

# How to Use the Profit/Loss Calculator



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# 1. Introduction

The P/L Calculator is an easy way to chart the profit and loss potential of your trades before you place them, or to evaluate your existing positions.

Enter as many options legs as you wish using the integrated option chain, and the graph will automatically display in the main window.

A table summarizing profit and loss information appears to the left of the graph. Move the crosshairs on the graph to select a point at which to evaluate how profits and losses have changed with the underlying price.

The tables below the graph display the risk parameters and analytics for the entire position. You can change the Volatility or Days to Expiration to simulate alternative assumptions and see how the changes affect profitability and price targets.

*Commission, dividends, margins, taxes and other transaction charges have not been included in the following examples. However, these costs can have a significant effect on expected returns and should be considered. Because of the importance of tax considerations to all options transactions, the investor considering options should consult with his/her tax advisor as to how taxes affect the outcome of contemplated options transactions.*

# 2. Getting Started

Enter an underlying stock, index, or ETF symbol and click Add Option Contract(s), or just press enter. (If you don't know the symbol, click Find Symbol and enter the company name.)

Once you enter the underlying symbol, the option chain listing all options on this underlying will display in a separate window. If the option chain window does not display, check that your browser is set to allow pop-up windows from this page.

The screenshot shows the 'Options' section of a research tool. At the top, there are navigation tabs: Overview, Quotes, Analysis Tools, Ideas & Screens, Reports & Commentary, and Education. Below these are sub-tabs: Strategy Evaluator, P/L Calculator, and IV Index. A link for 'How to Use the P/L Calculator (PDF)' is also present.

The main interface includes an 'Underlying' input field with an 'Add Option Contract(s)' button. A tooltip points to this button with the text: 'To begin, enter a symbol and click Add Option Contract(s). Learn how to use the P/L Calculator (PDF)'. Below the input field are controls for 'Days to Expiration' (Today: 08/11/10, Expiration: 08/12/10) and 'Volatility Change' (ranging from -100% to 100%).

On the right, there is a 'Price Points' table with columns for 'Price' and 'P/L'. Below this is a 'Graph Display' area with radio buttons for 'Price' and 'Mid-Price', and a link for 'Invert Position'. The graph area contains a large placeholder message: 'To begin, enter a symbol and click Add Option Contract(s)'.

At the bottom, there are two summary tables. The first is titled 'Total Strategy' and has columns for Bid, Mid, Ask, Delta, Gamma, and Theta. The second is a detailed table with columns: Buy/Sell, Quantity, Expiration/Strike, Bid, Ask, Theoretical Price, Evaluation Price, IV, Delta, Gamma, Theta, Vega, and Action.

## 2.1 Adding Option Contracts to the Calculator

You can add a position or a multi-leg strategy to the P/L Calculator from the option chain window as follows:

1. To add **individual option legs**, click on the bid price link to sell, or the ask price link to buy.
2. To add a **multi-leg strategy**, select the strategy you want from the Strategy dropdown, click Find, and then click the Net Bid or Net Ask price links for the strategy you would like to add. This will add all legs for the strategy to the P/L Calculator.

*Note: You cannot add more than one strategy to the calculator at a time. If you have already added a multi-leg strategy, selecting a second multi-leg strategy will replace the first one.*

3. To add the **underlying** stock or ETF to the P/L Calculator, you can simply click Add underlying to calculator in the lower right corner of the window.

*Note: If the underlying is an index, you cannot add it to the calculator because indexes are not tradable. Instead, you could add an ETF based on the index. For example, if you would like to add the S&P 500 (SPX) to the calculator, you could enter SPY, which is the tradable ETF for the S&P 500 Index.*

### Individual Legs

Find Options: Fidelity Investments - Microsoft Internet Explorer

Fidelity.com

Underlying: GOOG Strategy: Calls & Puts Expiration: Next 3 Months Find

GOOG - GOOGLE INC. As of 12:58:00PM ET 08/06/2010

Last	Change	Bid Size	Bid	Ask	Ask Size	Volume
493.76	+8.17	2	493.76	493.93	3	1,089,463

To add a contract to the calculator, click the Bid or Ask price

Calls & Puts for GOOG

Last	Volume	Bid	Ask	Strike	Last	Volume	Bid	Ask	
Calls for Aug 21 2010									
245.20	0	242.30	245.20	250	245.20	0	242.30	245.20	
234.70	0	232.30	235.20	260	234.70	0	232.30	235.20	
0.00	0	222.30	225.20	270	0.00	0	222.30	225.20	
0.00	0	212.30	215.20	280	0.00	0	212.30	215.20	
194.80	0	202.30	205.20	290	194.80	0	202.30	205.20	
184.30	0	192.30	195.20	300	184.30	0	192.30	195.20	
134.30	0	182.30	185.20	310	134.30	0	182.30	185.20	
184.60	0	172.30	175.20	320	184.60	0	172.30	175.20	
154.00	0	162.20	165.20	330	154.00	0	162.20	165.20	

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### Multi-Leg Strategy

Find Options: Fidelity Investments - Microsoft Internet Explorer

Fidelity.com

Underlying: GOOG Strategy: Diagonal Near Expiration: Aug 21, 2010 Far Expiration: Sep 18, 2010 Offset: 10.00 Find

GOOG - GOOGLE INC. As of 12:58:00PM ET 08/06/2010

Last	Change	Bid Size	Bid	Ask	Ask Size	Volume
493.76	+8.17	2	493.76	493.93	3	1,089,463

To add a contract to the calculator, click the Bid or Ask price

Call Spreads

Net Bid	Net Ask	Strike	Net Bid	Net Ask
Aug 21, 2010/Sep 18, 2010				
6.90	8.50	420 / 430	2.00	2.20
6.20	7.80	430 / 440	2.70	2.95
4.80	6.60	440 / 450	3.65	4.00
4.00	5.70	450 / 460	5.15	6.45
2.20	3.20	460 / 470	6.95	7.30
0.10	1.00	470 / 480	9.10	9.55
-2.20	-1.50	480 / 490	11.50	12.10
-4.10	-3.50	490 / 500	13.30	14.00
-4.80	-4.40	500 / 510	13.90	14.90

Put Spreads

Net Bid	Net Ask
2.00	2.20
2.70	2.95
3.65	4.00
5.15	6.45
6.95	7.30
9.10	9.55
11.50	12.10
13.30	14.00
13.90	14.90

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The selected option contracts or multi-leg strategy will be added to the calculator and displayed on the graph:

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Thursday, October 7, 2010

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Overview Quotes Analysis Tools Ideas & Screens Reports & Commentary Education

Strategy Evaluator | P/L Calculator | IV Index Refresh | How to Use the P/L Calculator (PDF)

Underlying: **YHOO** Add Option Contract(s) Find Symbol **YHOO - YAHOO INC.**  
Last: 14.40 | Change: -3.69

**Price/Volatility** Interest Dividends/Size

Evaluation Price: 14.40  
Days to Expiration: 0  
Today: 10/07/10 Expiration: 10/16/10  
Volatility Change: 0.00% Absolute

Price Points	P/L
7.50	-\$145.00
12.00	-\$144.36
13.45	\$0.00
13.50	\$5.00
14.01	\$53.96
14.55	\$0.00
15.00	-\$45.00
16.00	-\$145.00
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Graph Display Price Mid-Price Invert Position

Profit / Loss (\$) vs Stock Price

**Total Strategy**

Bid	Mid	Ask	Delta	Gamma	Theta	Vega
1.32	1.39	1.45	-100.00	0.00	0.00	0.00

Trade Strategy Unbundle Strategy (Only individual legs may be traded)

Buy/Sell	Quantity	Expiration/Strike	Bid	Ask	Theoretical	Evaluation Price	IV	Delta	Gamma	Theta	Vega	Action
Buy/Sell	1	Oct 16 2010 13.00 Call	0.51	0.54	0.51	0.51	31.49	-200.00	-0.00	-0.00	-0.00	Trade
Buy/Sell	2	Oct 16 2010 14.00 Call	2.37	2.43	2.43	2.43	52.28	100.00	0.00	0.00	0.00	Trade
Buy/Sell	1	Oct 16 2010 15.00 Call	0.03	0.04	0.04	0.04	45.90	0.00	0.00	0.00	0.00	Trade

P/L Calculator Provided by: IVolatility.com

### 3. Working with Positions

#### 3.1 Position Legs Details

Once the legs of a strategy and/or stock have been added to the calculator, check the details of each leg and make any necessary corrections. All changes to the option legs can be made in the position details table.

3.	4.		2.		1.		5.					
Buy/Sell	Quantity	Expiration/Strike	Bid	Ask	Theoretical	Evaluation Price	IV	Delta	Gamma	Theta	Vega	Action
Buy/Sell	1	Oct 16 2010 13.00 Call	0.51	0.54	0.51	0.51	31.49	-200.00	-0.00	-0.00	-0.00	Trade
Buy/Sell	2	Oct 16 2010 14.00 Call	2.37	2.43	2.43	2.43	52.28	100.00	0.00	0.00	0.00	Trade
Buy/Sell	1	Oct 16 2010 15.00 Call	0.03	0.04	0.04	0.04	45.90	0.00	0.00	0.00	0.00	Trade

1. **Evaluation Price** – To change the price of your option/stock manually, you can type in your preferred price in the Evaluation Price column.
2. **Bid/Ask** – Bid or Ask is chosen according to the strategy (Bid for Sell and Ask for Buy).
3. **Buy/Sell** – You can flip a leg (i.e., switch from Sell to Buy and vice-versa) by selecting the opposite value in the Buy/Sell column.
4. **Quantity** –Edit the desired quantity for each leg.
5. You can **remove** any leg from the calculator by click the trash can icon in the Action column.

These values displayed in the table are not available for editing.

- **Theoretical Price** – This value is calculated based on your inputs for Price, Volatility, Time to Expiration, Interest Rates, and Dividends.
- **IV (Implied Volatility)** – The calculated option implied volatility obtained by entering the current option price into the option pricing model.
- **Delta** – The sensitivity of the option price to changes in the price of the underlying.
- **Gamma** –Delta’s rate of change.
- **Theta** –The daily option price decay with time.
- **Vega** –The sensitivity of the option price to changes in Implied Volatility.

*The Greeks are represented in shares equivalent where the absolute values of the Greeks are multiplied by the standard contract size and the quantity of options selected in the QTY column.*

*Greeks are mathematical calculations used to determine the effect of various factors on options.*

## 3.2 Multi-Leg Strategies

If positions are added as a multi-leg strategy (Buy/Write, Butterfly, Condor, etc.), they will be bundled together to make it easy to place a multi-leg order. If you would like to add or delete individual legs, you will need to first click Unbundle Strategy. By doing this, the options will no longer be tradable as a multi-leg strategy. You will only be able to trade the individual legs.

[Trade Strategy](#) | [Unbundle Strategy](#) (Only individual legs may be traded)

If you want to revert back to the original strategy click Revert to Original Strategy. This will revert back to the original multi-leg strategy, which you can then pass to a multi-leg trade ticket.

[Trade Strategy](#) | [Revert to Original Strategy](#)

## 3.3 Total Position

The Total Position table shows the Greeks (sum of the Greeks for all legs) and the Bid, Ask, and Mid price for all options in the position. The Bid/Ask prices will be displayed according to the strategy (Bid for Sell and Ask for Buy).

### Total Strategy

Bid	Mid	Ask	Delta	Gamma	Theta	Vega
1.32	1.39	1.45	-100.00	0.00	0.00	0.00

## 4. Simulation Panel

### 4.1 Price, Expiration, and Volatility Changes

The screenshot shows the 'Price/Volatility' tab of a simulation panel. It features three main sections:

- 1. Evaluation Price:** A text entry field containing the value '14.40'.
- 2. Days to Expiration:** A text entry field containing '0' and a calendar icon. Below it is a horizontal slider with 'Today: 10/07/10' on the left and 'Expiration: 10/16/10' on the right.
- 3. Volatility Change:** A text entry field containing '0.00 %' and a dropdown menu set to 'Absolute'. Below it is a horizontal slider ranging from '-100%' to '100%'.

At the bottom of the panel are two buttons: 'Restore Defaults' and 'Apply'.

- 1. Evaluation Price** – To change the Evaluation Price of the underlying, simply type a number in the text-entry field. This allows you to view how price changes will influence the Net Greeks and P/L.
- 2. Days to Expiration** – To see how time to expiration affects the potential profitability, use the horizontal slider to change the expiration value. You can do this in one of three ways:
  - Type the number of days to expiration you would like to view into the field to the right of the label.
  - Move the horizontal slider along the scale with your mouse
  - Click the calendar icon to choose a date (expiration dates are highlighted).
- 3. Volatility Change** – To change the volatility assumption, use the horizontal slider on the first tab of the Simulation Panel, or type in the percentage change in volatility you would like to calculate.
  - To simulate changes in volatility in relative terms, choose Relative from the dropdown menu on the volatility slider. For example, if the current implied volatility is 20.25%, a 10% relative change in volatility would translate to 22.275% ( $20.25\% \times 0.10$  is added to the original volatility, because the relative move is positive).
  - To simulate changes in volatility in absolute terms, choose Absolute from the dropdown menu. In the example discussed above, a 10% absolute change in volatility would equal 30.25% ( $10 + 20.25$ ).

## 4.2 Interest rates

By default, we use the LIBOR rates in our P/L calculations. However, you can input your own interest rates on the second tab of the Simulation Panel to view how different interest rate assumptions will influence your results.

Expiration	Interest Rate
08/20/10	0.3288
09/17/10	0.4013
10/15/10	0.4831
01/21/11	0.7068
01/20/12	0.9398

Restore Defaults Apply

## 4.3 Dividends/Size of Contract

We provide dividends and yield numbers from our database. You can check these values and edit them in the third tab of the Simulation Panel, Dividends/Size. This window also allows editing the contract size (the deliverable quantity of stocks). By default, Contract Size is set at 100.

Dividend Amount: 0.65

Dividend Frequency: Semi-annually

Dividend Date: 05/05/2010 (mm/dd/yyyy)

Contract Size: 0.65

Restore Defaults Apply



## 5. Profit/Loss Table and Interactive Chart

### 5.1 Profit/Loss Table & Underlying Quote

In the middle of the page is a quote for the underlying stock or ETF you are modeling, plus a table summarizing the potential profits or losses given various price points. The table displays information based on today's date, as well as the other values you've entered. If you would like to simulate your breakeven(s) at expiration, set the Days to Expiration value to zero.

<b>YHOO - YAHOO INC.</b>	
<b>Last:</b> 14.40	<b>Change:</b> -3.69

**Underlying Quote**

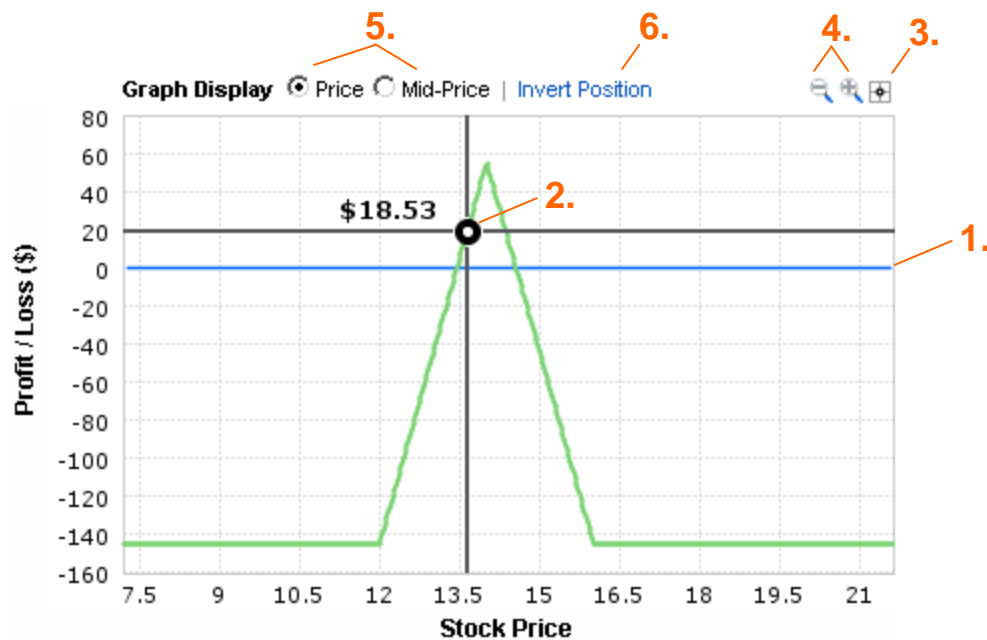
Price Points	P/L
7.50	-\$145.00
12.00	-\$144.36
13.45	\$0.00
13.50	\$5.00
14.01	\$53.96
14.55	\$0.00
15.00	-\$45.00
16.00	-\$145.00
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--	--

**Profit/Loss at various price points of the underlying**

### 5.2 Interactive Profit/Loss Chart

Once the strategy is entered into the calculator, a chart displaying profit and loss information based on today's date will appear automatically.

1. The blue zero line on the graph shows your breakeven point - i.e., where your profit/loss would equal zero.
2. When you mouse over the graph, a crosshair will appear. Use the crosshair to pinpoint your exact profits at a given price level for the underlying. If you click on the chart, it will fix the crosshair and display your profit or loss at that specific underlying price. Click the chart again to release the crosshair.
3. To disable the crosshair, click the crosshair toggle. To enable it, click the toggle again.
4. To zoom in or out on the graph, use the "+" and "-" icons. You can also drag the graph up or down, left or right, to see any portion of the picture.
5. You can graph the positions based on Price (Evaluation Price) or Mid-Price of the bid/ask.
6. You can switch legs from buy to sell and vice versa by clicking Invert Position.



## 6. Profit/Loss Calculations

Profit/Loss is calculated as follows:

$$\text{Stock\_P/L (P \& L)} = \text{Position} * (\text{Adjusted\_Price} - \text{Current\_Price})$$

Position represents the number of shares. If the trade is to sell, then the position will have a minus sign (-) otherwise it will be positive (+).

### For example:

- We sell 100 shares at the current price of \$10.
- Then, at \$11 we will have a \$100 loss because our cost basis is \$10.
- Therefore, in this example:
  - Position = -100
  - Current\_Price = 10
  - Adjusted\_Price = 11
- Plugging our example data into the formula above yields:
  - Stock\_P/L = (-100)\*(11-10) = -100

To calculate the P/L for options positions, we use the theoretical option price based on the simulated stock price. The Black-Scholes model is used for European options. The Cox-Ross-Rubenstein binomial tree model is used for all other options including American early exercise of the underlying without dividends.

The other calculations are the same as described above for the stocks but the calculated theoretical option value is the adjusted price for the position, multiplied by the contract size.

We summarize the Profit/Loss information for all legs of a strategy, and show the total values. The Profit/Loss table will display a zero Profit/Loss for the current stock price.