What?

Bull call calendar spread includes two option positions:

- Long call with longer maturity
- Short call with shorter maturity
- Both long call and short call have the same strike price

The purpose is to speculate with call options when we are bullish. This is achieved with the long call with longer maturity. This will be expensive due to longer maturity. However, short call with shorter maturity will make this spread cheaper. It is possible to have new short maturity short calls against the long maturity long calls as short calls expire. Bull call calendar spread is a speculative debit position.

Option pricing model

Calendar spread examples require the use of Black, Scholes and Merton option pricing models and corresponding option pricing calculator. These two publications are as follows:

Black, Fischer, and Myron Scholes. "The pricing of options and corporate liabilities." Journal of political economy 81.3 (1973): 637-654.

Merton, Robert C. "Theory of rational option pricing." The Bell Journal of economics and management science (1973): 141-183.

Many different option pricing calculators are available online with no particular superiority from one another.

Example

Currently, AAPL is trading at $200. We have a bullish expectation on AAPL. Risk-free rate is 1%. Expected volatility is 50%.

Bull call calendar spread will include:

- Long call, strike price of $200, **maturity of 2 weeks**, pay $7.85 per share
- Short call, strike price of $200, **maturity of 1 week**, collect $5.54 per share

Our initial cash flow:

- Long call ⇒ -$7.85 × 100 shares = -$785
- Short call ⇒ $5.54 × 100 shares = $554
- Net cash flow = -$785 + $554 = **-$231**

Possible outcomes at the end of one week:
Please note that because the primary purpose of a calendar spread is to take advantage of option premiums our example will calculate the expected option price using an online option price calculator.

Price scenarios are at the end of the first week.

- AAPL stock price increases to $220
  - Long call: We can sell our long call option at $20.60 (calculated using an online option price calculator). $20.60 per share × 100 shares = $2,060 profit
  - Short call value: Some trader, who bought our call option, has a right to buy AAPL from us at $200 a share. We sell 100 AAPL shares at $200. Outcome = $220 - $200 = $20 per share × 100 shares = $2,000 loss.
  - We paid: $231
  - **Overall outcome** ⇒ Long call ($2,060 profit) and Short call ($2,000 loss) and initial payment ($116) = **$171 loss**.
- AAPL stock price increases to $210
  - Long call: We can sell our long call option at $12.04 (calculated using an online option price calculator). $12.04 per share × 100 shares = $1,204 profit
  - Short call value: Some trader, who bought our call option, has a right to buy AAPL from us at $200 a share. We sell 100 AAPL shares at $200. Outcome = $210 - $200 = $10 per share × 100 shares = $1,000 loss.
  - We paid: $231
  - **Overall outcome** ⇒ Long call ($1,204 profit) and Short call ($1,000 loss) and initial payment ($231) = **$27 loss**.
- AAPL stock price stays the same at $200
  - Long call: We can sell our long call option at $5.54 (calculated using an online option price calculator). $5.54 per share × 100 shares = $554 profit
  - Short call value: Some trader, who bought our call option, has a right to buy AAPL from us at $200 a share. We sell 100 AAPL shares at $200. Outcome = $200 - $200 = $0 per share

    $\times$ 100 shares = \$0 loss/profit.
- – We paid: \$231
- – **Overall outcome** $\Rightarrow$ Long call (\$554 profit) and Short call (\$0 loss/profit) and initial payment (\$231) = **\$323 profit**.
- • AAPL stock price decreases to \$190
  - – Long call: We can sell our long call option at \$1.81 (calculated using an online option price calculator). \$1.81 per share $\times$ 100 shares = \$181 profit
  - – Short call value: Some trader, who bought our call option, has a right to buy AAPL from us at \$200 a share. Spot price is \$190. \$0 loss/profit.
  - – We paid: \$231
  - – **Overall outcome** $\Rightarrow$ Long call (\$181 profit) and Short call (\$0 loss/profit) and initial payment (\$231) = **\$50 loss**.

Comment

Notice how any scenario that has a price change results in a loss. The only scenario that has some profit is the one with no price change. But, this is a **Bull call calendar spread**. How is this possible?

Keep in mind that the price scenarios are at the end of the first week. The idea behind the short call option with the shorter maturity is to make the initial long call option with the longer maturity cheaper. So, as long as the spot price stays below \$200, we still own a long call option with one week of maturity left.

What could make the calendar spread more interesting perhaps is to consider different strike prices for the long and the short call options.