Professor Chris Droussiotis

LECTURE 7

Options (Chapter 15)

DERIVATIVE MARKETS

Derive" from Derivatives – investments derived from prices of other securities – Contingent claim because their payoffs come from prices of other securities.

USE both for Hedging and Speculation

- Options
- Futures
- Swaps

Buying an Option on a House Example: Thinking on buying a house that is listed for \$100,000. If you like the price you must lock in. But you need more time to look at other houses, so you approach the owner and sign an agreement with option to buy at \$100,000 within 2 months and pay for that option (let's say 2.0% or \$2,000). YOU HAVE THE RIGHT TO BUY NOT THE OBLIGATION.

OPTIONS

<u>Few headlines</u>: 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 **<u>PURCHASE</u>** 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

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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

BASIC OPTION STRATEGIES

			Calls						Puts					
4	Х		July		Aug		Oct			July		Aug		Oct
5	165	\$	2.50	\$	5.00	\$	7.90		\$	2.15	\$	4.65	\$	6.50
6	170	\$	0.75	\$	3.15	\$	5.65		\$	5.60	\$	7.10	\$	8.75
7														
8	Current Price													
9	\$ 165.13													



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

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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%

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

									Calls							Puts		
4		Х				Ju	ıly		Aug		Oct		Ju	ly		Aug		Oct
5		165				\$	2.50	\$	5.00	\$	7.90		\$ 3	2.15	\$	4.65	\$	6.50
6		170				\$	0.75	\$	3.15	\$	5.65		\$!	5.60	\$	7.10	\$	8.75
7																		
8	Curre	ent Price																
9	\$	165.13																
Exam	ple 2 (B	uying a Put	Op	tion)														
														_				
		S0=	\$	165.13														
		X =	\$	165.00														
F	urchase	P =	\$	6.50	(Octo	ober)												
Stoc	k Price (S)	Exercise Price (X)		Payoff (X - S)	P	rofit (π)	HPR (9	%)	\$20.00		0	ctc	ber 16	65 Put	:			
\$	150.00	\$ 165.00	\$	15.00	\$	8.50		131%	Ć15.00									
\$	155.00	\$ 165.00	\$	10.00	\$	3.50		54%	\$15.00									
\$	160.00	\$ 165.00	\$	5.00	\$	(1.50)		-23%	\$10.00			+						- 1
\$	165.00	\$ 165.00	\$	-	\$	(6.50)	-	100%	\$5.00									_
\$	170.00	\$ 165.00	\$	-	\$	(6.50)	-	100%	_									
Ş	1/5.00	\$ 165.00	Ş	-	Ş	(6.50)	-	100%	\$- \$1/15 (0 \$150.0	0 \$155.00 \$1		0 \$165	00 \$17	0.00	\$175.00 \$180	00	\$185.00
Ş	180.00	Ş 105.00	Ş	-	Ş	(0.50)	-	100%	\$(5.00)	50 \$150.0	0 9135.00 91		JU 3105	.00 917	0.00	Ş175.00 Ş10		Ş185.00
		Break Even =	\$	158.50	Stock	price			¢(10.00)								1	
		Max Gain=	\$	158.50	per s	hare			\$(IU.UU)									_
		Max Loss=	\$	6.50	per s	hare						- F	Payoff –	Profi	t			

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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		

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	Х	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.

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EXAMPLE

Exa	mple 4 (P	rotective Pu	uts)					
Stra	ategy:	Owning or Bu	uying the sto	ock				
		Buying Put O	ptions					
Pur	pose:	To protect yo	our holdings	of the stock fo	r any declines			
		S0=	\$ 165.13					
		X =	\$ 170.00					
Bu		P =	\$ 8.75	(October)	One contract =	100 shares		
Purchas		ased Shares=	. 100	,				
Purchased Shar								
			OPTIONS			STOCK		
				Line and the second				Total
C+	a als Duian	Exercise	Oncovered	Uncovered	Oncovered	Proceeds	Profit	Profit
St		Price	Options	Options	Options	from	from	from
	(5)	(X)		Profit	Profit	Stock	Stock	Protective
			(S - X)	(π)	(π) x 100			Put
\$	150.00	\$ 170.00	\$ 20.00	\$ 11.25	\$ 1,125	\$ 15.000	\$ (1,513)	\$ (388)
\$		•		+	. ,	+ == / = = =		
	155.00	\$ 170.00	\$ 15.00	\$ 6.25	\$ 625	\$ 15,500	\$ (1,013)	\$ (388)
\$	155.00 160.00	\$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00	\$ 6.25 \$ 1.25	\$ 625 \$ 125	\$ 15,500 \$ 16,000	\$ (1,013) \$ (513)	\$ (388) \$ (388)
\$ \$	155.00 160.00 165.00	\$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00	\$ 6.25 \$ 1.25 \$ (3.75)	\$ 625 \$ 125 \$ (375)	\$ 15,500 \$ 16,000 \$ 16,500	\$ (1,013) \$ (513) \$ (13)	\$ (388) \$ (388) \$ (388)
\$ \$ \$	155.00 160.00 165.00 170.00	 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 	\$ 15.00 \$ 10.00 \$ 5.00 \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875)	\$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000	\$ (1,013) \$ (513) \$ (13) \$ 487	\$ (388) \$ (388) \$ (388) \$ (388)
\$ \$ \$ \$	155.00 160.00 165.00 170.00 175.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875)	\$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500	\$ (1,013) \$ (513) \$ (13) \$ 487 \$ 987	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ 112
\$ \$ \$ \$ \$ \$	155.00 160.00 165.00 170.00 175.00 180.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875) \$ (875)	\$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000	\$ (1,013) \$ (513) \$ (13) \$ 487 \$ 987 \$ 1,487	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (382) \$ (383)
\$ \$ \$ \$ \$	155.00 160.00 165.00 170.00 175.00 180.00 185.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875)	\$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000 \$ 18,500	\$ (1,013) \$ (513) \$ (13) \$ 487 \$ 987 \$ 1,487 \$ 1,987	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ 112 \$ 612 \$ 1,112
\$ \$ \$ \$ \$ \$ \$	155.00 160.00 165.00 170.00 175.00 180.00 185.00 190.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875)	\$ 15,500 \$ 16,500 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000 \$ 18,500 \$ 19,000	\$ (1,013) \$ (513) \$ (13) \$ 987 \$ 987 \$ 1,487 \$ 1,987 \$ 2,487	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (112) \$ 612 \$ 1,112 \$ 1,612
\$ \$ \$ \$ \$ \$	155.00 160.00 165.00 170.00 175.00 180.00 185.00 190.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$	\$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000 \$ 18,000 \$ 18,500 \$ 19,000	\$ (1,013) \$ (513) \$ (13) \$ 487 \$ 987 \$ 1,487 \$ 1,987 \$ 2,487	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (112) \$ 612 \$ 1,112 \$ 1,612
\$ \$ \$ \$ \$ \$	155.00 160.00 170.00 175.00 180.00 185.00 190.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875)	\$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000 \$ 18,500 \$ 18,500 \$ 19,000 BE on	\$ (1,013) \$ (513) \$ (13) \$ 987 \$ 987 \$ 1,487 \$ 1,987 \$ 2,487 BE on BE on	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (112) \$ 612 \$ 1,112 \$ 1,612
\$ \$ \$ \$ \$ \$	155.00 160.00 165.00 175.00 180.00 185.00 190.00 CF (0) \$	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ Max Gain	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875) \$ (875)	\$ 15,500 \$ 16,500 \$ 16,500 \$ 17,000 \$ 17,500 \$ 17,500 \$ 18,000 \$ 18,500 \$ 19,000 BE on option	\$ (1,013) \$ (513) \$ (13) \$ 987 \$ 987 \$ 1,487 \$ 1,987 \$ 2,487 BE on Protective	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (112) \$ 612 \$ 1,112 \$ 1,612
\$ \$ \$ \$ \$ \$ \$	155.00 160.00 170.00 175.00 180.00 185.00 190.00	\$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 170.00 \$ 400 \$ 170.00 \$ 170.00	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875)	\$ 15,500 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 17,500 \$ 18,000 \$ 18,000 \$ 18,000 \$ 18,000 \$ 19,000 BE on option	\$ (1,013) \$ (513) \$ (13) \$ 487 \$ 987 \$ 1,487 \$ 1,987 \$ 2,487 BE on Protective Put	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ 112 \$ 612 \$ 1,112 \$ 1,612
\$ \$ \$ \$ \$ \$ \$ \$ \$	155.00 160.00 170.00 175.00 180.00 185.00 190.00 CF (0) \$ (17,388)	\$ 170.00 \$ 170.	\$ 15.00 \$ 10.00 \$ 5.00 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	\$ 6.25 \$ 1.25 \$ (3.75) \$ (8.75) \$ (8.75)	\$ 625 \$ 125 \$ (375) \$ (875) \$ (875)	\$ 15,500 \$ 15,500 \$ 16,000 \$ 16,500 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000 \$ 18,000 \$ 18,000 \$ 18,000 \$ 18,000 \$ 18,000 \$ 19,000 BE on option \$ 161.25	\$ (1,013) \$ (513) \$ (13) \$ 487 \$ 987 \$ 1,487 \$ 1,987 \$ 2,487 BE on Protective Put \$ 173.88	\$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (388) \$ (112) \$ 612 \$ 1,112 \$ 1,612

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 held in the portfolio.

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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	Х

EXAMPLE:

Exar	nple 5 (C	ove	red Calls)											
Strat	egy:	Ow	ning or Bu	Jyin	g the sto	ck									
		Sell	ing (writi	ng)	Calls										
Purp	ose:	Inte	ent to sell	the	stock in	the	future								
			S 0 =	\$	165.13										
			X =	\$	170.00										
Se			C =	Ś	5.65	(00	tober)	One	contract =	10)0 shares				
Purc		ased	- Shares=	7	100	(,								
	i aren		- enaice		100										
				OP	TIONS						STOCK				
Sto	ck Price	E	kercise Price	Un O	covered Options	Uı	ncovered Options	Un C	covered options		Proceeds from	F	Profit from		Total Profit from
	(5)		(X)	ŀ	2ayoff (X - S)		Profit (π)	(т	Profit t) x 100		Stock	9	Stock	Co	overed Call
\$	(5)	\$	(X) 170.00	\$		\$	Profit (π) 5.65	(т \$	Profit t) x 100 565		Stock \$ 15,000	\$	5tock (1,513)	C (\$	overed Call (948)
\$ \$	(5) 150.00 155.00	\$ \$	(X) 170.00 170.00	\$ \$		\$ \$	Profit (π) 5.65 5.65	רז) (ד (ד	Profit t) x 100 565 565		Stock \$ 15,000 \$ 15,500	\$	5tock (1,513) (1,013)	C (\$ \$	Call (948) (448)
\$ \$ \$	(S) 150.00 155.00 160.00	\$ \$ \$	(X) 170.00 170.00 170.00	\$ \$ \$		\$ \$ \$	Profit (π) 5.65 5.65 5.65	(7 \$ \$ \$	Profit t) × 100 565 565 565		Stock \$ 15,000 \$ 15,500 \$ 16,000	\$ \$ \$	5tock (1,513) (1,013) (513)	C \$ \$ \$	Call (948) (448) 52
\$ \$ \$ \$	(S) 150.00 155.00 160.00 165.00	\$ \$ \$	(X) 170.00 170.00 170.00 170.00	\$ \$ \$ \$		\$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 5.65	(7 \$ \$ \$ \$	Profit t) x 100 565 565 565 565		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500	\$ \$ \$ \$	6tock (1,513) (1,013) (513) (13)	C \$ \$ \$ \$	Description Call (948) (448) 52 552
\$ \$ \$ \$	(5) 150.00 155.00 160.00 165.00 170.00	\$ \$ \$ \$ \$	(X) 170.00 170.00 170.00 170.00 170.00	\$ \$ \$ \$	- (X - S) 	\$ \$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 5.65	(7 \$ \$ \$ \$ \$	Profit t) × 100 565 565 565 565 565		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000	\$ \$ \$ \$ \$	(1,513) (1,013) (513) (13)	C \$ \$ \$ \$ \$	overed Call (948) (448) 52 552 1,052
\$ \$ \$ \$ \$ \$	(5) 150.00 155.00 160.00 165.00 170.00 175.00	\$ \$ \$ \$ \$ \$ \$	(X) 170.00 170.00 170.00 170.00 170.00	\$ \$ \$ \$ \$	- (X - S) 	\$ \$ \$ \$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 5.65 0.65	(7 \$ \$ \$ \$ \$ \$	Profit a) × 100 565 565 565 565 565 65		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500	\$ \$ \$ \$ \$ \$ \$ \$	5tock (1,513) (1,013) (513) (13) 487 987	\$ \$ \$ \$ \$ \$ \$ \$ \$	overed Call (948) (448) 552 1,052 1,052
\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(5) 150.00 155.00 160.00 165.00 170.00 175.00 180.00	\$ \$ \$ \$ \$	(X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00	\$ \$ \$ \$ \$ \$ \$ \$	- - - - - - (5.00) (10.00)	\$ \$ \$ \$ \$ \$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 5.65 0.65 (4.35)	(7 \$ \$ \$ \$ \$ \$ \$	Profit t) × 100 565 565 565 565 65 (435)		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(1,513) (1,013) (513) (13) 487 987 1,487	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Devered Call (948) (448) 522 5522 1,052 1,052 1,052
\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(5) 150.00 155.00 160.00 165.00 170.00 175.00 180.00 CF (0)	\$ \$ \$ \$ \$ \$ \$ \$	(X) 170.00 170.00 170.00 170.00 170.00 170.00 Max Gain	\$ \$ \$ \$ \$ \$ \$	(X - S) - - - (5.00) (10.00) Max Gain	\$ \$ \$ \$ \$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 0.65 0.65 (4.35) Max	(7 \$ \$ \$ \$ \$ \$	Profit c) x 100 565 565 565 565 65 (435) Max Loss		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000	\$ \$ \$ \$ \$ \$ \$ \$	(1,513) (1,013) (513) (13) 487 987 1,487	C \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Overed Call (948) (448) 552 1,052 1,052 1,052
\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(5) 150.00 155.00 160.00 165.00 175.00 175.00 180.00 CF (0) \$	\$ \$ \$ \$ \$ \$ \$ \$	(X) 170.00 170.00 170.00 170.00 170.00 170.00 Max Gain S	\$ \$ \$ \$ \$ \$ \$	(X - S) - - - (5.00) (10.00) Max Gain Stock	\$ \$ \$ \$ \$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 0.65 (4.35) Max Loss \$	(7 \$ \$ \$ \$ \$ \$	Profit t) × 100 565 565 565 565 65 (435) Max Loss Stock		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	5tock (1,513) (1,013) (513) (13) 487 987 1,487	C \$ \$ \$ \$ \$ \$ \$ \$	overed Call (948) (448) 552 1,052 1,052 1,052
\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(5) 150.00 155.00 160.00 165.00 175.00 175.00 175.00 (175.00 180.00 (17,078)	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(X) 170.00 170.00 170.00 170.00 170.00 170.00 Max Gain \$ 1,052	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	(X - S) - - - (5.00) (10.00) Max Gain Stock 170.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Profit (π) 5.65 5.65 5.65 5.65 0.65 (4.35) 4.35 Max Loss \$ (15,948)	(7 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Profit t) x 100 565 565 565 565 65 (435) Max Loss Stock 5.65		Stock \$ 15,000 \$ 15,500 \$ 16,000 \$ 16,500 \$ 17,000 \$ 17,500 \$ 18,000 BE \$ 159.48	\$ \$ \$ \$ \$ \$	5tock (1,513) (1,013) (513) (13) 487 987 1,487	\$ \$ \$ \$ \$ \$	Overed Call (948) (448) 552 1,052 1,052 1,052

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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 worst 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

Example 3 (S	trad	ldle)								
Strategy:	Buy	ing the C	all -	same ex	ercis	e price as	the	Put		
	Buy	ing the P	ut -	same exe	ercis	e as the Ca	all			
Purpose:	Bet	ting on Vo	olat	ility						
		S 0=		165.13						
		X =	\$	170.00						
Buy		C =	\$	5.65	(Oc	tober)	On	e contract =	100 shares	
Buy		P =	\$	8.75	(Oc	tober)	On	e contract =	100 shares	
Total Premiur	n Pa	id =	\$	14.40						
			OP	TIONS						
	E.	orcico	Uncovered Options Payoff		Un	covered	U	ncovered		
Stock Price (S)		Price	O F	ptions Payoff	C	Options Profit		Options Profit		
Stock Price (S)		Price (X)	C F	ptions Payoff (S - X)	C	Dptions Profit (π)		Options Profit (π) x 100		
Stock Price (S) \$ 140.00	\$	Price (X) 170.00	C F Ş	Pptions Payoff (S - X) 30.00	\$	Dptions Profit (π) 15.60	\$	<mark>Options Profit (π) x 100</mark> 1,560		
Stock Price (S) \$ 140.00 \$ 145.00	\$	Price (X) 170.00	0 	Options Payoff (S - X) 30.00 25.00	\$ \$	Detions Profit (π) 15.60 10.60	\$ \$	Options Profit (π) x 100 1,560 1,060		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 150.00	\$ \$ \$	Price (X) 170.00 170.00 170.00	0 \$ \$ \$	Options Payoff (S - X) 30.00 25.00 20.00	\$ \$ \$	Detions Profit (π) 15.60 10.60 5.60	\$ \$ \$	Options Profit (π) × 100 1,560 1,060 560		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00	\$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00	0 \$ \$ \$ \$	Petions Payoff (S - X) 30.00 25.00 20.00 15.00	\$ \$ \$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60	\$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 560 60		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 160.00	\$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00	C \$ \$ \$ \$ \$	Options Payoff (S - X) 30.00 25.00 20.00 15.00 10.00	\$ \$ \$ \$ \$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60 (4.40)	\$ \$ \$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 560 60 (440)		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 160.00 \$ 160.00	\$ \$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00	C S S S S S S S S	Options Payoff (S - X) 30.00 25.00 20.00 15.00 10.00 5.00	\$ \$ \$ \$ \$ \$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60 (4.40) (9.40)	\$\$ \$\$<	Options Profit (π) × 100 1,560 1,060 560 60 (440) (940)		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 160.00 \$ 165.00 \$ 170.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00	0 \$ \$ \$ \$ \$ \$ \$ \$	Options Payoff (S - X) 30.00 25.00 20.00 15.00 10.00 5.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60 (4.40) (9.40) (14.40)	\$\lambda\$ \$\lambda\$ <t< td=""><td>Options Profit (π) × 100 1,560 1,060 560 60 (440) (940) (1,440)</td><td></td><td></td></t<>	Options Profit (π) × 100 1,560 1,060 560 60 (440) (940) (1,440)		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 160.00 \$ 165.00 \$ 170.00 \$ 175.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00	S S	Options Payoff 2ayoff 30.00 25.00 20.00 15.00 10.00 5.00	\$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60 (4.40) (9.40) (9.40) (9.40)	\$\lambda\$ \$\lambda\$ <t< td=""><td>Options Profit (π) × 100 1,560 1,060 560 60 (440) (940) (1,440) (940)</td><td></td><td></td></t<>	Options Profit (π) × 100 1,560 1,060 560 60 (440) (940) (1,440) (940)		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 160.00 \$ 165.00 \$ 175.00 \$ 175.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00	O S \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Payoff 2ayoff 30.00 25.00 20.00 15.00 10.00 5.00 - 5.00	\$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60 (4.40) (9.40) (14.40) (9.40) (4.40)	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 560 60 (440) (940) (1,440) (940) (940) (440)		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 155.00 \$ 160.00 \$ 165.00 \$ 170.00 \$ 175.00 \$ 180.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00	\$ \$	Options Payoff 2ayoff 30.00 25.00 20.00 15.00 10.00 5.00 10.00 5.00 10.00	\$ \$	Detions Profit (π) 15.60 10.60 5.60 0.60 (4.40) (9.40) (14.40) (9.40) (4.40) 0.60	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 60 (440) (940) (1,440) (940) (440) (440)		
Stock Price (S) \$ 140.00 \$ \$ 145.00 \$ \$ 155.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 175.00 \$ \$ 175.00 \$ \$ 180.00 \$ \$ 180.00 \$	\$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Payoff 2ayoff 30.00 25.00 20.00 15.00 10.00 5.00 - 5.00 10.00 5.00 - 5.00 10.00 15.00 10.00	····································	Detions Profit (π) 15.60 10.60 5.60 (4.40) (9.40) (14.40) (9.40) (4.40) (9.40) (4.40) (9.60 5.60	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 60 (440) (940) (1,440) (940) (1,440) (940) (440) 60 560		
Stock Price (S) \$ 140.00 \$ \$ 145.00 \$ \$ 155.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 165.00 \$ \$ 175.00 \$ \$ 175.00 \$ \$ 185.00 \$ \$ 190.00 \$	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Payoff 2ayoff 30.00 25.00 20.00 15.00 5.00 - 5.00 10.00 5.00 20.00 0.00	\$ \$	Detions Profit (π) 15.60 10.60 5.60 (4.40) (9.40) (14.40) (9.40) (4.40) (9.40) (4.40) (5.60 5.60 10.60	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 60 (440) (940) (1,440) (940) (1,440) (940) (440) (0,00) (440) (0,00) (0,		
Stock Price (S) \$ 140.00 \$ 145.00 \$ 155.00 \$ 155.00 \$ 160.00 \$ 165.00 \$ 165.00 \$ 165.00 \$ 165.00 \$ 165.00 \$ 165.00 \$ 175.00 \$ 175.00 \$ 195.00 \$ 195.00 \$ 200.00	\$ \$	Price (X) 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00 170.00	C I \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Petions Payoff (s - X) 30.00 25.00 20.00 15.00 10.00 - 5.00 10.00 15.00 20.00 25.00 30.00	\$ \$	Detions Profit (π) 15.60 10.60 5.60 (4.40) (9.40) (14.40) (9.40) (4.40) (9.40) (4.40) (5.60 10.60 15.60	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Options Profit (π) × 100 1,560 1,060 560 (440) (940) (1,440) (940) (440) (560) (1,060) 1,060 1,060		

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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 = \$70A 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.

Example 6 (Collars)

Strategy:	Owning or Buying the stock
	Buying Put Options
	Selling (writing) Calls
Purpose:	Protect the downside by giving up he upside to reduce premiums

	S 0 =	\$	165.13		
	X =	\$	170.00		
Buy	P =	\$	8.75	(October)	One contract = 100 shares
Sell	C =	\$	5.65	(October)	shares
Paid	Dunchasad	\$	3.10		
	Shares=	100			

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				PUT	OPTION					
Stock Price (S)		Exercise Price (X)		Uncovered Options Payoff (X - S)		Ur	ncovered Options Profit (π)	Uncovered Options Profit (π) x 100		
\$	140.00	\$	170.00	\$	30.00	\$	21.25	\$	2,125	
\$	145.00	\$	170.00	\$	25.00	\$	16.25	\$	1,625	
\$	150.00	\$	170.00	\$	20.00	\$	11.25	\$	1,125	
\$	155.00	\$	170.00	\$	15.00	\$	6.25	\$	625	
\$	160.00	\$	170.00	\$	10.00	\$	1.25	\$	125	
\$	165.00	\$	170.00	\$	5.00	\$	(3.75)	\$	(375)	
\$	170.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	175.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	180.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	185.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	190.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	195.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	200.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	205.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	
\$	210.00	\$	170.00	\$	-	\$	(8.75)	\$	(875)	

CALL OPTION						OPTIONS COMBINED					
Uncovered Options Payoff (S - X)		Uncover ed Options Profit (π)		Uncovered Options Profit (π) x 100		Uncovered Options Payoff (S - X)		Uncovered Options Profit (π)		Uncovered Options Profit (π) x 100	
\$	-	\$	5.65	\$	565	\$	30.00	\$	26.90	\$	2,690
\$	-	\$	5.65	\$	565	\$	25.00	\$	21.90	\$	2,190
\$	-	\$	5.65	\$	565	\$	20.00	\$	16.90	\$	1,690
\$	-	\$	5.65	\$	565	\$	15.00	\$	11.90	\$	1,190
\$	-	\$	5.65	\$	565	\$	10.00	\$	6.90	\$	690
\$	-	\$	5.65	\$	565	\$	5.00	\$	1.90	\$	190
\$	-	\$	5.65	\$	565	\$	-	\$	(3.10)	\$	(310
\$	(5.00)	\$	0.65	\$	65	\$	(5.00)	\$	(8.10)	\$	(810
\$	(10.00)	\$	(4.35)	\$	(435)	\$	(10.00)	\$	(13.10)	\$	(1,310
\$	(15.00)	\$	(9.35)	\$	(935)	\$	(15.00)	\$	(18.10)	\$	(1,810
\$	(20.00)	\$	(14.35)	\$	(1,435)	\$	(20.00)	\$	(23.10)	\$	(2,310
\$	(25.00)	\$	(19.35)	\$	(1,935)	\$	(25.00)	\$	(28.10)	\$	(2,810
\$	(30.00)	\$	(24.35)	\$	(2,435)	\$	(30.00)	\$	(33.10)	\$	(3,310
\$	(35.00)	\$	(29.35)	\$	(2,935)	\$	(35.00)	\$	(38.10)	\$	(3,810
\$	(40.00)	\$	(34.35)	\$	(3,435)	\$	(40.00)	\$	(43.10)	\$	(4,310

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STC	ОСК					
				Total Profit		
Pr	oceeds	Profit				
	from	from		from		
	Stock	Stock		Covered		
				Call		
\$	14,000	\$ (2,513)		\$	177	
\$	14,500	\$ (2,013)		\$	177	
\$	15,000	\$ (1,513)		\$	177	
\$	15,500	\$ (1,013)		\$	177	
\$	16,000	\$ (513)		\$	177	
\$	16,500	\$ (13)		\$	177	
\$	17,000	\$ 487		\$	177	
\$	17,500	\$ 987		\$	177	
\$	18,000	\$ 1,487		\$	177	
\$	18,500	\$ 1,987		\$	177	
\$	19,000	\$ 2,487		\$	177	
\$	19,500	\$ 2,987		\$	177	
\$	20,000	\$ 3,487		\$	177	
\$	20,500	\$ 3,987		\$	177	
\$	21,000	\$ 4,487		\$	177	