



Planning Option Trades

Everything You Need to Know!

CBOE[®]
CHICAGO BOARD OPTIONS EXCHANGE

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A Trading Quiz

Components of Option Prices

Option Price Behavior & the “Greeks”

Choosing the “Right” Option

Today is 7/1, 50 days to August expiration

	<u>Today</u>		<u>Forecast</u>
XSP	87.60	→	91.10
Days to Exp.	50	→	40
Aug 88 Call	3.70	→	?

Option pricing concepts:

Intrinsic value, time value, parity

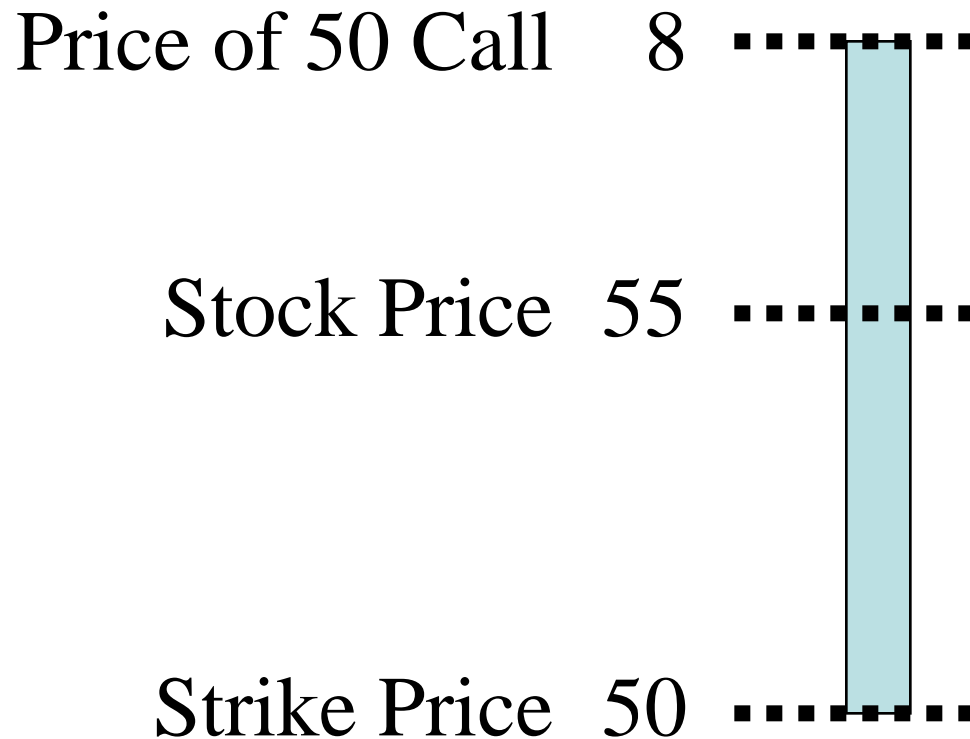
Impact of underlying price change

Impact of passing time

Volatility; what is it? What's the big deal?

Intrinsic value: the amount that an option is in the money.

Time value: the portion of an option's price in excess of intrinsic value.



Intrinsic Value & Time Value 2

Price of 60 Call 1.50 

Stock Price 55 

In-the-money: has intrinsic value

- For calls: stock price $>$ strike price
example: 80 Call with stock at \$85
- For puts: stock price $<$ strike price
example: 90 Put with stock at \$85

At-the-money:

stock price = strike price

examples: with stock at \$85:

85 Call is at-the-money

85 Put is at-the-money

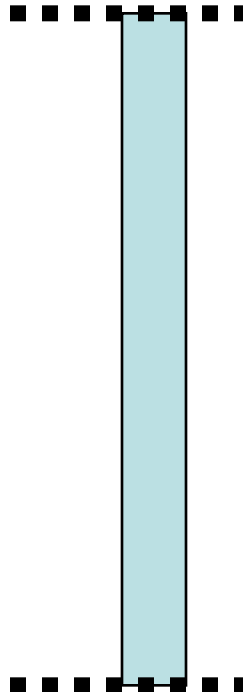
Out-of-the-money: no intrinsic value

- For calls: stock price < strike price
example: 90 Call with stock at \$85
- For puts: stock price < strike price
example: 80 Put with stock at \$85

Parity

Price of 50 Call = 8
& Stock Price = 58

Strike Price 50



Stock \$57.20	Intrinsic Value	Time Value	Premium	In- At- Out-
50 Call			8.90	
55 Call			5.75	
60 Call			3.50	
65 Call			1.95	
70 Call			1.05	

Stock \$57.20	Intrinsic Value	Time Value	Premium	In- At- Out-
50 Put			1.50	
55 Put			3.30	
60 Put			5.95	
65 Put			9.40	
70 Put			13.45	

Price of Stock

Strike Price

Time

Interest Rates

Dividends

Volatility

What other
financial instrument
has similar
components?

Components of Option Prices

Insurance Policy	Option
Price of Asset	
Deductible	
Time	
Interest Rates	
Level of Risk	
= PREMIUM	= PREMIUM

Concept 1: Delta

Underlying price up 1 point

→ Call up less than 1 point (put down less)

The symbol for delta is Δ (the Greek letter).

Deltas of calls are positive (from 0 to +1.00)

In-the-Money Calls delta +0.50 to +1.00

At-the-Money Calls delta \approx +0.50

Out-of-the-Money Calls delta 0 to +0.50

Deltas of puts are negative (from -1.00 to 0)

In-the-Money Puts delta -1.00 to -0.50

At-the-Money Puts delta \approx -0.50

Out-of-the-Money Puts delta $<$ -0.50 to 0

Examples of Delta

XSP 92.80

Days to Exp. 50

(50-day options)

DELTA

91 Call 4.10 +61%

93 Call 2.90 +51%

95 Call 1.95 +41%

97 Call 1.20 +32%

Gamma is the change in delta.

The absolute value of deltas increase as options go from O-O-M to I-T-M.

Positive gamma: deltas change in the same direction as the price change in the underlying.
“Stock up, delta up.” “Stock down, delta down.”

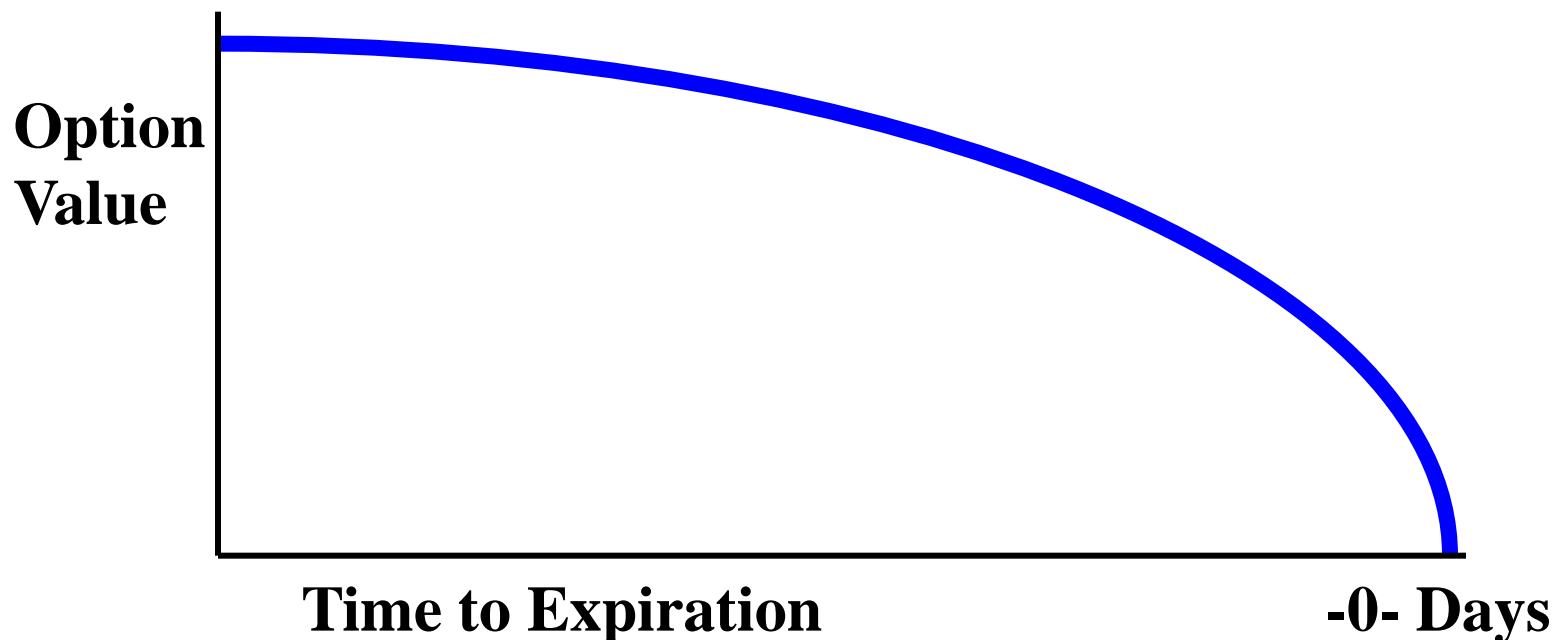
Long options have positive gamma.

Short options have negative gamma.

93 Call

<u>Index</u>	<u>Price</u>	<u>Delta</u>	<u>Gamma</u>
91.00	1.85	.40	.06
92.00	2.28	.46	.06
93.00	2.77	.52	.06
94.00	3.32	.58	.06
95.00	3.93	.63	.05

Concept #3 - Time Decay



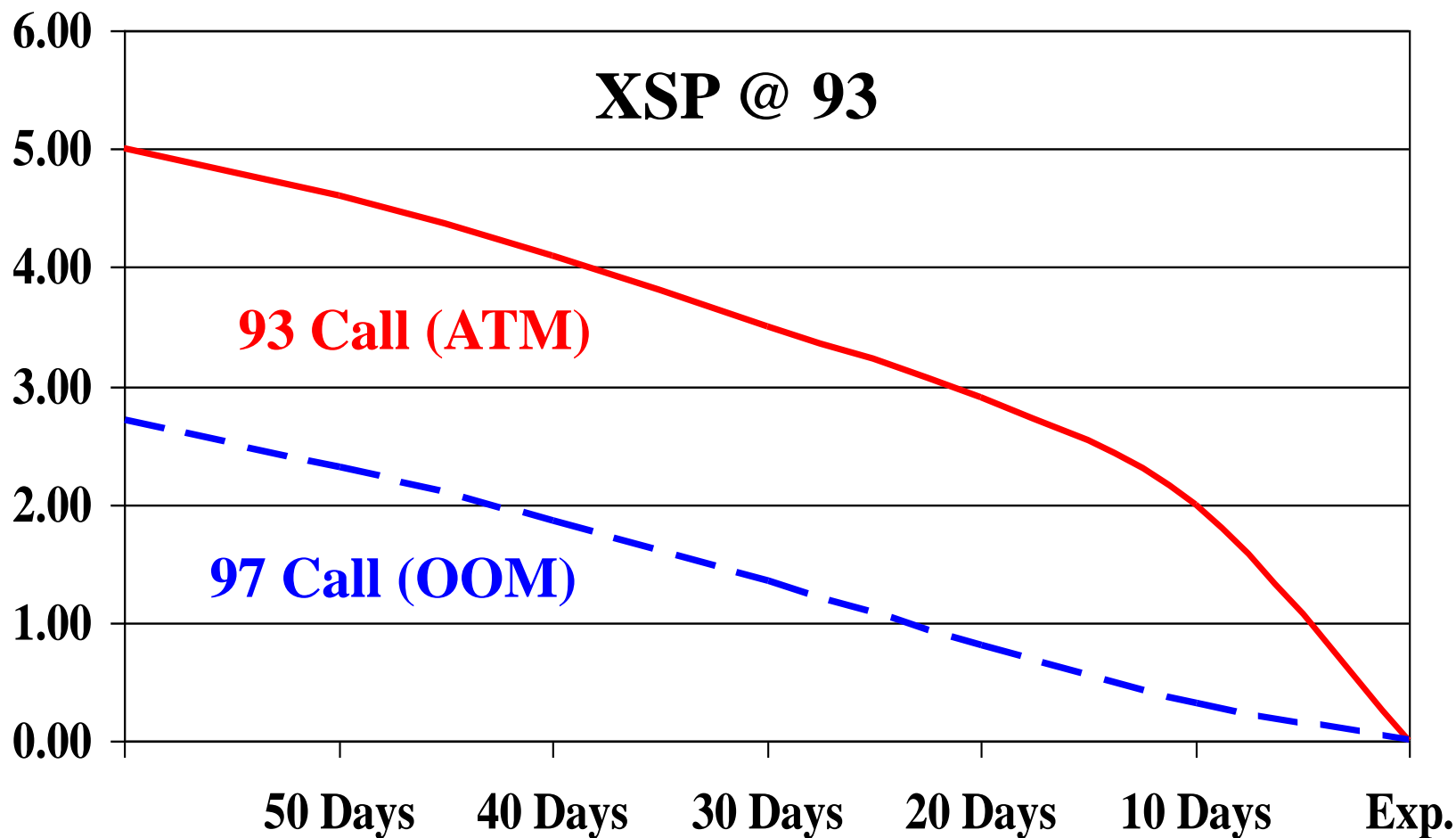
Options erode as time passes. Different options decrease in value at different rates. (In-, At-, Out-)

Time Decay for Different Strikes

Options decrease in value over time. XSP at 93.00

Call	50	40	30	20	10	
<u>Strike</u>	<u>Days</u>	<u>Days</u>	<u>Days</u>	<u>Days</u>	<u>Days</u>	<u>Exp.</u>
91	4.22	3.90	3.54	3.12	2.61	2.00
93	3.14	2.80	2.43	1.98	1.40	0.00
95	2.27	1.94	1.58	1.15	0.63	0.00
97	1.59	1.29	0.97	0.61	0.23	0.00

Time Decay – A-T-M vs. O-O-M



A-T-M options decay less initially and more as expiration approaches.

O-O-M options decay in a more linear fashion (least erosion near expiration).

Time Decay - Theta

XSP Index	92.80	7-Day Theta		
Days to Exp.	50			
<u>Strike</u>	<u>Call</u>	<u>Theta</u>	<u>Put</u>	<u>Theta</u>
91	4.10	-.22	2.20	-.21
93	2.90	-.22	3.00	-.21
95	1.95	-.21	4.15	-.20
97	1.20	-.17	5.30	-.16

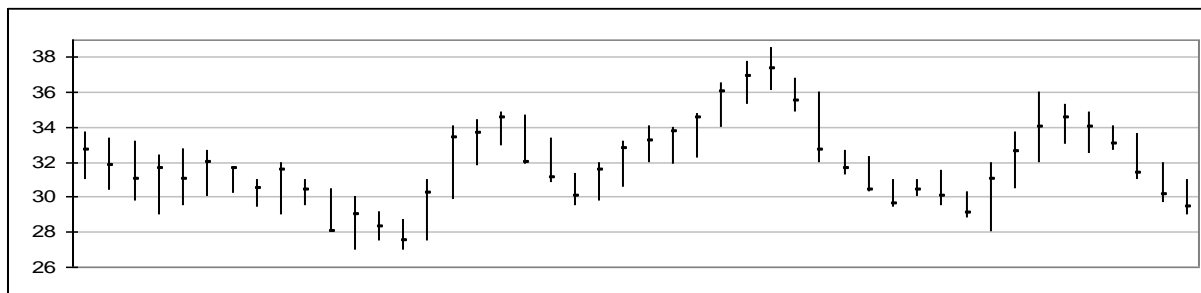
Option prices depend on the level of volatility.

Historical volatility – a measure of the past fluctuations in a stock's price.

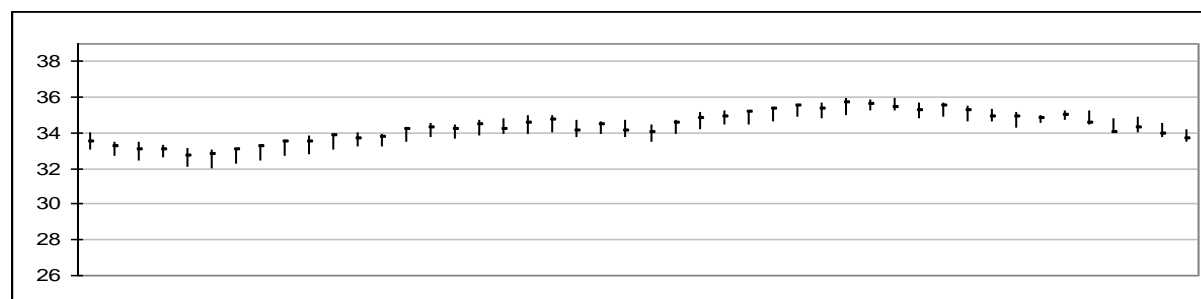
Implied volatility – the volatility percentage that justifies the current market price of an option.

Price action of the stock in the past

High
Volatility



Low
Volatility



Implied volatility is the volatility that is in the market price of an option.

Implied volatility is the market's forecast of the future volatility of the stock price.

Calculating an Option's "Value"

XSP Index	89.10	Theoretical Value
Strike Price	89	of 89 Call
Days to Exp	35	??
Interest Rates	0.7%	
Dividends	2.9%	
Volatility	22.0%	

Calculating the Implied Volatility **CBOE**[®]

XSP Index	89.10	Market Price of 89 Call 3.35
Strike Price	89	
Days to Exp	35	
Interest Rates	0.7%	
Dividends	2.9%	
Volatility	??	

Stock prices go through periods of high and low fluctuations. (historical volatility)

As a result, investors change their opinion about “option value.” (implied volatility)

Company/industry news

National/global news

Greed – Fear – Complacency

What Sometimes Happens

XSP Index	88.00	⇒	92.00
Strike Price	92.00		
Time	35 days	⇒	28 days
Interest Rates	1%		(1 wk passes)
Dividends	0%		
<u>Volatility</u>	<u>27%</u>	⇒	<u>15%</u>
92 Call Price	1.40	⇒	1.40

Three Thoughts on Volatility

#1

#2

#3

Day 1 - Open Trade

Stock Price



Strike Price

Days to Expiration



Int Rates & Div.

Implied Volatility



= **Mkt Price of Option**

Day 2 - Close Trade

Stock Price

Strike Price

Days to Expiration

Int Rates & Div

Implied Volatility

= **Mkt Price of Option**

Delta – change in an option’s theoretical value for a one-unit change in price of the underlying

Gamma – change in delta for a one-unit change in price of the underlying

Theta - change in an option’s theoretical value for a one-unit change in time to expiration.

Vega - change in an option’s theoretical value for a one-percent change in the volatility assumption.

Quiz 2 – Pick the “Best” Option

Today is 7/1, 50 days to August expiration

XSP 92.80 → 96.50

Days to Exp. 50 → 40

(50-day options)

91 Call 4.10 → ?

93 Call 2.90 → ?

95 Call 1.95 → ?

97 Call 1.20 → ?

Quiz 2 – Pick the “Best” Option

Today is 7/1, 50 days to August expiration

XSP 92.80 → 96.50

Days to Exp. 50 → 40

(50-day options)

91 Call 4.10 → 6.40 +2.30

93 Call 2.90 → 4.95 +2.05

95 Call 1.95 → 3.70 +1.75

97 Call 1.20 → 2.70 +1.50

Quiz 2 – Pick the “Best” Option

Today is 7/1, 50 days to August expiration

XSP 92.80 → 96.50

Days to Exp. 50 → 40

(50-day options)

91 Call 4.10 → 6.40 +2.30 + 56%

93 Call 2.90 → 4.95 +2.05 + 70%

95 Call 1.95 → 3.70 +1.75 + 90%

97 Call 1.20 → 2.70 +1.50 +125%

A Final Trading Quiz

18 days to expiration

XSP 84.10 → 87.00

Days to Exp. 18 → 8

84 Call 1.85 → ??

86 Call 1.02 → ??

88 Call 0.51 → ??

90 Call 0.23 → ??

A Final Trading Quiz - Answer

18 days to expiration

XSP **84.10** → **87.00**

Days to Exp. **18** → **8**

84 Call **1.85** → **3.28** **+1.43** + **77%**

86 Call **1.02** → **1.81** **+0.79** + **77%**

88 Call **0.51** → **0.82** **+0.31** + **61%**

90 Call **0.23** → **0.30** **+0.07** + **30%**

Today is 7/1, 50 days to August expiration

XSP 92.80 → 96.50

Days to Exp. 50 → 40

(50-day options)

91 Call 4.10 →

93 Call 2.90 →

95 Call 1.95 →

97 Call 1.20 →

Trade in units of capital –
not in the number of options.

Each alternative will have the same
maximum dollar risk (nearly).

Option prices change less than underlying prices. (delta concept)

Time decay is complicated.

Volatility changes.

Option traders need a 3-part forecast
(underlying price, time, volatility)

Manage capital to go for % profits.

THANK YOU FOR ATTENDING.

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ANSWERS

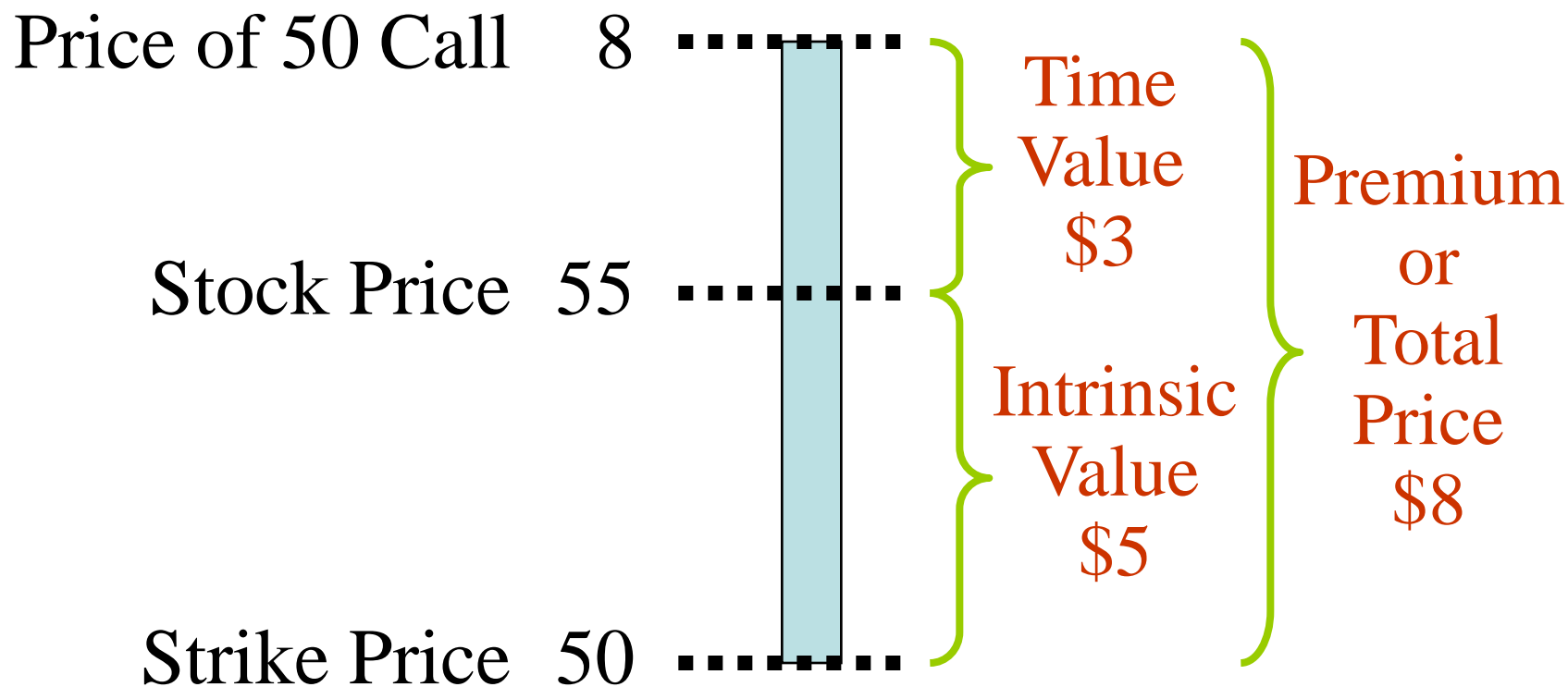


Planning Option Trades

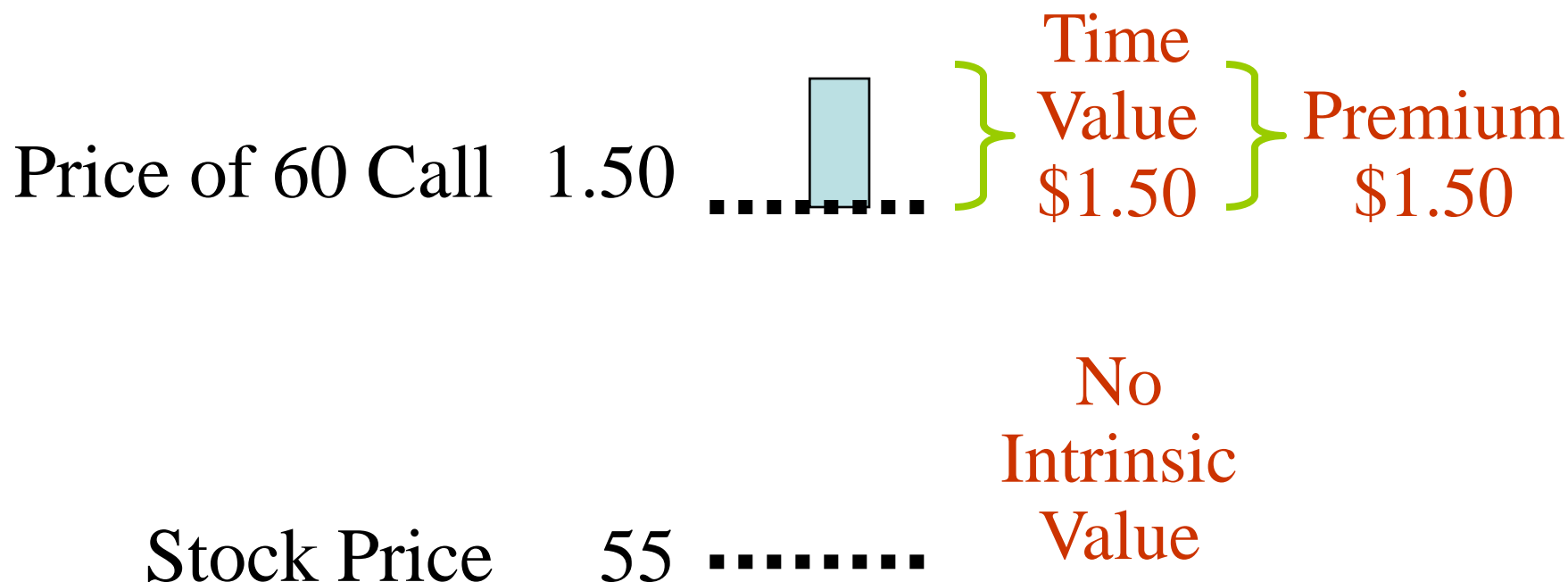
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	<u>Today</u>		<u>Forecast</u>
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Days to Exp.	50	→	40
Aug 88 Call	3.70	→	5.35

Intrinsic Value & Time Value 1

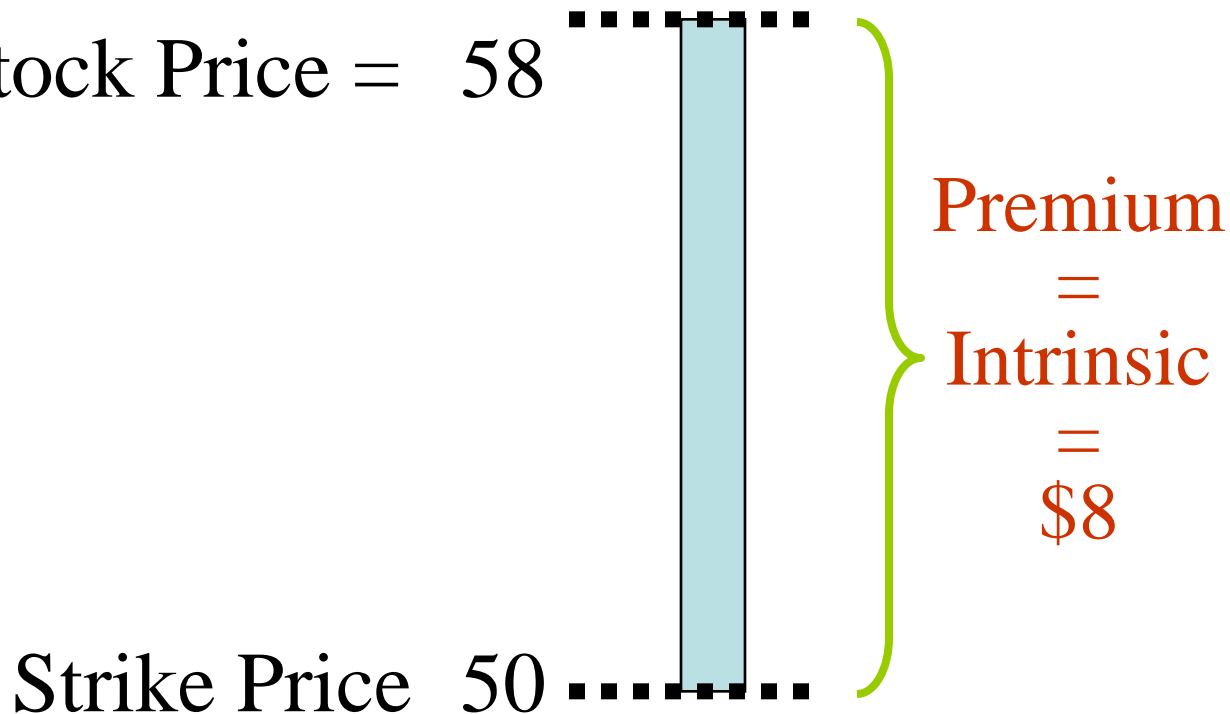


Intrinsic Value & Time Value 2



Parity

Price of 50 Call = 8
& Stock Price = 58



Note: Time Value = 0

Stock \$57.20	Intrinsic Value	Time Value	Premium	In- At- Out-
50 Call	7.20	1.70	8.90	In-
55 Call	2.20	3.55	5.75	In-
60 Call	0	3.50	3.50	Out-
65 Call	0	1.95	1.95	Out-
70 Call	0	1.05	1.05	Out-

Stock \$57.20	Intrinsic Value	Time Value	Premium	In- At- Out-
50 Put	0	1.50	1.50	Out-
55 Put	0	3.30	3.30	Out-
60 Put	2.80	3.15	5.95	In-
65 Put	7.80	1.60	9.40	In-
70 Put	12.80	0.65	13.45	In-

Components of Option Prices

Insurance Policy	Option
Price of Asset	Stock Price
Deductible	Strike Price
Time	Expiration Date
Interest Rates	Interest Rate & Dividends
Level of Risk	Volatility
= PREMIUM	= PREMIUM

Options are like insurance policies.

Volatility corresponds to risk.

What Sometimes Happens

XSP Index	88.00	⇒	92.00
Strike Price	92.00		
Time	35 days	⇒	28 days
Interest Rates	1%		(1 wk passes)
Dividends	0%		
<u>Volatility</u>	<u>27%</u>	⇒	<u>15%</u>
92 Call Price	1.40	⇒	1.40

A decrease in volatility “robs you” of a profit!

- #1 Relax!
- #2 You do not need to be a mathematician to trade options.
- #3 Over time you will become comfortable with the concept.

A Final Trading Quiz - Answer

18 days to expiration

XSP **84.10** → **87.00**

Days to Exp. **18** → **8**

84 Call **1.85** → **3.28** **+1.43** + **77%**

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88 Call **0.51** → **0.82** **+0.31** + **61%**

90 Call **0.23** → **0.30** **+0.07** + **30%**

Today is 7/1, 50 days to August expiration

XSP 92.80 → 96.50

Days to Exp. 50 → 40

(50-day options)

**How do you
“go for % profits”?**

91 Call 4.10 → Buy 3 = \$1,230

93 Call 2.90 → Buy 4 = \$1,160

95 Call 1.95 → Buy 6 = \$1,170

97 Call 1.20 → Buy 10 = \$1,200