PART I

Understanding Terms and Theory

As with any field of study, an understanding of the vocabulary and special terms used is essential. Options use a special language. Specific terms that you should master are noted in italics. Learning the language of options is the first step in learning how to use them.

Continuing the development of our foundation toward option understanding, we devote time to the study of the two types of options, the call and the put, and their unique risk/rewards for the investor.

From there, we move on to option theory with special emphasis on the pricing model, the Greeks, and synthetic positions.

The pricing model gives you an overview of those components that contribute to the price of options; the Greeks provide the tools necessary to manage risk; and the synthetic positions set the groundwork for the versatility of option use.

CHAPTER 1

Options Basics and Terms

An *option* is a traded security that is a *derivative product*, a product whose value is based on or derived from the price of something else. A *stock option* is based on, among other things, the price of the underlying stock. Options also exist on other traded securities, such as currencies, commodities, bonds, indexes, and interest rates.

A distinguishing factor of an option is that it is a *depreciating asset*; that is, it has a limited life. It has to be used before the date on which it expires. As time goes by, the option loses value as it moves closer to its expiration date.

When we speak of options in terms of volume, we refer to *contracts*. Each stock option contract is equivalent to 100 shares of stock. When we talk about two contracts, we are talking about 200 shares; 10 contracts, 1,000 shares; 75 contracts, 7,500 shares; and so on.

It is important to understand the *dollar cost* of options before actually trading them. When an option is quoted at $1.00 per contract, the investor must realize that the $1.00 represents a price of $1.00 per share, not per contract. Remember that each contract represents 100 shares. This means that if you buy one option contract at a quoted price of $1.00, your total cost would be $100.00 (1 contract × $1.00 per share × 100 shares per contract). If you buy 10 contracts for $1.00 per contract, your total cost will be $1,000.00. Use the following formula when calculating total dollar cost of the option, and review Table 1.1.

$$\text{Total Dollar Cost of Trade} = \text{Number of Contracts} \times \text{Price per Contract} \times 100$$

TABLE 1.1 Option Dollar Costs ($1.00 Quoted Price of Option)

Number of Contracts	×	Price per Contract	×	100 (Shares per Contract)	=	Dollar Cost of Trade
1		$1.00		100		$100.00
5		$1.00		500		$500.00
10		$1.00		1000		$1,000.00

Option contracts are literally a sales agreement between two parties. The two parties are the *buyer* (or holder) and the *seller* (or writer). When you buy an option contract, you are considered *long the option*. When you sell an option contract, you are considered *short the option*. This, of course, is assuming you have no previous position in that option.

In an option contract, although it seems as if the buyer and seller must be tied together, they are not. You see, the buyer doesn't really buy from the seller and the seller doesn't really sell to the buyer. In reality, an organization called the *Options Clearing Corporation* (OCC) steps in between the two sides. The OCC buys from the seller and sells to the buyer. This makes the OCC neutral, and it allows both the buyer and the seller to trade out of a position without involving the other party.

CALLS AND PUTS

There are two types of options, a *call option* and a *put option*.

1. A call option gives the buyer the right, but not the obligation, to buy a specific security at a specific price by a specific date. It is a way of locking in the purchase price of the stock for a period of time.
2. A put option gives the buyer the right, but not the obligation, to sell a specific security at a specific price by a specific date. It is a way of locking in the sales price of a stock for a period of time.

The specific date is known as the contract's *expiration date*. On or prior to the expiration date, the holder of the option contract has the right to exercise the option; that is, the option holder can trade out of the position at any time up to expiration in the open market.

The term *exercise* stands for the process by which the buyer of an option converts the option to a long stock position in the case of a call or a short stock position in the case of a put. Buyers of options exercise.

The term *assign* or *assignment* refers to the process by which the seller of an option is notified of the buyer's intention to exercise.

The *strike price* or *exercise price* is the price at which the holder has the right, but not the obligation, to buy (for a call) or sell (for a put), the underlying security. Strike prices are quoted in dollars; for example, May 50 calls means May $50.00 strike calls.

A *long position* is defined as any position that theoretically will increase in value, should the price of the underlying security increase. Likewise, the position theoretically will decrease in value, should the underlying security decrease. The buying of stock, the buying of a call, or the sale of a put all constitute establishment of long positions since they all represent ways that will benefit the position owner from an increasing stock price

A *short position* is defined as any position that theoretically will increase in value, should the price of the underlying security decrease. Similarly, the position theoretically will decrease in value, should the underlying security increase. The selling of stock, the selling of a call, or the buying of a put establishes a short position where all will benefit from a decrease in the underlying stock price.

CLASSES AND SERIES

The *option class* identifies the specific underlying security the option is written on. The *option series* describes the expiration month and strike price. As an example, let's use the Microsoft (MSFT) May 65 calls. MSFT is the option class (identifies the security). May 65 call is the option series. May is the expiration month, and 65 is the strike price. All segments of this option are represented by symbols. The underlying stock, month, and price have a special code.

All stocks and options are identified by *symbols*. Each stock has a specific symbol. For example, stock symbol HD = Home Depot, while MSFT = Microsoft. Options have symbols too. These symbols are standardized for all exchange-traded (listed) options. Most stock symbols match their ticker symbol. For options of the New York Stock Exchange (NYSE) and American Stock Exchange (AMEX), the option's symbol is always the same as the ticker symbol. The exceptions are the stocks of the NASDAQ. The stock symbol for NASDAQ stocks consists of four letters. Option-class symbols are limited to three letters. Symbols for NASDAQ-traded options are close to the ticket symbol but include the letter Q (to signal NASDAQ). For example, consider the computer maker Dell; its ticker symbol is DELL and

TABLE 1.2 Month Symbols

Month	Calls	Puts
January	A	M
February	B	N
March	C	O
April	D	P
May	E	Q
June	F	R
July	G	S
August	H	T
September	I	U
October	J	V
November	K	W
December	L	X

its option symbol is DLQ. The ticker symbol for Intel is INTC and its option symbol is INQ.

Another exception for the ticker symbol use is with LEAPS. Options in different years receive different class symbols to overcome the limitation of the expiration month symbol, which does not take into account the same month existing in different years. The month symbol remains the same but the class symbol changes to signify the different year.

After the option-class symbol, a different letter identifies each specific month's call or put. Table 1.2 shows which letters coincide with which month's calls and puts.

The strike price symbol (shown in Table 1.3) follows the month symbol. A letter represents each different strike price. These strike prices are also standardized for all listed options.

We are using the basics to introduce the decoding of option symbols. However, since there is a wide range of potential strike prices and a limited

TABLE 1.3 Strike Prices (Basics)

A = 5	H = 40	O = 75	V = 12.5
B = 10	I = 45	P = 80	W = 17.5
C = 15	J = 50	Q = 85	X = 22.5
D = 20	K = 55	R = 90	Y = not assigned
E = 25	L = 60	S = 95	Z = not assigned
F = 30	M =65	T = 100	
G =35	N = 70	U = 7.5	

number of letters, each letter represents more than one strike price. This fact creates the need for a bit of guesswork, but nothing too complicated when you are familiar with the basics. For instance, the letter A represents a $5 strike price but can also represent $105. The value of the stock should guide you to the meaning of the letter used. If a stock is listed for $95, the A is $105 rather than $5. When in doubt, you can go to the Option Clearing Corporation web site (www.optionsclearing.com) for a detailed explanation of the symbols.

Using Tables 1.2 and 1.3, let's decode the symbol HD GF: "HD" is the stock symbol that represents Home Depot. "G" signifies a call option with a July expiration date. "F" indicates a strike price of $30. This means that the buyer of this option has the right to purchase 100 shares of HD between now and July expiration at a price of $30 per share.

In the case of the symbol PG US, "PG" stands for the stock Procter & Gamble. The "U" signifies a put with an expiration date in September. Finally, the "S" stands for a strike price of $95. This means that the buyer of this option has the right, but not the obligation, to sell 100 shares of Procter & Gamble between now and September expiration for a price of $95 per share.

Though exceptions do exist in option symbols, when decoding, it generally helps to remember that the last letter in the group refers to strike price and the letter right before it refers to the expiration months (puts and calls).

IN THE MONEY, OUT OF THE MONEY, AND AT THE MONEY

An option can be described by the proximity of its strike price to the stock's price. An option can either be *in the money* (ITM), *out of the money* (OTM), *or at the money* (ATM). It is necessary to understand how calls and puts can be ITM, OTM, and ATM and the characteristics each carries.

At the Money

An at-the-money (ATM) option is described as an option whose exercise price or strike price is approximately equal to the current price of the underlying stock. For instance, if Microsoft (MSFT) is trading at $65.00, then the January $65.00 call would be an example of an at-the-money call option. Similarly, the January $65.00 put would be an example of an at-the-money put option.

In the Money

An in-the-money call (ITM) option is described as a call whose strike (exercise) price is lower than the current price of the underlying. An in-the-money put is a put whose strike (exercise) price is higher than the current price of the underlying (i.e., an option that could be exercised immediately for a cash credit if the option buyer wanted to exercise the option).

Using our Microsoft example, an in-the-money call option would be any listed call option with a strike price below $65.00 (the price of the stock). So, the MSFT January 60 call option would be an example of an in-the-money call. That is because at any time prior to the expiration date, you could exercise the option and profit from the difference in value: in this case $5.00 ($65.00 stock price – $60.00 call option strike price = $5.00). You could exercise your right to buy the stock at $60 and then sell it at the market price of $65, realizing a $5 gain. In other words, the option is $5.00 in the money.

Again, using our Microsoft example, an in-the-money put option would be any listed put option with a strike price above $65.00 (the price of the stock). The MSFT January 70 put option would be an example of an in-the-money put. It is in the money because at any time prior to the expiration date, you could exercise the option and profit from the difference in value: in this case $5.00 ($70.00 put option strike price – $65.00 stock price = $5.00). You can sell for a guaranteed $70 stock that you can purchase for $65. In other words, the option is $5.00 in the money.

Out of the Money

An out-of-the-money (OTM) call is described as a call whose strike price (exercise price) is higher than the current price of the underlying. Thus, the entire premium of an out-of-the-money call option consists only of extrinsic value. There is no intrinsic value in an out-of-the-money call because the option's strike price is higher than the current stock price. For example, if you chose to exercise the MSFT January 70 call while the stock was trading at $65.00, you would essentially be choosing to buy the stock for $70.00 when the stock is trading at $65.00 in the open market. This action would result in a $5.00 loss. Obviously, you wouldn't do that.

An out-of-the-money put has a strike (exercise) price that is lower than the current price of the underlying. Thus, the entire premium of an out-of-the-money put option consists only of extrinsic value. There is no intrinsic value in an out-of-the-money put because the option's strike price is lower than the current stock price. For example, if you chose to exercise the MSFT January 60 put while the stock was trading at $65.00, you would be choosing to sell the stock at $60.00 when the stock is trading at $65.00 in

TABLE 1.4 ITM, OTM, and ATM Call Determination Calculation

Strike	<, >, or =	Stock Price	Determination
55	<	65	ITM
60	<	65	ITM
65	=	65	ATM
70	>	65	OTM
75	>	65	OTM

the open market. This action would result in a $5.00 loss. This is another trade you would not want to do.

Review the ATM, ITM, and OTM option determinations by studying Table 1.4.

PREMIUM AND TIME DECAY

Premium is the total amount of money (price) you pay for an option. If the Microsoft (MSFT) May 65 calls cost you $1.50, then the $1.50 is the amount of the premium of the option. The total price of an option (premium) consists of two components: intrinsic value and extrinsic value. Be advised that many in the industry, particularly traders, use the term *premium* to represent only the extrinsic value. I mention this to help you avoid confusion about this in the future.

INTRINSIC VERSUS EXTRINSIC VALUE

Intrinsic value is the amount by which an option is in the money. In the case of a call, the intrinsic value is equal to the current stock price minus the strike price. In the case of a put, the intrinsic value is equal to the strike price minus the current stock price. **Only in-the-money options have intrinsic value.** Out-of-the-money options have no intrinsic value. For example, with MSFT trading at $65.00 the MSFT January 60 calls have $5.00 of intrinsic value. If the MSFT January 60 calls trade at $5.70, then $5.00 of that premium would be intrinsic value. At the same time, the MSFT January 70 put will also have $5.00 of intrinsic value. So, if the MSFT January 70 puts trade for $5.70, then $5.00 of that premium would be intrinsic value.

Extrinsic value is defined as the price of an option less its intrinsic value. In the case of out-of-the-money options, the entire price of the

option consists only of extrinsic value. Extrinsic value is made up of several components, the largest being volatility. In the examples given, if the MSFT January 60 calls were trading at $5.70 and $5.00 of that was intrinsic value, then the remainder ($0.70) is extrinsic value. The same also holds true for the January 70 puts. If they were trading at $5.70 and $5.00 of that was intrinsic value, then the rest ($0.70) is extrinsic value.

When we discuss *parity* in terms of options, we say that parity is the amount by which an option is in the money. Parity refers to the option price trading in unison with the stock price. **Parity and intrinsic value are closely related.** When we say that an option is trading at parity, we mean that the option's premium consists only of its intrinsic value. Remember, only ITM options can have intrinsic value; thus only ITM options can be said to be trading for parity. For call options, we can use a simple formula to decide whether an option is trading at parity. If the strike price plus the option price is equal to the current stock price, then the call is said to be trading at parity. A call is trading at parity when: strike price + option price = stock price.

For example, if Microsoft was trading at $53.00 and the January 50 calls were trading at $3.00, then the January 50 calls are said to be trading at parity. Adding the strike price (50) to the option price (3) equals the stock price (53). Under the same guidelines, the January 45 call would be trading at parity if it was trading at $8.00. The strike price of the call (45) plus the price of the call ($8) would be equal to the current stock price ($53). So parity for the January 50 calls is $3.00 while parity for the January 45 calls is $8.00.

A put option is said to be trading at parity when the strike price minus the option price is equal to the stock price. Just as with the call, any put trading with only intrinsic value and no extrinsic value is said to be trading at parity (with the stock). This means that only ITM puts can ever be trading at parity. A put is trading at parity when: strike price – option price = stock price.

For example, if IBM was trading at $71.00 and the May 75 puts were trading at $4.00, then the May 75 puts are said to be trading at parity. The strike price ($75.00) minus the option price ($4.00) would equal the stock price ($71.00). Under the same guidelines, the May 80 put would be trading at parity if it was trading at $9.00. The strike price of the put (80) minus the price of the put ($9.00) would be equal to the current stock price ($71). Therefore, parity for the May 80 puts is $9.00 while parity for the May 75 puts is $4.00.

Now, when an option, call, or put is trading for more than parity, the amount (in dollars) over parity is called *premium over parity.* Thus, this term is synonymous with *extrinsic value*, which was discussed earlier. For example, with Microsoft stock trading at $53.00 and the January 50 calls

TABLE 1.5 Intrinsic and Extrinsic Values of Calls (Stock Price $65)

Strike Price	Option Price	Status	Intrinsic Value	Extrinsic Value
50	15.10	ITM	15.00	.10
55	10.30	ITM	10.00	.30
60	5.70	ITM	5.00	.70
65	**1.50**	**ATM**	**0**	**1.50**
70	.75	OTM	0	.75
75	.35	OTM	0	.35
80	.15	OTM	0	.15

trading at $3.50, we would say that the calls are trading at $0.50 over parity. The $0.50 of the option's value over the $3.00 of parity would be the premium over parity or *extrinsic value*.

Table 1.5 (calls) and Table 1.6 (puts) show examples of several options broken down into their total price, amount of intrinsic value, and extrinsic value. When we discuss the different strategies later in the book, you will realize that understanding the amounts and the ratio of the amounts of intrinsic and extrinsic values to each other provides valuable insight in determining which options are best to use in certain strategies. Knowing particular pricing characteristics becomes very important when constructing the optimal strategy for the specific investing or trading opportunity identified.

Any discussion of the term *extrinsic value* would be incomplete without mentioning the term *time decay*. Options are considered a wasting asset due to the fact that they have a time limit attached to them (they expire at a point in time in the future). Time decay, or theta, is defined as the rate by which an option's extrinsic value (the amount of premium over parity) decays over the life of the contract. The concept of time decay is discussed in greater depth when we discuss the Greeks (Chapter 4).

TABLE 1.6 Intrinsic and Extrinsic Values of Puts (Stock Price $65)

Strike Price	Option Price	Status	Intrinsic Value	Extrinsic Value
50	.10	OTM	0	.10
55	.30	OTM	0	.30
60	.70	OTM	0	.70
65	**1.50**	**ATM**	**0**	**1.50**
70	5.70	ITM	5.00	.70
75	10.30	ITM	10.00	.30
80	15.10	ITM	15.00	.10

VOLATILITY

Volatility is defined as the degree to which the price of a stock or other underlying instrument tends to move, or fluctuate, over a period of time. A stock that has a wide trading range (moves around a lot) is said to have a high volatility. A stock that has a narrow trading range (does not move around much) is said to have a low volatility. It is important to note that volatility is a relative term. This means that high and low volatility are determined by the volatility relative to each specific underlying security. A volatility of 100 is not high in a stock that normally averages a 130 volatility level. A 30 volatility level is not low for a stock that normally averages a 15 volatility level.

Volatility is important because it has the single biggest effect on the amount of extrinsic value in an option's price. **When volatility goes up (increases), the extrinsic value of both calls and puts increases.** This makes all the option prices more expensive. The reason is quite simple. As volatility increases and the potential range of the stock expands, the uncertainty of where the stock will finish at expiration increases, thereby increasing the amount of extrinsic value.

When volatility goes down (decreases), the extrinsic value of both calls and puts decreases. This makes all of the option prices less expensive. The reasoning here is that as volatility decreases and the potential range of the stock tightens, there is less uncertainty of where the stock may finish, thus decreasing the extrinsic value of the option.

In Table 1.7 and Table 1.8, notice the comparison between similar options on fictitious XYZ Corp. at two different volatility levels. It is very important that you recognize the difference in value of the same option (calls or puts) at differing volatilities. One of the biggest mistakes a newbie in the options market can make is not understanding the contribution of volatilities to option price. Many first-timers coming from the stock market do

TABLE 1.7 Option Call Prices at 30 VOL and 70 VOL (Stock Price $65.50)

Strike Price	Call Price 30 Volatility	Call Price 70 Volatility
50	$15.60	$16.60
55	$10.70	$12.70
60	$6.38	$9.45
65	$3.13	$6.80
70	$1.21	$4.77
75	$0.38	$3.27
80	$0.09	$2.16

TABLE 1.8 Option Put Prices at 30 VOL and 70 VOL (Stock Price $65.50)

Strike Price	Put Price 30 Volatility	Put Price 70 Volatility
50	$0.01	$0.97
55	$0.12	$2.09
60	$0.74	$3.80
65	$2.47	$6.15
70	$5.56	$9.11
75	$9.75	$12.60
80	$14.50	$16.50

not realize that unlike stock prices, which ultimately are guided by one thing—movement of supply and demand—**option prices are guided by three things: movement of stock price, movement of volatility, and passage of time.**

Implied volatility, which you will hear much about, is a value derived by the option pricing model from the option's price. It indicates what the market's perception of the volatility of the stock or underlying will be during the future life of the contract. A stock that has a wide trading range (moves around a lot) is said to have a high volatility. A stock that has a narrow trading range (does not move around much) is said to have a low volatility.

The importance of volatility is that it has the single biggest effect on the amount of extrinsic value in an option's price. When volatility goes up (increases), the extrinsic value of both calls and puts increases. This makes all the option prices more expensive. When volatility goes down (decreases), the extrinsic value of both calls and puts decreases. This makes all of the option prices less expensive.