



MONEY SPREADS (Vertical Spreads)					
<b>1. BULL SPREADS - USING CALLS (Call Bull Spread)</b>			<b>2. BEAR SPREADS - USING PUTS (Bear Put Spread)</b>		
Stock Price at X:	140.00		Stock Price at X:	110.00	
Strategy	Expected Moderate rise in the price of the stock		Strategy	Expected Decline in the price of the stock	
Date	June		Date	June	
Type	CALLS		Type	PUTS	
Shares	100		Shares	100	
Action	Purchase	Sell	Spread	Purchase	Sell
Exercise Price	125.00	130.00		130.00	125.00
Premiums	(13.50)	11.35	(2.15)	(14.25)	11.50
			(2.75)		(2.75)
	Spread	\$ amount	HPR%	Stock	
Payoff	5.00	\$ 500.00			
Profir/(Loss)	2.85	\$ 285.00	133%	140.00	
Max Loss	(2.15)	\$ (215.00)	-100%	125.00	<
Max Gain	2.85	\$ 285.00	133%	130.00	>
Break Even Stock	\$ -		0%	\$ 127.15	=
<b>3. BEAR SPREADS - USING CALLS (Bear Call Spread)</b>			<b>4. BULL SPREADS - USING PUTS (Bull Put Spread)</b>		
Stock Price at X:	140.00		Stock Price at X:	125.00	
Strategy	Expected Decline in the price of the stock Expect the option not to be exercised		Strategy	Expected Increase in the price of the stock Expect the option not to be exercised	
Date	June		Date	June	
Type	CALLS		Type	PUTS	
Shares	100		Shares	100	
Action	Purchase	Sell	Spread	Purchase	Sell
Exercise Price	130.00	125.00		125.00	130.00
Premiums	(11.35)	13.50	2.15 Credit	(11.50)	14.25
				2.75	Credit
	Spread	\$ amount	% Ch	Stock	
Payoff - Purchase	\$ 10.00				
Payoff - Sell	-\$ 15.00				
Net Payoff	-\$ 5.00	\$ (500.00)			
Profir/(Loss)	(2.85)	\$ (285.00)		140.00	
Max Loss	(2.85)	N/A		-	<
Max Gain	2.15	N/A		-	>
Break Even Stock				\$ 127.15	
	Spread	\$ amount	% Ch	Stock	
Payoff - Purchase	\$ 0.00				
Payoff - Sell	-\$ 5.00				
Net Payoff	-\$ 5.00				
Profir/(Loss)	2.75	\$ 275.00		125.00	
Max Loss	(2.25)	N/A			
Max Gain	2.75	N/A			
Break Even Stock				\$ 127.25	

OTHER MONEY SPREADS											
BUTTERFLY SPREADS - USING CALLS					BUTTERFLY SPREADS - USING PUTS						
Stock Price at X:	125.00					Stock Price at X:	125.00				
Strategy	No Volatility					Strategy	No Volatility				
Date	June					Date	June				
Type	CALL					Type	PUTS				
Shares	100					Shares	100				
Action	Purchase	Sell	Sell	Purchase	Spread	Action	Purchase	Sell	Sell	Purchase	Spread
Exercise Price	120.00	125.00	125.00	130.00		Exercise Price	120.00	125.00	125.00	130.00	
Premiums	(15.40)	13.50	13.50	(11.35)	0.25	Premiums	(9.25)	11.50	11.50	(14.25)	(0.50)
	Spread	\$ amount	% Ch	Stock			Spread	\$ amount	% Ch	Stock	
Payoff - Purchase	\$ 5.00					Payoff - Purchase	\$ 0.00				
Payoff - Sell	\$ 0.00					Payoff - Sell	\$ 0.00				
Payoff - Sell	\$ 0.00					Payoff - Sell	\$ 0.00				
Payoff - Purchase	\$ 0.00					Payoff - Purchase	\$ 5.00				
Net Payoff	\$ 5.00					Net Payoff	\$ 5.00				
Profir/(Loss)	5.25	\$ 525.00		140.00		Profir/(Loss)	4.50	\$ 450.00		125.00	
Max Loss	N/A	N/A		120.00 <		Max Loss	(0.50)	\$ (50.00)		120.00 <	
Max Gain	5.25	\$ 525.00		125.00 =		Max Gain	4.50	\$ 450.00		125.00 =	
BreakEven - Lower				N/A =		BreakEven - Lower				120.50 =	
BreakEven - Upper				N/A =		BreakEven - Upper				129.50 =	
BOX SPREADS OR LONG BOX											
Stock Price at X:	110.00										
Strategy	No Volatility										
Date	June										
Type	CALL/PUT										
Shares	100										
	Call Bull Spread			Put Bear Spread			Net				
Action	Purchase	Sell	Spread	Purchase	Sell	Spread	Spread				
Exercise Price	125.00	130.00		130.00	125.00	-					
Premiums	(13.50)	11.35	(2.15)	(14.25)	11.50	(2.75)	(4.90)				
	Spread	\$ amount	HPR%	Spread	\$ amount	% Ch	Spread	\$ amount	% Ch		
Payoff	5.00	\$ 500.00		5.00	\$ 500.00		10.00	\$ 1,000.00			
Profir/(Loss)	2.85	\$ 285.00	133%	2.25	\$ 225.00	82%	5.10	\$ 510.00	185%		

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.

OPTION VALUATION (Chapter 16)

INTRINSIC & TIME VALUES

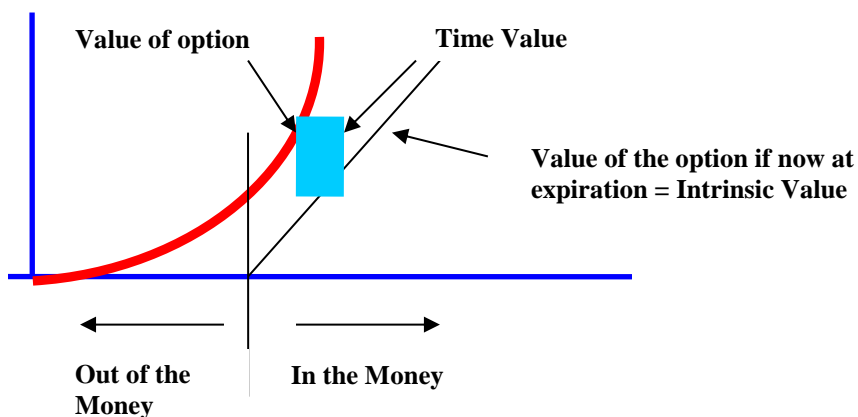
Consider a CALL option that is out of the money at the moment – which is stock below the exercise price – This does not mean that the value is Valueless.

There is always a chance that the stock will increase sufficiently by expiration date (or Zero value at Expiration day)

$$S - X = \text{Intrinsic value}$$

The difference between the Actual Call price and the value of the Intrinsic Value call Time Value of the option – It is the Volatility Value If not exercised the payoff cannot be less than Zero – As the price of the stock increases, the probability to be exercised is higher as it approaches the “adjusted” intrinsic value.

$$S - PV(x)$$



DETERMINING OF OPTION VALUE

Six factors that affect the value of Call option:

If the Value Increases		The Value of the Call Option
1. Stock Price	S	Increase
2. Exercise Price	X	Decrease
3. Volatility op the stock price	$\sigma$	Increase
4. The time to expiration	T	Increase
5. The interest rate	$r_f$	Increase
56. Dividend Value of the stock	D	Decrease

VOLATILITY IMPACT

Value \$10 and \$50 = average \$30

Value \$20 and \$40 = average \$30

Both have the same average, but the volatility on the first one is much higher. Suppose the exercise price is \$30.... Option Payoff? With 1 in 5 probability 0.2.

High Volatility Scenario

Stock Price	10	20	30	40	50
Option Payoff	0	0	0	10	20

Low Volatility Scenario

Stock Price	20	25	30	35	40
Option Payoff	0	0	0	5	10

High Volatility Average =  $(0+0+0+10+20)/5 = 6$

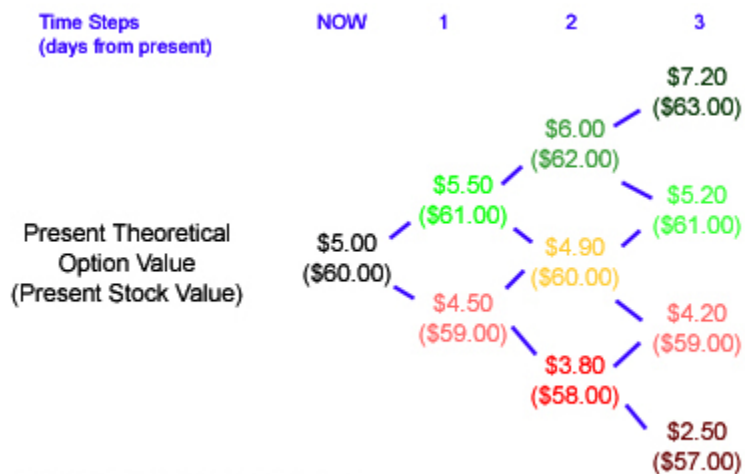
Low Volatility Average =  $(0+0+0+5+10)/5 = 3$

So it doesn't matter if its below \$30 (Zero value) – upside only volatility.

## BINOMIAL OPTION PRICING MODEL

Binomial Option Pricing Model (BOPM) was invented by Cox-Rubinstein in 1979. It was originally invented as a tool to explain the Black-Scholes Model to Cox's students. However, it soon became apparent that the binomial model is a more accurate pricing model for American Style Options. The binomial model is thus named as it returns 2 possibilities at any given time. Therefore, instead of assuming that an option trader will hold an option contract all the way to expiration like in the Black-Scholes Model, it calculates the value of that trader exercising that option contract with every possible future up and down moves on its underlying asset, reflecting its effects on the present value of that option, thus giving a more accurate theoretical price of an American Style option.

The binomial model produces a binomial distribution of all the possible paths that a stock price could take during the life of the option. A binomial distribution, or simply known as a "Binomial Tree", assumes that a stock can only increase or decrease in price all the way until the option expires and then maps it out in a "tree". Here is a simplified version of a binomial distribution just for illustration purpose :



It then fills in the theoretical value of that stock's options at each time step from the very bottom of the binomial tree all the way to the top where the final, present, theoretical value of a stock option is arrived. Any adjustments to stock prices at an ex-dividend date or option prices as a result of early exercise of American options are worked into the calculations at each specific time step .

### Advantage Of The Binomial Option Pricing Model

It can more accurately price American Style Options than the Black-Scholes Model as it takes into consideration the possibilities of early exercise and other factors like dividends.

### Disadvantage Of The Binomial Option Pricing Model

As it is much more complex than the Black-Scholes Model; it is slow and not useful for calculating thousands of option prices quickly.

Example:

#### BINOMIAL OPTION PRICING

Probability of direction of the stock up or down 50/50

Parameters	Current Stock Price	Probability (p)	Stock x p	Call Option Payoff if Exercised	Net after Repayment of Loan	Relationship between Payoff and Profit (leverage)	Value of the Call Option
Current Price=	\$ 100.00						\$ 6.06
Up probability (u) =		1.2	\$ 120.00	\$ 10.00	\$ 30.00	3.0x	
Down probability (d) =		0.9	\$ 90.00	\$ -	\$ -		
Range =			\$ 30.00				
Exercise Call Option =	\$ 110.00						
Exercise time =	1 year						
<b><u>Borrowing Parameters</u></b>							
Interest Rate =	10%						
Borrowed Amount (P) per share=	\$ 81.82						
Interest Amount per share =	\$ 8.18						
Total	\$ 90.00						
<b><u>Sources of Investment</u></b>							
Loan	\$ 81.82						
Cash (Equity)	\$ 18.18						
Total Sources	\$ 100.00						
<b><u>Fully Hedged Portfolio</u></b>							
Stock Price	90	120					
Obligations for 3 Calls	0	-30					
Payoff	90	90					