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VETICAL SPREADS

Factors that Affect Spread Pricing

The determination of pricing as described above works in most cases but please be aware that this assumes that the implied volatility in both the 35 and 40 calls is the same. Most of the time, these two options will have a slightly different implied volatility.

This intra-month difference in implied volatility values through different strikes is known as a vertical volatility skew. The reason the markets run volatility skews is to make sure that out-of-the-money options have enough premium in them to justify the individual option's risk/reward scenario. Volatility skewness will be covered in more depth in the future releases where we will cover the Option Pricing Model and the Greeks.

For now, it is enough to know that there is a volatility skew, but as long as it is a tight skew (little deviation of implied volatility from strike to strike) the values should hold pretty consistent in our previous examples.

Whatever factors effect the vertical spread, they are contingent on where the stock is in relation to the spread. Changes in implied volatility affect the price of a spread as stated above but the position of the stock in relation to the strikes of the spread are a key determinate of price.

Volatility

To get a good feel for volatility's effect on vertical spreads, we will look at three different spreads, against three different implied volatilities while keeping the stock price constant at 67 ½. The three spreads we will be looking at will be the 60 – 65 call spread, the 65- 70 call spread and the 70 – 75 call spread.

	30 vol.	**$ Amount Change**	**40 Vol.**	**$ Amount Change**	**50 Vol.**	**$ Amount Change**
June 60 – 65 ITM	4.28	---	3.95	-,33	3.67	-.28
June 65 – 70 ATM	2.47	---	2.44	-.03	2.41	-.03
June 70 – 75 OTM	.75	---	1.04	+.29	1.25	+.21

Looking at the chart we observe how volatility movements affect in-the-money, at-the-money and out-of-the-money vertical spreads.

Looking at the in-the-money spread (June 60 – 65) we see that as volatility increases, the value of the spread decreases. This is because with the increased volatility, the stock will have a greater tendency to move around and that will bring a higher likelihood of the stock moving to a price where the June 60 – 65 call spread will no longer be in-the-money.

To adjust for higher volatility risk, the spread will have less value. The rule of thumb is that as volatility increases, the value of in-the-money vertical spreads decrease. Vice-versa, as volatility decreases, an in-the-money vertical spread's value increases.

The at-the-money vertical spread (June 65 – 70) will see very little effect with the change in volatility. With the stock price located equidistant from the two strikes, each strike's volatility component will be very similar. Thus, when volatility increases both options will increase equally. Being long one and short the other, the increase in values will offset each other so the spreads value will hold pretty constant. The rule of thumb is that when volatility increases or decreases, the value of an at-the-money vertical spread will stay reasonably constant.

The out-of-the-money vertical spread (June 70 – 75) has the opposite effect of the in-the-money vertical spread (June 60 – 65). As volatility increases, the value of the out-of-the-money vertical spread will increase. This is because the increase in volatility assumes that the stock price will be more likely to move and thus the out-of-the-money vertical call spread will be more likely to finish in-the-money.

Because of the increased potential of this spread's ability to finish in-the-money, the value of the spread will increase. However, if volatility decreases, the value of the spread will decrease. The rule of thumb is that when volatility increases, an out-of-the-money vertical spread's value increases. When volatility decreases, the spread's value decreases.

Below, find a chart showing what happens to option deltas when volatility increases or decreases.

Implied Volatility	**ATM**	**ITM**	**OTM**
+ increases	even	decreases	increases
- decreases	even	increases	decreases

When trying to estimate how your spread will change in price with volatility movement, you must understand how the price and delta of both of your options, (the long option and the short option) will act.

It bears repeating again that each spread is different and will act differently depending on where the stock is in relation to the spread and what implied volatility does.

A good rule of thumb is that *when volatility increases, spreads crunch to their median value.* For example, the median value of a five dollar spread will be $2.50 while a $10.00 spread will have a $5.00 median value.
Crunching to the median value means that a $5.00 spread that has a medium value over $2.50 will lose value and head toward the median price. That happens with an increase in volatility. Meanwhile, that increased implied volatility will make a spread with a value less than $2.50 increase in value, heading up toward median value.

When implied volatility decreases, the value of a $5.00 spread will move away from the median price of $2.50. So, when implied volatility decreases, all the spreads valued above $2.50 will increase in value toward maximum value, while spreads valued below $2.50 will lose value and head toward $0.

Time effects the spread differently depending on where the stock is. As an example, we will look at the QCOM 65 – 70 call spread. We view the spread over time and across three different stock prices. First, let's look at the spread's reaction to the passing of time with the stock price of $65.50. Below, find a chart showing what the spreads value does as expiration approaches.

Month	65 – 70 call spread value	Change from prior
Jan. 05 (8 month option)	2.06	N/A
Oct. 04 (5 month option)	2.05	-.01
Jul. 04 (2 month option)	1.92	-.13
June 04 (1 month option)	1.65	-.27

With the stock at $65.50, the spread has $.50 of intrinsic value. Holding the stock price frozen at $65.50 until expiration the spread would be worth $.50. As seen by the table above, the spread loses value as time passes and decreases in value toward it's $.50 intrinsic value.

Next, we will look at the 65 – 70 spread's reaction to the passage of time with the stock priced at $67.50.

Month	65 – 70 call spread value	Change from prior
Jan. 05 (8 month option)	2.33	N/A
Oct. 04 (5 month option)	2.37	+.04
Jul. 04 (2 month option)	2.44	+.07
June 04 (1 month option)	2.47	+.03

As you can see, with the stock price located directly in between the two strikes, the price of the spread holds at approximately $2.50 throughout the passing of time. As a rule of thumb, time has very little effect on a vertical spread when the stock price lies half-way (equidistant) between the two strikes of the spread.

Now, we set the stock price at $69.50 and observe how the spread reacts over time.

Month	65 – 70 call spread value	Change from prior
Jan. 05 (8 month option)	2.55	N/A
Oct. 04 (5 month option)	2.67	+.12
Jul. 04 (2 month option)	2.96	+.29
June 04 (1 month option)	3.27	+.31

The chart shows that as time passes, this spread increases in value. With the stock at $69.50, the spread has an intrinsic value of $4.50. If the stock held at $69.50 until expiration, the spread would be worth $4.50 because that is the amount of intrinsic value the spread has. As time passes, the spread's value will increase to finally reach $4.50 at expiration.

In conclusion, time's effect on a vertical spread is contingent on where the stock is in relation to the spread.

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