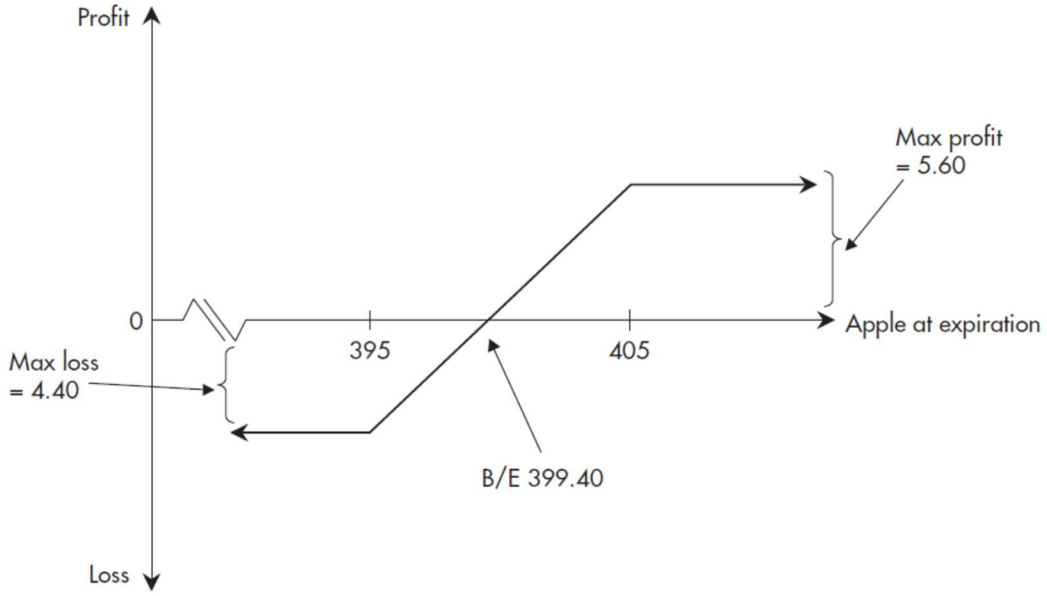
Case Study - Bull Call Spread versus Outright Call

Consider a bull call spread on Apple Inc. (AAPL):

Buy 1 Apple Feb 395 Call	@14.6
Sell 1 Apple Feb 405 Call	@10.2
Total Cost	4.40

Suppose that Apple is trading at $391 and there are 40 days until February expiration.

EXHIBIT 9.1 AAPL bull call spread.



Note: for simplicity, we do not consider the future value of the options cost in the diagram.

Now, we compare the greeks between the bull call spread and the outright 395 call.

EXHIBIT 9.2 Apple call versus bull call spread (Apple @ $391).

	395 Call	395–405 Call
Delta	0.484	0.100
Gamma	0.0097	0.0001
Theta	−0.208	−0.014
Vega	0.513	0.020

Observations:

1. The positive deltas indicate that both options are bullish, but the outright call has a higher delta. The spread delta is only about 20% of the outright call's delta.
2. Theta spread's risk is about 7% that of the outright.
3. The spread's vega risk is less than 4% that of the outright call.

EXHIBIT 9.3 AAPL 395–405 bull call spread.

	AAPL @ $395	AAPL @ $400	AAPL @ $405
Delta	0.100	0.101	0.097
Gamma	0.0002	−0.0001	−0.0002
Theta	−0.009	0.001	0.004
Vega	0.010	−0.006	−0.035

Observations:

1. With Apple sitting at around the long strike (395), gamma and vega have their greatest positive value, and theta has its most negative value.
2. When the underlying is directly between the two strike prices: The long call has ceased to be the dominant influence on these metrics. Both calls influence the analytics pretty evenly. The time-decay risk has been entirely spread off. The volatility risk is mostly spread off. Gamma remains a minimal concern. When the greeks of the two calls balance each other, the result is a directional play.
3. As AAPL continues to move closer to the 405-strike, it becomes the at-the-money option, with the dominant greeks. The gamma, theta, and vega of the 405 call outweigh those of the ITM 395 call. Vega is more negative. Positive theta now benefits the trade. The net gamma of the spread has turned negative. Because of the negative gamma, the delta has become smaller than it was when the stock was at $400. This means that the benefit of subsequent upward moves in the stock begins

to wane.

4. When the stock is at the 405 strike, the characteristics of the trade are much different that they are when the stock is at the 395 strike. Instead of needing movement upward in the direction of the delta to combat the time decay of the long calls, the position can now sit tight at the short strike and reap the benefits of option decay.

Bull Call Spread versus Outright Purchase of 395 Call

1. A bull call spread will always be cheaper than the outright call purchase.
2. The tradeoff of the bull call spread is the limited profit as compared with the outright call purchase. For smaller moves – up to the price of the short strike – vertical spreads tend to be better trades than outright call purchases. Beyond the strike? Not so much.
3. The more time that passes, the more advantageous the lower-theta vertical spread becomes.

Example 1

If Apple were to rise to be trading at $405 at *expiration*,

a) the 395 call rises to be worth $10, for a loss of $4.6 on the $14.6 debit paid.
b) the spread is worth $10. It yields a gain of about 127% on the initial $4.40 per share debit.

By comparing (a) and (b), we observe that the spread has greater profit that the call.

Example 2

If Apple rallies to $405 after only a couple weeks (with four weeks still left until expiration),

c) the 395 call is worth $19.85 with the underlying at $405. That's a 36% gain on the $14.6.
d) the spread is worth $5.7. That's a 30% gain.

By comparing (a) and (b), we observe that the call has greater profit that the spread.

From Examples 1 and 2, we observe that the vertical spread must be held until expiration to reap the full benefits, which it accomplishes through erosion of the short option. The long-call-only play (with a significantly larger negative theta) is punished severely by time passing. The long call benefits more from a quick move in the underlying. And of course, if the stock were to rise to a price greater than $405, in a short amount of time—the best of both worlds for the outright call—the outright long 395 call would be emphatically superior to the spread.