

**What?**

Bull call spread includes two option positions:

- Long call
- Short call

The purpose is to speculate with call options when we are bullish. Bull call spread limits the upside profit potential. However, bull call spread is cheaper compared to simply buying a naked call option. Bull call spread is a speculative position with limited loss and limited profit.

**Example**

Currently, AAPL is trading at \$200. We have a bullish expectation on AAPL. A call option with a strike price of \$200 and maturity date of January 18<sup>th</sup> on AAPL is trading at \$2 per share. Another call option with a strike price of \$220 and maturity date of January 18<sup>th</sup> on AAPL is trading at \$1 per share.

Bull call spread will include:

- Long call with strike price of \$200 and pay \$2 per share
- Short call with strike price of \$220 and collect \$1 per share

**Our initial cash flow:**

- Long call  $\Rightarrow -\$2 \times 100 \text{ shares} = -\$200$
- Short call  $\Rightarrow \$1 \times 100 \text{ shares} = \$100$
- Net cash flow  $= -\$200 + \$100 = -\$100$

**Possible outcomes:**

- AAPL stock price increases to \$250
  - Long call: We have a right to buy AAPL at \$200 per share. We buy AAPL shares at \$200. Outcome  $= \$250 - \$200 = \$50$  per share  $\times 100$  shares  $= \$5,000$  profit.
  - Short call: Some trader, who bought our call option, has a right to buy AAPL from us at \$220 a share. We sell 100 AAPL shares at \$220. Outcome  $= \$250 - \$220 = \$30$  per share  $\times 100$  shares  $= \$3,000$  loss.
  - We paid: \$100
  - **Overall outcome**  $\Rightarrow$  Long call (\$5,000 profit) + Short call (\$3,000 loss) + initial payment (\$100) = **\$1,900 profit.**
- AAPL stock price increases to \$220

- Long call: We have a right to buy AAPL at \$200 per share. We buy AAPL shares at \$200. Outcome  $= \$220 - \$200 = \$20$  per share  $\times 100$  shares  $= \$2,000$  profit.
- Short call: Some trader, who bought our call option, has a right to buy AAPL from us at \$220 a share. S/he does not buy at our strike price. Outcome  $= \$0$  profit/loss.
- We paid: \$100
- **Overall outcome**  $\Rightarrow$  Long call (\$2,000 profit) + Short call (\$0 profit/loss) + initial payment (\$100) = **\$1,900 profit.**
- AAPL stock price increases to \$210
  - Long call: We have a right to buy AAPL at \$200 per share. We buy AAPL shares at \$200. Outcome  $= \$210 - \$200 = \$10$  per share  $\times 100$  shares  $= \$1,000$  profit.
  - Short call: Some trader, who bought our call option, has a right to buy AAPL from us at \$220 a share. S/he does not buy at our strike price. Outcome  $= \$0$  profit/loss.
  - We paid: \$100
  - **Overall outcome**  $\Rightarrow$  Long call (\$1,000 profit) + Short call (\$0 profit/loss) + initial payment (\$100) = **\$900 profit.**
- AAPL stock price stays the same at \$200
  - Long call: We have a right to buy AAPL at \$200 per share. We do not buy at our strike price. Outcome  $= \$0$  profit/loss.
  - Short call: Some trader, who bought our call option, has a right to buy AAPL from us at \$220 a share. S/he does not buy at our strike price. Outcome  $= \$0$  profit/loss.
  - We paid: \$100
  - **Overall outcome**  $\Rightarrow$  Long call (\$0 profit/loss) + Short call (\$0 profit/loss) + initial payment (\$100) = **\$100 loss.**
- AAPL stock price decreases to \$150
  - Long call: We have a right to buy AAPL at \$200 per share. We do not buy at our strike price. Outcome  $= \$0$  profit/loss.
  - Short call: Some trader, who bought our call option, has a right to buy AAPL from us at \$220 a share. S/he does not buy at our strike price. Outcome  $= \$0$  profit/loss.
  - We paid: \$100

- **Overall outcome**  $\Rightarrow$  Long call (\$0 profit/loss)  
+ Short call (\$0 profit/loss) + initial payment  
(\$100) = **\$100 loss.**

### Possible outcome

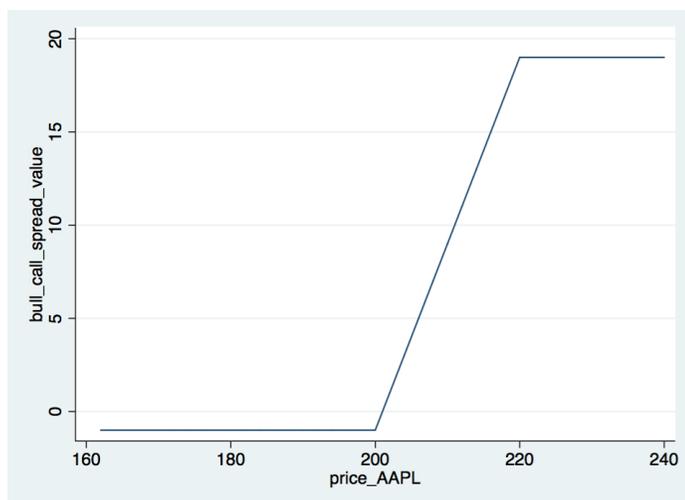
We will now evaluate possible outcomes of bull call spread strategy in our previous example. Note that, since it is hard to determine the premium, our exercise is based on exercise value.

```
set obs 40
gen price_AAPL = 160 + (_n*2)

* Long call with strike price of $200 and pay $2 per share
gen long_call_price = 2
gen long_strike = 200
gen long_call_value = max(price_AAPL-long_strike,0) - long_call_price

* Short call with strike price of $220 and collect $1 per share
gen short_call_price = 1
gen short_strike = 220
gen short_call_value = -(max(price_AAPL-short_strike,0) - short_call_price)

* Combined bull call spread strategy
gen bull_call_spread_value = long_call_value + short_call_value
twoway (line bull_call_spread_value price)
```



The horizontal axis is the possible AAPL share price in the market. The vertical axis is the option strategy outcome based on possible AAPL share prices. Note that this specific example has a maximum possible gain of \$1,900 and maximum possible loss of \$100.