Earnings and Implied Volatility

Russell Rhoads, CFA
Instructor – The Options Institute

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Volatility and Earnings

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Implied Volatility

Option Pricing Factors –

Underlying Price

Option Strike Price

Time to Expiration

Interest Rates / Dividends

Implied Volatility

Known

Market Determined

Implied Volatility

Normal Pricing Calculator –

Input	
Stock	43.25
Strike	45
Interest Rate	2.00%
Days	30
Implied Volatility	25%

Output	
Call	0.83
Put	2.48

Implied Volatility

Alternate Pricing Calculator –

Input	
Stock	43.25
Strike	45
Interest Rate	2.00%
Days	30
Call Price	1.00

Output	
Implied Volatility	28%

Implied Volatility

- Option pricing is ultimately determined by market participants
- If options appear cheap, there will be more buying than selling
- If options appear expensive, there will be more selling than buying

Implied Volatility

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XYZ @ 43.25

Jan Expiration = 30 Days

	Bid	Ask
Jan 40 Call	3.65	3.70
Jan 45 Call	0.80	0.85

	Bid	Ask
Jan 40 Call	25.1%	26.4%
Jan 45 Call	25.0%	25.9%

	Bid	Ask
Jan 40 Put	0.30	0.35
Jan 45 Put	2.45	2.50

	Bid	Ask
Jan 40 Put	24.2%	25.6%
Jan 45 Call	24.6%	25.5%

Implied Volatility

XYZ @ 43.25

Jan Expiration = 30 Days

Big Option Buying Hits Market

	Bid	Ask
Jan 40 Call	4.05	4.10
Jan 45 Call	1.35	1.40

	Bid	Ask
Jan 40 Call	34.9%	36.0%
Jan 45 Call	34.9%	35.8%

	Bid	Ask
Jan 40 Put	0.70	0.75
Jan 45 Put	3.00	3.05

	Bid	Ask
Jan 40 Put	34.2%	35.3%
Jan 45 Call	34.5%	36.2%

Implied Volatility Expanded About 10%

Implied Volatility

- Higher demand for options pushes up prices
- All else staying the same (underlying, time, interest rates)
- Higher prices attributed to an expansion of implied volatility

What comes first?

Higher Volatility or Higher Option Prices?

Implied Volatility

- Implied volatility is considered a risk factor for option values
- Option prices increase when risk of big near term move in underlying increases
- Expected news and events are discounted by option markets

Earnings reports are widely known events.

Quarterly Earnings

Quarterly Earnings Reports –

- Four times a year public companies report earnings results
- Significant information varies from report to report
- Each stock reacts differently to earnings
- Option prices may anticipate reports in unique ways

Quarterly Earnings

Earnings Report –

- Information disclosed outside of market hours
- Activity in ‘after hours’ market can be very volatile
- This trading can also be misleading
- What the market expects may not always be obvious

Quarterly Earnings

Potentially Important Information –

- Earnings Per Share
- Revenue Per Share
- Profit Margins
- Key Product Trends
- Forward Looking Statements

Quarterly Earnings

Typical Report –

- Text released
- News services summarize with bullet points
- Company holds conference call

Stock trading is occurring during all of this

Quarterly Earnings

Conference Call –

- Review news release
- Offer clarification or supplementary information
- Field questions from analysts

Stock trading is occurring during all of this

Quarterly Earnings

Leading Up to Announcement Date –

- As an earnings announcement approaches, implied volatility will often rise
- Option prices may increase due to higher implied volatility

Can this expansion of IV be traded?

Quarterly Earnings

XYZ @ 45.00

Reports Earnings in 5 Days

Current Implied Volatility = 30%

Normal Earnings Implied Volatility = 35%

How about Buy 45 Straddle

Sell Straddle Before Earnings?

Quarterly Earnings

XYZ @ 45.00 –

15 Days / 30% Implied Volatility

	Bid	Ask
45 Call	1.30	1.35
45 Put	1.25	1.30

Long 1 45 Straddle @ 2.65

Sell 1 45 Straddle @ 2.45

Net Loss = 0.20

XYZ @ 45.00 –

10 Days / 35% Implied Volatility

	Bid	Ask
45 Call	1.25	1.30
45 Put	1.20	1.25

Quarterly Earnings

XYZ @ 45.00

Reports Earnings in 5 Days

Current Implied Volatility = 30%

Normal Earnings Implied Volatility = 40%

How about Buy 45 Straddle /

Sell Straddle Before Earnings?

Quarterly Earnings

XYZ @ 45.00 –

15 Days / 30% Implied Volatility

	Bid	Ask
45 Call	1.30	1.35
45 Put	1.25	1.30

Long 1 45 Straddle @ 2.65

Sell 1 45 Straddle @ 2.85

Net Gain = 0.20

XYZ @ 45.00 –

10 Days / 40% Implied Volatility

	Bid	Ask
45 Call	1.45	1.50
45 Put	1.40	1.45

Quarterly Earnings

- Implied volatility often expands into earnings
- This is not an overnight phenomena
- The increase in volatility weighs the impact of time decay
- These two pricing factors may offset each other

Can this expansion of IV be traded?

Maybe…

Quarterly Earnings

Trading Through Earnings Reports –

- Earnings reports may increase the risk of price movement from the underlying stock
- This is often included in option prices
- After earnings risk of big price move has lessened

Quarterly Earnings

XYZ @ 55.00 - Reports After the Close

Implied Volatility @ 35% (normally 20%)

July Options Expire in 9 Days

XYZ July 55 Call	1.50
XYZ July 55 Put	1.45

XYZ July 55 Straddle @ 2.95

Quarterly Earnings

XYZ @ 55.00 (unchanged) – Next Day

Implied Volatility @ 20% (back to normal)

July Options Expire in 8 Days

XYZ July 55 Call	0.75
XYZ July 55 Put	0.70

XYZ July 55 Straddle @ 1.45

Drop in Implied Volatility +

Passage of One Day = 1.50 loss in value

Quarterly Earnings

XYZ @ 57.75 (up 2.75) – Next Day

Implied Volatility @ 20% (back to normal)

July Options Expire in 8 Days

XYZ July 55 Call	2.85
XYZ July 55 Put	0.10

XYZ July 55 Straddle @ 2.95

Stock move of 2.75 to Upside to Break Even

Quarterly Earnings

XYZ @ 52.20 (down 2.80) – Next Day

Implied Volatility @ 20% (back to normal)

July Options Expire in 8 Days

XYZ July 55 Call	0.10
XYZ July 55 Put	2.85

XYZ July 55 Straddle @ 2.95

Stock move of 2.80 to Downside to Break Even

Quarterly Earnings

What we now have estimated –

- 2.75 to 2.80 move needed on 55.00 stock for straddle to break even
- Option market is pricing in about a 5% move on earnings

Why is this useful?

Quarterly Earnings

XYZ @ 55.00 - Reports After the Close

Implied Volatility @ 35% (normally 20%)

July Options Expire in 9 Days

XYZ July 55 Call	1.50
XYZ July 55 Put	1.45

XYZ July 55 Straddle @ 2.95

Considering Long Straddle

Quarterly Earnings

Case #1 XYZ Earnings History –

Quarter	Earnings Price Reaction		Quarter	Earnings Price Reaction
1Q 2011	+11.8%		3Q 2009	-8.1%
4Q 2010	-10.5%		2Q 2009	+10.1%
3Q 2010	+7.9%		1Q 2009	-12.6%
2Q 2010	+13.1%		4Q 2008	-5.8%
1Q 2010	-9.8%		3Q 2008	-7.4%
4Q 2009	+6.8%		2Q 2008	+7.9%

Options Pricing in a 5% Move

Possible Trade?

Quarterly Earnings

Case #1 – History Applied

	Reaction	55 x Reaction	55 Call	55 Put	Straddle
1Q 2011	+11.8%	61.49	6.52	0.00	6.52
4Q 2010	-10.5%	49.23	0.00	5.74	5.74
3Q 2010	+7.9%	59.35	4.39	0.01	4.40
2Q 2010	+13.1%	62.21	7.24	0.00	7.24
1Q 2010	-9.8%	49.61	0.00	5.36	5.36
4Q 2009	+6.8%	58.74	3.79	0.02	3.81
3Q 2009	-8.1%	50.55	0.01	4.43	4.44
2Q 2009	+10.1%	60.56	5.59	0.00	5.59
1Q 2009	-12.6%	48.07	0.00	6.90	6.90
4Q 2008	-5.8%	51.81	0.04	3.20	3.24
3Q 2008	-7.4%	50.93	0.01	4.05	4.06
2Q 2008	+7.9%	59.35	4.39	0.01	4.40

Straddle Cost = 2.95

Quarterly Earnings

Case #1 – Straddle Values Based on History –

- Average Price Move = 5.14
- Maximum Move = 7.24
- Minimum Move = 3.24

Straddle Cost = 2.95

Maybe Consider Long Straddle?

Quarterly Earnings

Case #2 XYZ Earnings History –

Quarter	Earnings Price Reaction		Quarter	Earnings Price Reaction
1Q 2011	+1.8%		3Q 2009	-2.1%
4Q 2010	-0.5%		2Q 2009	+0.1%
3Q 2010	+0.2%		1Q 2009	+1.2%
2Q 2010	+3.1%		4Q 2008	-3.8%
1Q 2010	-2.2%		3Q 2008	-2.4%
4Q 2009	-0.3%		2Q 2008	-1.2%

Options Pricing in a 5% Move
Possible Trade?

Quarterly Earnings

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Case #2 – History Applied

	Reaction	55 x Reaction	55 Call	55 Put	Straddle
1Q 2011	+1.8%	55.99	1.40	0.38	1.78
4Q 2010	-0.5%	54.73	0.66	0.91	1.57
3Q 2010	+0.2%	55.11	0.85	0.72	1.57
2Q 2010	+3.1%	56.71	1.95	0.21	2.16
1Q 2010	-2.2%	53.79	0.32	1.50	1.82
4Q 2009	-0.3%	54.84	0.72	0.85	1.57
3Q 2009	-2.1%	53.85	0.34	1.46	1.80
2Q 2009	+0.1%	55.06	0.83	0.74	1.57
1Q 2009	+1.2%	55.66	1.18	0.49	1.67
4Q 2008	-3.8%	52.91	0.14	2.20	2.34
3Q 2008	-2.4%	53.68	0.29	1.59	1.88
2Q 2008	-1.2%	54.34	0.50	1.13	1.63

Straddle Cost = 2.95

Quarterly Earnings

Case #2 – Straddle Values Based on History –

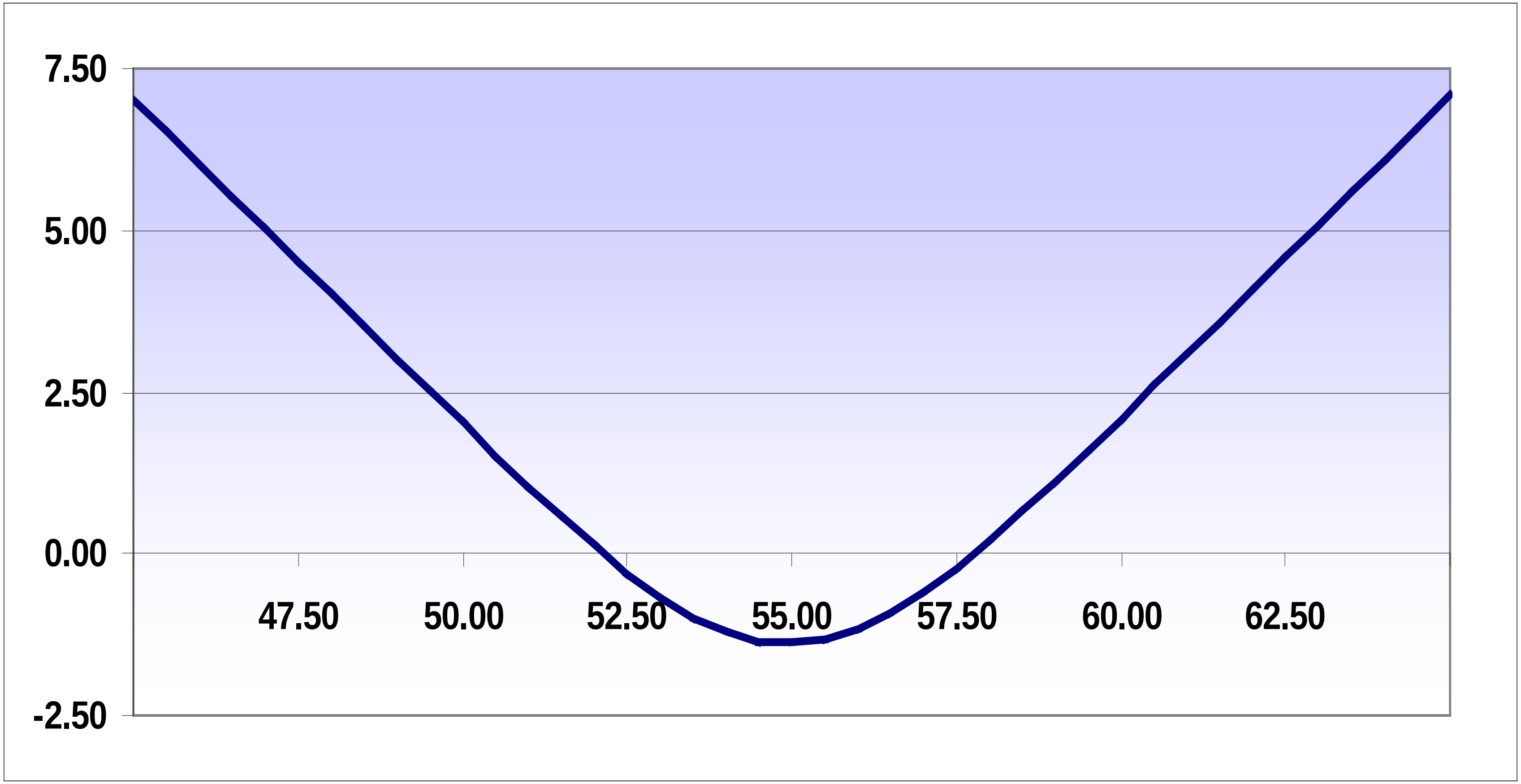
- Average Price Move = 1.78
- Maximum Move = 2.34
- Minimum Move = 1.57

Straddle Cost = 2.95

Maybe Consider Short Straddle?

Quarterly Earnings

Post Earnings July 55 Straddle Payout –



Quarterly Earnings

- Direction of price reaction is not indicated by option premiums
- Magnitude of move may be indicated by implied volatility
- Comparing history of stock reaction to earnings announcements may result in a trade idea

Quarterly Earnings

Other events –

- New Product Announcements
- Monthly Sales Releases (retailers)
- FDA Announcements (drugs / bio tech)
- Economic Numbers

Quarterly Earnings

Summary –

- Some stocks have a pattern of volatility around earnings
- Comparing this history with current anticipation may result in a potential trade
- As always, past performance does not equal future results

Contact

The CBOE Website has more information on a wide variety of option strategies.

www.cboe.com/learncenter

Questions / Comments?

rhoads@cboe.com