

Use The CBOE's Options Analysis Calculator — Gratis

Here's how to use the free option calculator offered by the Chicago Board Options Exchange to set up your positions.

by Rudy Teseo

Option strategy diagrams are the standards used in the industry to represent the curves developed in the Black-Scholes† options model. The Black-Scholes model is actually a mathematical formula that was developed in the early 1970s for calculating a fair option price, and it is still the accepted standard used today. You can get an excellent model of these computations, free of charge, on a compact disc from the Chicago Board Options Exchange (CBOE). This CD also contains a complete course in options trading.

In the CBOE model, you enter the required variables (current stock price, strike price, time to expiration, implied volatility, and current risk-free interest rate), and the model then presents a graphic display of the strategy that allows you to theorize by changing the variables.

Here's how to use this little treasure.

1 Think about having to memorize all those option definitions, and then see if a simple diagram couldn't tell you the same thing in a single glance. Cost/profit curves display the relationship between the price of the option (the premium paid or received) and the price of the underlying security (Figure 1). You can readily visualize the option price increasing and decreasing in value as the security price increases and decreases, respectively. You can also tell at a glance the risk/reward potential of this strategy.

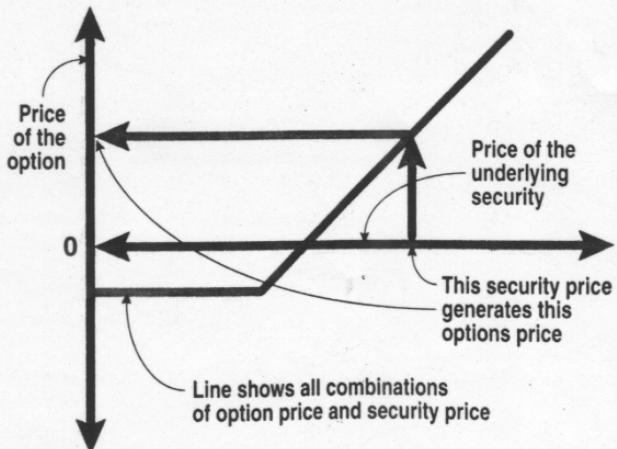


FIGURE 1: DEFINITIONS AT A GLANCE.

2

Here are the cost/profit curves (Figure 2) of the four basic strategies — long call†, short call, long put†, and short put. The term *long* means that we have bought the option; the term *short* means that we have sold the option. In the long strategies, the horizontal line below the zero line and shows that the loss is limited to the premium paid. The legs going up show that profit is unlimited, provided the stock moves in the direction expected. In the short strategies, the horizontal line is above the zero line shows that the profit is limited to the premium received from the sale of the option. The legs going down show that loss is unlimited if the stock goes against the direction expected.

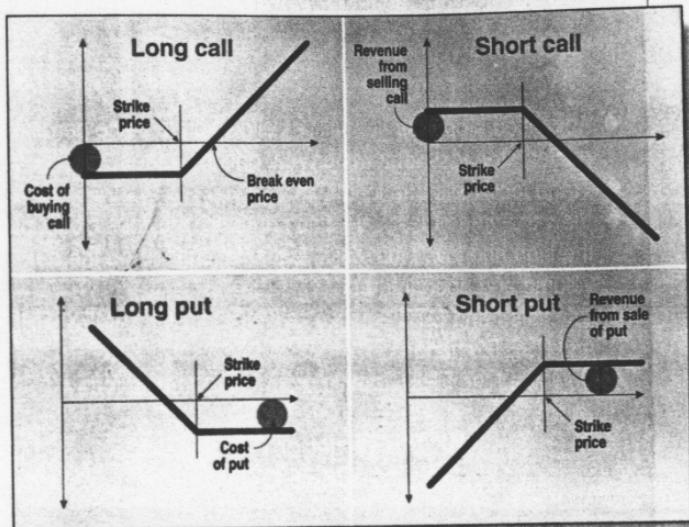


FIGURE 2: COST/OPTIONS CURVES OF THE FOUR BASIC STRATEGIES.

3

Here's the CBOE's setup screen (Figure 3). At A, I entered the stock's current price. At B, I put in the volatility. Here, you must exercise some judgment. If you input the historical volatility of a volatile stock, you are likely to get a lower option premium price than is currently quoted. I always use implied volatility in this situation, as I will explain when I discuss Figure 4. At C, you input the current risk-free interest rate. At D, you can enter the quarterly dividend rate. However, this variable has the least effect on the analysis, and I have found that inputs up to two (8% a year) have negligible effect. I leave this at zero.

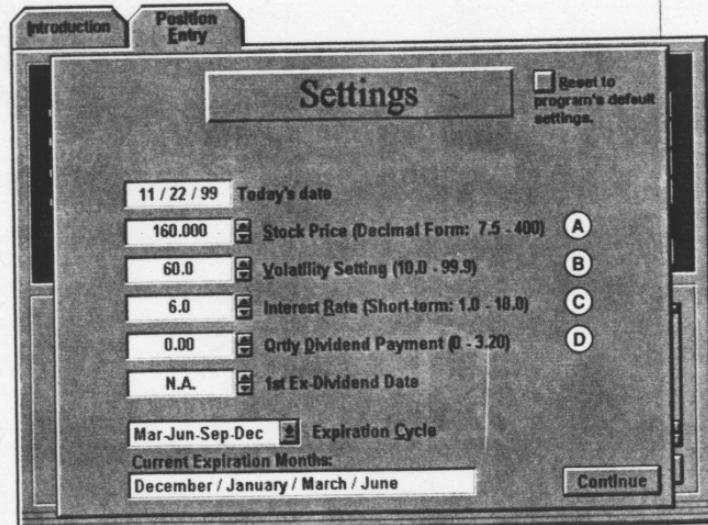


FIGURE 3: CBOE SETUP SCREEN.

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The CBOE's position input screen can be seen in Figure 4. At A, you see the current strategy that you wish to analyze. This row displays the data that you entered in the row at B. Note that the theoretical price and the option price are within four cents' range, and the default volatility and implied volatility are the same. That's because I used an implied volatility I knew to be around 60 for America Online [AOL]. If I had used an historical volatility of 50-52, which it was at the time, I would have gotten a much lower theoretical price. If this happens using your strategy, simply change the option price by getting a current quote and the volatility will change to the correct implied volatility, and the analysis will be correct. Once completed, execute.

FIGURE 4: POSITION INPUT SCREEN.

OPTIONS ANALYSIS CALCULATOR

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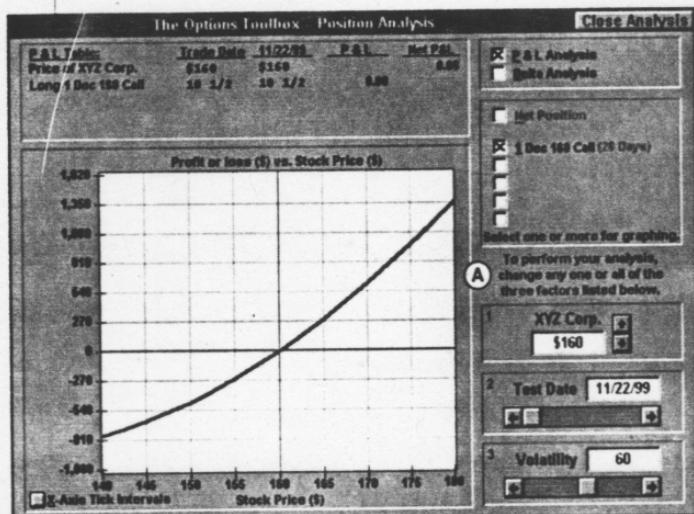


FIGURE 5: AFTER EXECUTION.

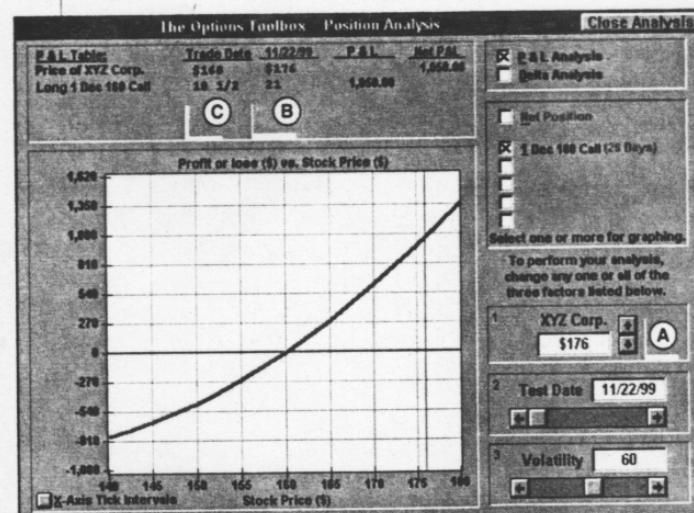


FIGURE 6: DOUBLING THE PREMIUM.

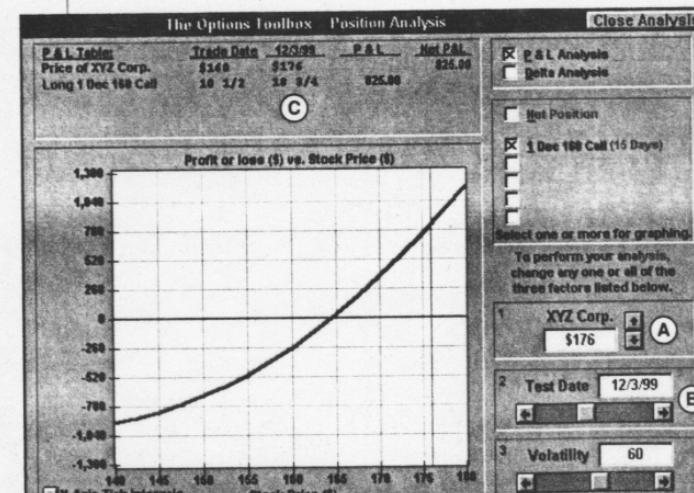


FIGURE 7: HALFWAY TO EXPIRATION.

5 After execution, the model shows the long call curve on day 1 (Figure 5). This is not a straight line, because this is not a 1-to-1 relationship now. There are two variables working on the option price: the stock price and the time decay. At A, you see the parameters that I used, and near the top, you can see the current situation. The model's line shows you the interaction of the stock price and option premium. With the model, you can do all your theorizing. In the unlikely event the stock plummeted to \$140, you see an immediate loss of almost \$810 per contract. (This is less than our maximum risk of \$1,050, so it is not a worst-case scenario.) If the stock skyrocketed 20 points to \$180, the model shows that you would have an immediate gain of \$1,350. Neither of these scenarios is likely to happen, however.

6 Next, use the options model to determine what price increase would be required for an immediate doubling of the premium (Figure 6). At point A, I increased the price until the price at point B was twice the price at point C. The price had to increase 10% (from \$160 to \$176). This might be somewhat optimistic, but the idea is you can play with this model for *any* profit you would be happy with — that is, 20% or 30%. If the stock has a good chance of appreciating 5% in the next four weeks, you would then analyze an option farther out, giving yourself another month for your objective to be reached.

To analyze a multileg strategy, input the data for each strategy as option 1, option 2, and so forth. The time you spend experimenting with this model may return a hundredfold in profits.

7 Now, to tweak the model to show the situation halfway to expiration (Figure 7). I left the price at \$176 at point A, but at point B, I changed the date to December 3, 1999. At point C, note you have a nice profit of around 80%. This is a reasonable goal, especially with AOL about to split. At the same time, you see that a \$20 drop to \$140 would cost us close to our maximum risk.

8

Finally, in Figure 8, you see the graph for this long call at expiration rather than halfway to expiration. At point A, I left the price at \$176, and at point B, I ran the date to the very end, the expiration date. (Expiration day is actually the Saturday following the third Friday.) I still show a potential profit of around 60% at point C. At point D, you see the model's curve of the long call at expiration.

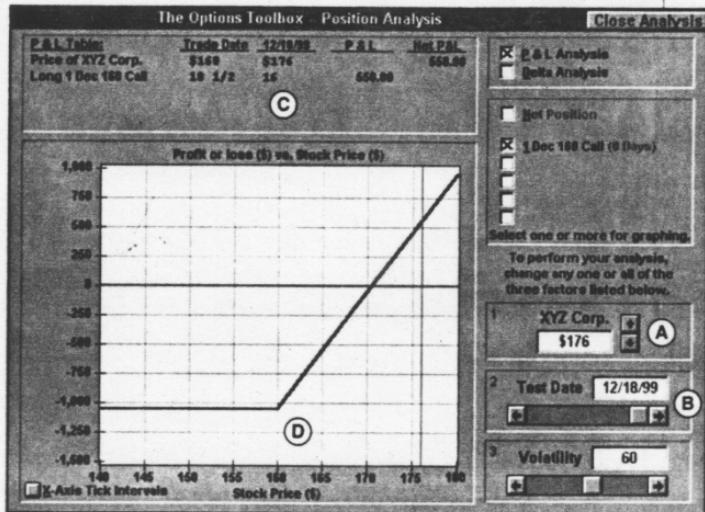


FIGURE 8: LONG CALL AT EXPIRATION.

SUGGESTIONS

To analyze any of the other basic strategies in the CBOE's options model, go to the input screen (Figure 4) and check buy put; sell call; or sell put. To analyze a multileg strategy, input the data for each strategy as option 1, option 2, and so forth. The time you spend experimenting with this model may return a hundredfold in profits.

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REFERENCES AND RESOURCES

- Chicago Board Options Exchange (CBOE). 800 678-4667 (ask for the Options Toolbox Kit).
- Chicago Mercantile Exchange (CME). 888 252-6464 (ask for the Mini Standard & Poor's 500 Options Kit).
- McMillan, Lawrence G. [1993]. *Options As A Strategic Investment*, Simon & Schuster/New York Institute of Finance.
- Trester, Kenneth R. [1998]. *The Complete Option Player*, Institute for Options Research.
- ‡Options Toolbox Kit (Chicago Board Options Exchange)

†See Traders' Glossary for definition ‡See Editorial Resource Index



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