February 6, IBM sells for $96.14 – Not a good time to exercise – If IBM is selling at $102 on March 20 – The option will be exercised (even though you will loose money – but not as much as not exercising)
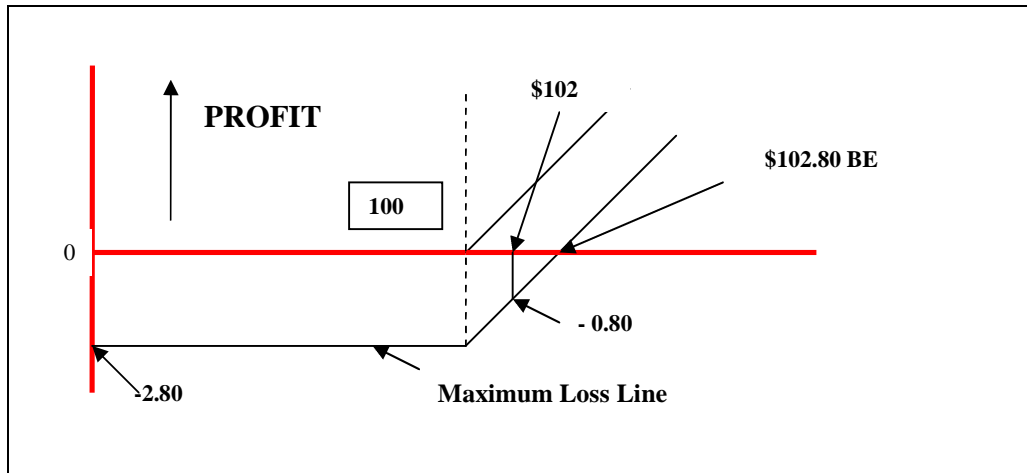
102 – Buy 100 = $2

Profit = Final Value – Original Investment = 2- 2.80 = -.80

CALL OPTION:

PUT OPTIONS

Gives the holder the right to <u>SELL</u> an Asset for a specific exercise or stock price on or before a specific date (exercise date)

i.e. MARCH $100 - Sell IBM at $100 even if the stock price less than $100 – The owner of the PUT option does not need to own the shares to exercise the option

Example 15.2 PUT

PUT OPTION w/ exercise price $100 sell on 2/6/10 for $6.47. Entitles the owner of the option to sell IBM shares at any time, until March 20, to sell the stock at $100

If price on 2/6/10 is $96.14 – an immediate exercise will loose money – wait until the expiration date March 20 – If March 20, the price of the IBM stock is $92, then you exercise the option – buying the stock at $100 and sell it at $92

$100 – 92 = $8 gross profit
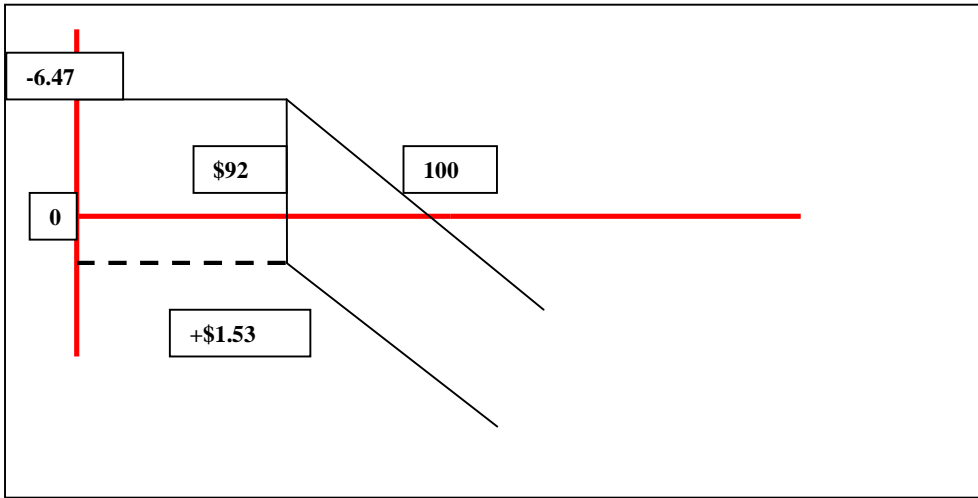$8 – 6.47 = $1.53 -----net profit of HPR of 1.53/6.47 = 23.6%

Other Terms: In-the money / Out-of the money (Before Premium) / on the money

American Option (on or before) / European Option (on expiration day)

PUT OPTION

-6.47		
	$92	100
0		
+$1.53		

4 STATEGIES

	Buy a CALL	Write a CALL	Buy a PUT	Write a PUT
Expected Stock	UP	Stabilize / Sideways	DOWN	U or stable
Max Loss	Premium	Opportunity Cost	Premium	Exercise Price – Stock - Premium
		Must own the stock		

OPTIONS Vs Stock Investments - DECISIONS

3 STRATEGIES
A. Invest entirely in stock - Buy at $90 x 100 shares
B. Call Options - Buy 900 calls x $10
C Purchase 100 calls for $1000 and invest the difference in T-bills

Initial Investment = $9,000

Current Stock Price= $ 90.00

6-month Call Option= $ 10.00
Treasury Bill Rate =   2.00%

	QUANT				PRICE			
Stategies			**85.00**	**90.00**	**95.00**	**100.00**	**105.00**	**110.00**
A	100	Shares	8,500	9,000	9,500	10,000	10,500	11,000
B	900	Calls	-	-	4,500	9,000	13,500	18,000
C	100	Calls	8,160	8,160	8,660	9,160	9,660	10,160
PROFIT								
A	100	Shares	($500)	$0	$500	$1,000	$1,500	$2,000
B	900	Calls	($9,000)	($9,000)	($4,500)	$0	$4,500	$9,000
C	100	Calls	($840)	($840)	($340)	$160	$660	$1,160
HPR								
A	100	Shares	-5.56%	0.00%	5.56%	11.11%	16.67%	22.22%
B	900	Calls	- 100.00%	- 100.00%	-50.00%	0.00%	50.00%	100.00%
C	100	Calls	-9.33%	-9.33%	-3.78%	1.78%	7.33%	12.89%

PROTECTIVE PUT

Hedging strategy

Investing in stock and purchasing a Put option on the stock

i.e. Suppose the strike price is $90 ans the stock is selling for $87 at expiration day –
the value of your stock in your portfolio is $90. The right to sell the stock at $90
The stock is worth $87 – You sell it at the option price at $90 then your profit is

X – St = $90 - $87 = $3

if the price of the stock is S=90 = you get $90
if S = 94 then S>94 = the option at 90 is worthless, but you own the stock

Payoff to protective PUT strategy

	St <= X	**St > X**
Stock	St	St
Put Option	X – St	0
Total	X	St

Despite the common perception that Derivative means Risk – these can be used effectively for risk management – Brane Vs Roth – responsibility to hedge Grain held in storage – failed to hedge – lawsuit was one because manager failed to use to secure the risk by hedging.

COVERED CALLS

Is the purchase of Share of Stock with simultaneous sale of a Call on the stock. The option is "covered" because the potential obligation to deliver the stock is covered by the stock hled in the portfolio.

NOTE: Writing an option without affecting the stock is called "naked option writing"

	St <= X	**St > X**
Payoff of Stock	St	St
Payoff of Call Option	- 0	-(St – X)
Total	St	X

i.e.

Assume you hold 1,000 shares of GXX stock at $130 per share. You intent to sell the stock if it hits $140 per share – so you write a call for 90 days receiving $5 premium at the X=$140.

Write 10 GXX (1,000 shares) you get $5,000. If the stock goes to $140.1 – the stock will be exercised getting $140-130 = $10 + $5 premium – the only risk is if the stock will increase beyond $140 and you lost the opportunity to sell it higher than $140, but you were going to sell it at $130 anyway…

STRADDLE

A long <u>straddle</u> is established by <u>BUYING A CALL</u> and <u>A PUT</u> on a stock each with the same X price and same Expiration Date. The view is Volatility – If the investor is expecting that the stock will swing significantly up or significantly down based on news (FDA drug, Court Decision, etc).
The worse case scenario for straddle is no movement in the stock – max loss is the premium on both PUT and CALLS

	$St <= X$	$St > X$
Payoff of CALL	0	$St - X$
Payoff of PUT	$(X - St)$	$+0$
Total	$X - St$	$St - X$

SPREADS

A spread is a combination of two or more CALL options (or PUT Options) on the same stock with different exercise prices or times of expirations.

Money Spread: Purchases/sell of options of different X prices
Time Spread: Purchases/sell of options of different Expiration Times

	$St <= X1$	$X1<St<X2$	$St>X2$
Payoff of CALL X1	0	$St - X1$	$St - X1$
Payoff of CALL X2	-0	-0	$-(St - X2)$
Total	0	$Sr - X1$	$X2 - X1$

COLLARS

A collar is an option strategy that brackets the value of the portfolio between two bounds

i.e.

Suppose the investor is holding a large position of Eagle Corp. –

Current Price = $70

A lower bound of $60 can be place or the value of the portfolio by buying protection put with X = $60 – pay premium. To raise money to pay for the premium the investor rights a CALL at $80 – receives the same Premium (the same) = Net Zero premium.

OTHER NOTABLE OPTION LIKE SECURITIES

- Callable Bonds (Value of straight Vs Callable bonds)
- Convertible Securities (Value of stock vs Bonds)
- Warrants (attached Debt facilities – option to get equity stake)
- Leveraged Equity and Risky Debt (Assets instead of Equity stake for Debt holders)
- Exotic Options
- Asian Option – depending on Average (instead of final)
- Barrier Options – "down and out" – if the price drops passed the barrier causes the option to cancel even if the stock comes back within the expiration day
- Lookback Options – Based on minimum and maximum price
- Currency Translated Options – fix the exchange rate – when converted in US dollars.