



Maderas Golf Course, San Diego County, 9th hole. Your teacher brilliantly birdied this hole. He triple-bogied the one in the background. You should play golf to understand options because you learn how things can go from really good to really bad really quickly

## Put and Call Options

© 2002-2011 Gary R. Evans. May be used for educational purposes only without express permission of Gary R. Evans.

### Call Options ... definition of contract

Gives the owner the right to *buy* the stock from the option writer at the *strike price* on or before\* the *expiration date*.

The party who sells this contract and the right that goes with it is *writing* the call.

If the party writing the call also owns the stock, he is said to be writing a *covered call*, otherwise she is writing a *naked call*.

\* on the expiration date for European options.

## Put Options ... definition of contract

Gives the owner the right to *sell* the stock to the option writer at the *strike price* on or before\* the *expiration date*.

\* on the expiration date for European options.

Put and call options are financial assets called *derivatives*, because their value depends upon the value of the underlying asset which, by contract, they are attached - in this case, the value of the underlying stock against which the option is written.

## Reading the Options Chain

INTERNATIONAL BUSINESS MACHS COM | S&P Options Report | What's This? | IBM's stock info

Symbol	Bid	Ask	Last	Change	Change %	B/A	Size	High	Low	Volume
IBM	177.64	177.67	177.62	0.07	0.04	200X100	180.91	176.95	4,025,702	

Thu Sep 29 2011 1:58:39 PM EDT | **Out of the Money**

Calls										Puts									
Symbol	Bid	Ask	Last	Change	Vol	Op Int	Strike	Symbol	Bid	Ask	Last	Change	Vol	Op Int					
145.0 Call	33.20	34.75	35.00	1.90	0	239	145.00	145.0 Put	1.63	1.69	1.41	-0.18	62	752					
150.0 Call	29.40	29.65	24.15	-5.41	0	205	150.00	150.0 Put	2.15	2.20	1.97	-0.13	88	1,016					
155.0 Call	25.05	25.25	24.60	-0.60	0	386	155.00	155.0 Put	2.82	2.87	2.50	-0.27	95	824					
160.0 Call	20.85	21.05	21.43	0.48	0	361	160.00	160.0 Put	3.65	3.75	3.09	-0.51	56	527					
165.0 Call	16.95	17.10	17.95	1.15	51	710	165.00	165.0 Put	4.80	4.85	4.45	-0.25	374	2,446					
170.0 Call	13.30	13.45	14.05	0.75	148	692	170.00	170.0 Put	6.20	6.30	5.75	-0.35	150	983					
175.0 Call	10.05	10.15	9.95	-0.15	181	2,082	175.00	175.0 Put	7.95	8.05	7.60	-0.35	106	1,264					
180.0 Call	7.20	7.30	7.04	-0.16	131	2,293	180.00	180.0 Put	10.15	10.25	10.30	0.50	417	1,033					
185.0 Call	4.85	4.95	4.79	-0.11	350	3,540	185.00	185.0 Put	12.85	12.95	11.90	-0.85	57	1,412					
190.0 Call	3.05	3.15	2.93	-0.17	243	2,339	190.00	190.0 Put	16.05	16.20	14.45	-1.40	5	285					
195.0 Call	1.77	1.82	2.01	0.30	259	1,142	195.00	195.0 Put	19.75	19.95	18.30	-1.40	27	246					
200.0 Call	0.93	0.98	0.90	-0.04	177	1,517	200.00	200.0 Put	23.90	24.15	24.28	0.24	21	17					
205.0 Call	0.44	0.48	0.55	0.10	103	389	205.00	205.0 Put	27.15	29.45	--	0.00	0	0					
210.0 Call	0.18	0.22	0.22	0.02	4	175	210.00	210.0 Put	31.90	34.20	--	0.00	0	0					

Source: Ameritrade USA Option Chain

## Reading ... (blowup from previous page)

Mudd Finance

INTERNATIONAL BUSINESS MACHS COM									
Symbol	Bid	Ask	Last	Change	Change %	B/A Size	High	Low	Volume
IBM	177.64	177.67	177.62	0.07	0.04	200X100	180.91	176.95	4,025,702

Thu Sep 29 2011 1:58:39 PM EDT |

You can buy the IBM November 19 195 Call for \$1.82 (OOM), which gives you the right to *buy* IBM for \$195 per share between now and Nov 19.

You can buy the IBM November 19 195 Put for \$1.95 (ITM), which gives you the right to *sell* IBM for \$195 per share between now and Nov 19.

190.0 Call	3.05	3.15	2.93	-0.17	243	2,339	190.00
195.0 Call	1.77	1.82	2.01	0.30	259	1,142	195.00
200.0 Call	0.93	0.98	0.90	-0.04	177	1,517	200.00

Note: These examples assume purchases at Best Ask. Obviously you can submit a limit order at any price.

190.00	190.0 Put	16.05	16.20	14.45	-1.40	5	285
195.00	195.0 Put	19.75	19.95	18.30	-1.40	27	246
200.00	200.0 Put	23.90	24.15	24.28	0.24	21	17

Source: Ameritrade USA Option Chain

Note the big Bid/Ask spreads and the effects of limited liquidity (compare 195 Put Last to BB and BA)

Mudd Finance

## Jargon

call: in the money (ITM) if strike price < stock price  
out of the money (OTM) if strike price > stock price

put: in the money if strike price > stock price  
out of the money is strike price < stock price

In-the-money call premium = OP - (Stock price - Strike price)  
For the 175 call: 7.53 = 10.15 - (177.62 - 175.00)

In-the money put premium = OP - (Strike price - Stock price)  
For the 195 put: 2.57 = 19.95 - (195.00 - 177.62)

Out-of-the money premium = Option price (it has no intrinsic convertible value)

## Questions??

What will the Nov 195 Call be worth (currently \$1.82) on November 19 if IBM is trading at:

194.99 ?

195.80 ?

206.23 ?

What will the Nov 170 Put be worth (currently \$6.30) on November 19 if IBM is trading at

172.00 ?

168.00 ?

154.00 ?

## Buying and Selling Options Online

Suppose I want to buy the November 190 call marked below in the diagram cut from my TD Ameritrade account. To buy this option if I submit a market order it will be bought at ASK (3.15). But look at the spread between BID and ASK. I really should submit a limit order, though, at ASK or below, although if it is not at ASK it may not get executed. One option is to submit a limit order between BID and ASK, like 3.10. Another option is to target an even lower price, put in a day order and hope that the stock and the option dip down and the order executes. Also note how Bid/Ask has walked away from Last in this volatile market.

IBM Nov 19 2011		51 Days to Expiration					
Calls	Bid	Ask	Last	Change	Vol	Op Int	Strike
<a href="#">190.0 Call</a>	<a href="#">3.05</a>	<a href="#">3.15</a>	2.93	-0.17	243	2,339	190.00
<a href="#">195.0 Call</a>	<a href="#">1.77</a>	<a href="#">1.82</a>	2.01	0.30	259	1,142	195.00
<a href="#">200.0 Call</a>	<a href="#">0.93</a>	<a href="#">0.98</a>	0.90	-0.04	177	1,517	200.00

Typical online option trading interface (TD Ameritrade)

This is a limit order to buy-to-open 10 contracts of the IBM Nov 195 Call at \$2.10.

Underlying Symbol  
 [Option Chain](#) [Symbol Lookup](#)

---

Action # of Contracts Option Contract  
   [Chain](#)

---

Order Type <sup>?</sup> Price

---

Time-in-Force <sup>?</sup>

---

Instructions Routing <sup>?</sup>

**Action dropdown options:**  
 Buy to open  
 Sell to close  
 Sell to open ← *writing the call*  
 Buy to close ← *writing the call*  
 Exercise ← *use call to buy IBM*

Usually you provide no special instruction. FOK means fill within seconds or kill – a day trading order.

Ordering through *ThinkorSwim* Snap Ticket (at TD Ameritrade)

ORDER ENTRY	SNAP TICKET	ORDER QUEUE
<input checked="" type="radio"/> Buy	# of Contracts: <input type="text" value="10"/>	Price: <input type="text" value="5.55"/>
<input type="radio"/> Sell	Symbol: <input type="text" value="IBM11119C185"/>	Sp. Inst.: <input type="text" value="AON"/>
<input checked="" type="radio"/> to open	Order type: <input type="text" value="Limit"/>	Expiration: <input type="text" value="Day"/>
<input type="radio"/> to close		Routing: <input type="text" value="CBOE"/>
<input type="button" value="Review Order"/>		

An example of a *ThinkorSwim* Snap Ticket option buy order for an IBM 185 Nov Call option. This is a day limit order (at 5.50) to buy to open 10 contracts. Special instructions **AON** means **All or Nothing**, which prohibits partial fills (buying less than 10 contracts) and the special routing instructs to send this order only to the **CBOE**.

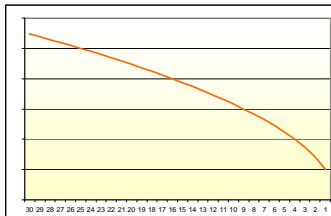
If successful, later when we offset (exit the position) we would select the **Sell** and the **to close** radio button with a new limit order at a relevant price.

If instead we wanted to *write* the option in the initial transaction, we would have chose the **Sell** and **to open** radio buttons.

## Pointers about option trades

- There is often a large spread between bid and ask, and this really cuts into option trading profits.
  - conversion to electronic trading from open outcry is helping
- Never, ever, use a market order for an option trade.
  - or you may be real surprised at the price you pay.
- Before trading an option, always check **open interest** and **volume** for liquidity.
- Once an option goes into the money or becomes profitable, it can be difficult to decide when to sell it.
  - take profits now or hope that it goes higher and pray that it doesn't fall back out of the money.

## The Premium/Price



The premium for an option converges to zero as the option approaches expiration.

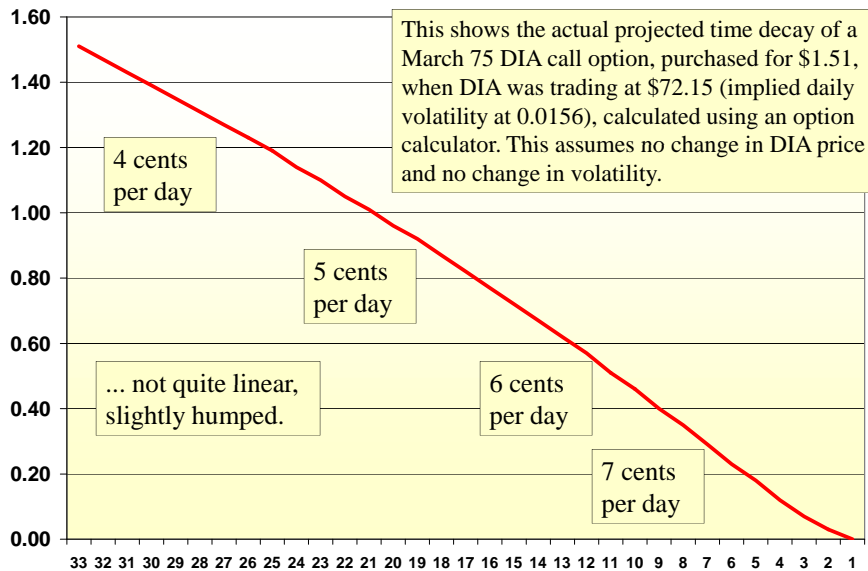
The premium of an in-the-money option can be thought of as simply the price of the option because the option has an intrinsic value of 0 at the moment.

The premium (and the price) is a function of

1. The degree to which the option is in the money (more is smaller) or out of the money (more is greater), which implies that it is a function of the underlying **price of the stock**.
2. **Time to maturity** (shorter is smaller), which implies **time decay** as time elapses.
3. The underlying stock's **volatility** (greater is larger)

## 2. Time Decay

Mudd Finance



## 3. Sensitivity to Stock Volatility

Mudd Finance



The VIX index, shown above, measures the relative volatility of the S&P 500 (and hence SPY). When the the volatility of any underlying stock rises, premiums and option prices rise with it, sometimes even enough to overcome a movement in a stock's price in the wrong direction! Note: there are many ways to measure stock volatility. The VIX is a good proxy. There are VIX ETFs – VXX is heavily traded.