The Science of ODDS®

The Precise, Simple Profit Formula
that makes
High Accuracy Options Trading
Fast and Easy

By Don Fishback

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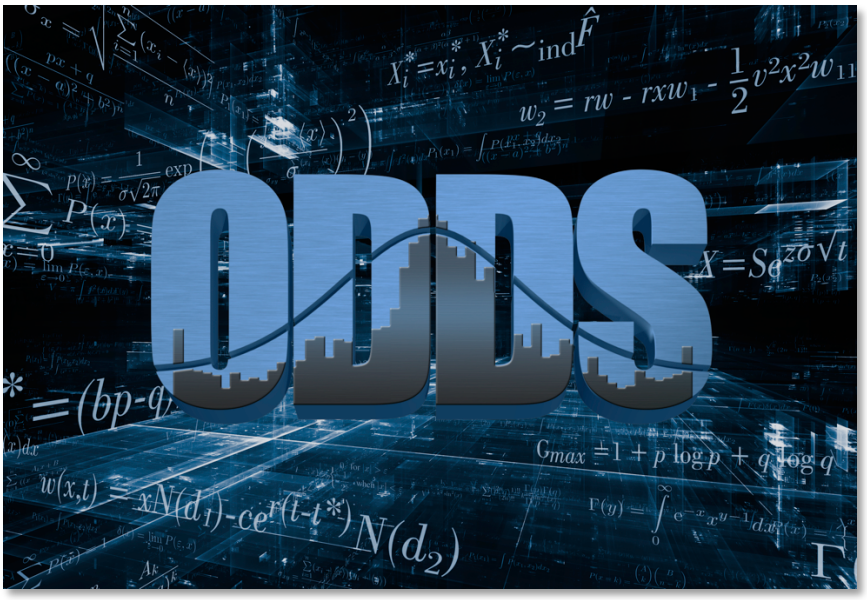
OPTIONS INVOLVE RISK AND ARE NOT SUITABLE FOR ALL INVESTORS.

PAST PERFORMANCE DOES NOT GUARANTEE FUTURE RESULTS.



Don Fishback's market comments have been featured in ...

THE WALL STREET JOURNAL. The New York Times FINANCIAL TIMES

BARRON'S CNBC npr

Active Trader Investor's Business Daily Business Insider Reuters

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Mr. Fishback was even cited as an expert on probability and its application to the financial markets in the prestigious *New England Journal of Medicine*!

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The Old-Fashioned Way To Trade Gets An Update

More than two decade ago, I embarked on a mission. That mission was to inform people on a new and different way to make money from trading. This new way of trading had a goal that was similar to an industry that was already in existence. But it was completely different from the way people normally think of making money in the financial markets.

Typically, the way to make money is to buy a stock and wait for something to happen. You buy the stock at a low price, and hopefully sell it at a higher price. You can also reverse the process and sell the stock short at a high price, and hopefully buy the stock back at a lower price. In each instance, you take a position and wait for the asset price to move. If it moves in your desired direction, you make money. If the asset price moves in the opposite direction, you lose money. The key is that something has to happen.

Options give you the flexibility to do more than just trade directionally. You can also trade non-directionally. Options make it easy to construct a strategy using options that is designed to profit no matter which direction the stock price takes. If it goes up, you can make money. If it goes down, you can make money. In this instance, the key is the size of the move. The move has to be big. The stock price has to move up big or down big. Direction doesn't matter. Size does. That means something has to happen to cause the price to move big.

That's important. Because in each of these instances, the key to making money is this: something has to happen. The asset price cannot sit still. It has to move.

A Different Way To Make Money
How To Apply A Successful Business Methods To Options Trading

In our summit presentation, we gave you a few examples of making money in the financial markets based on something happening. There is another way to make money, however, and that is to make money as long as something does *not* happen. What's surprising to many is that this idea – making money as long as something does not happen – is not new, at least with respect to the real world. It may be new to investors, but there is a centuries-old industry whose entire business is based on the concept of making money when something does not happen, and that industry is insurance.

Some say the insurance business began with the Babylonian Code of Hammurabi during the 2nd millennium B.C. The insurance industry really came into its own in London during the 1600s—first when Nicholas Barbon established a fire insurance company shortly after the Great Fire of London in 1666, and later at Edward Lloyd's coffeehouse in London in 1688. The insurance marketplace that was established at Lloyd's of London still exists today.

Insurance companies are extraordinarily profitable. Looking at the accompanying table, the latest data in available from the Insurance Service Office (www.iso.com) shows that, over the last decade, non-life insurance companies in the US alone made three quarters of a trillion dollars in profits. That's trillion with a T! No matter how you count it, that's a huge number.

Non-Life Insurance Company Profits (Health, Homeowners, Automobile, Liability, etc.)

Year	Income (billions)
2017	$36.1
2016	$42.6
2015	$56.8
2014	$55.9
2013	$63.4
2012	$35.1
2011	$19.5
2010	$35.2
2009	$28.7
2008	$3.0
2007	$62.5
2006	$63.7
2005	$44.5
2004	$38.7
2003	$30.0
2002	$3.0
2001	-$7.0
2000	$20.6
1999	$21.9
1998	$30.8
1997	$36.8
1996	$24.4
1995	$20.6
1994	$10.9
Total	$777.7

Source: Insurance Services Office, Inc.

Now that we've established that insurance companies make loads of money, I want you to think of the ways in which insurance companies make money. Insurance companies make money when something does not happen. The automobile insurance company makes money if you do not have a wreck. The homeowner's insurance company makes money if your house does not catch fire. The health insurance company makes money if you do not get sick. I want to reiterate, it's a completely different way of making money.

Now what if I told you that you could use the exact same principle to make money—that you too could make money based on something not happening? Well you can. But you won't be able to use a stock, a bond or a fund to do this. You are going to need an investment tool that has a certain characteristic. The jargon name is asymmetrical risk/reward bias. Simply put, that means unlimited reward potential with limited risk potential. The investment tool that has such a characteristic is called an option.

This e-book is going to start at the very beginning from what is an option, to the reversing the probability implied in the option pricing model to find a high probability trade.

For those of you who are brand new to options, I am going to excerpt extensively from my book, *Options For Beginners*, to explain how options work. If you've already read the book, or if you're already familiar with how options work, please feel free to skip ahead to page 37.

What Is An Option?

What is an option? Whether it is in the financial world or any other domain of our existence, quite simply, an option is exactly what its name implies – a choice. Anyone who has an option has a choice. The only thing that differentiates one option from another is defined by the possible choices. For example, a person that arrives at a fork in the road can turn right or left. They have the choice. They have an option.

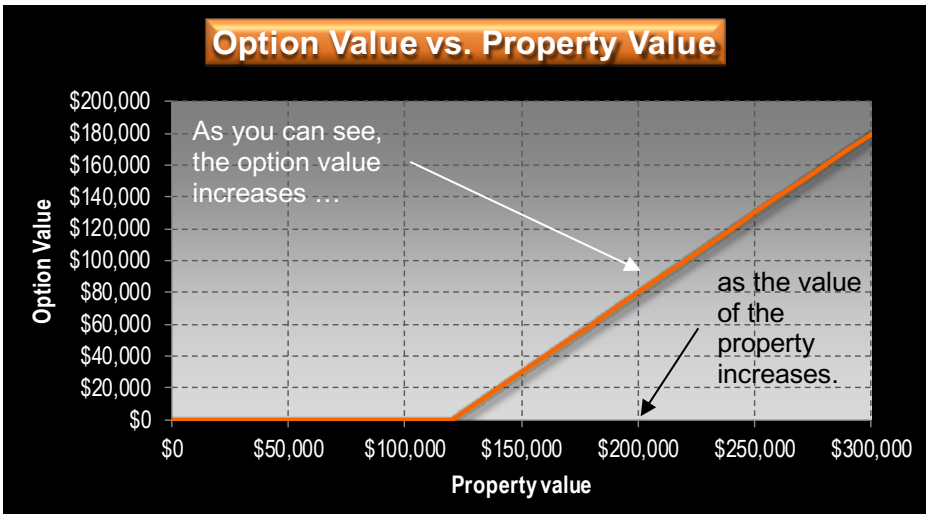
In the financial world options give the owner of the option the right to buy or the right to sell at a pre-determined price during a preset time period. As the owner of the option, you have the choice of actually buying or selling, or doing nothing. You pay someone for those rights.

In this introductory section, we're going to make extensive use of real estate as an example because of most people's familiarity with it. Later on, we'll get into another "financial asset" aspect of trading options, including options on stocks and options on stock indexes. But first, let's master the basics using something so common, nearly everyone is accustomed to it.

Let's say there is a vacant piece of farm land. The land is worth about $100,000 now. But you think there is going to be a real estate boom in the area during the next few months. You think that the land is going to be worth far more than $100,000. You go to the owner and say, "I want the right to buy this land for $120,000 at anytime during the next year." The owner says, "Okay, but I require $10,000 to grant you the option to buy my property at that price."

The reason the owner requires compensation is because he is giving up the potential for a huge profit while still carrying the bulk of the financial risk during the next 12 months.

Here's why that asset owner feels he deserves compensation: Let's say that there is a real estate bonanza, and a highway interchange gets built. Fast food restaurants and hotels start searching for building sites. They go to the owner of the land. McDonald's steps up and says, we want your land, we'll pay you $500,000. The farm land owner says, "Fine, I'd like to sell it to you. But I'm sorry, I have granted someone an option on the land for the next 12 months. I am obliged to sell it to him for $120,000 during that time. You need to talk to him." McDonald's then contacts the option holder (you) and they tell you that they want to buy the land for $500,000. You can then exercise your right to buy the land for $120,000, paying the farmer the agreed upon price, and then instantly sell the land to McDonald's for $500,000. Your profit in the deal: $380,000. Your cost: $10,000. As you can see from this calculation and the chart on the following page, the return potential is astronomical.



Let's now take a look at what happens if things don't go precisely as planned.

Let's say that the interchange gets built, but while they're digging, they come across a toxic waste dump that nobody knew about. The land is now worthless. The owner now comes to you and says, "I want you to buy the land for $120,000." But you say, "I don't care to buy it. And I have the right, but not the obligation to buy it. I choose not to exercise my right at this time."

As you can see, the land owner, at this point, is stuck with worthless property. Sure, you've lost your $10,000. But the landowner has seen his property value drop by $100,000.

This is a classic example of how options give the option buyer incredible leverage with limited downside risk. As an owner of an option, you can control an asset worth an enormous amount of money for only "pennies on the dollar". By only putting down $10,000, you can control an asset that has unlimited profit potential. Because you have so little capital tied up, yet having complete control of the asset, you can earn extraordinary returns on your money. Better still, your risk is limited to the amount of money you put up. As the example illustrates, someone who actually owns the asset has much more risk than the option owner.

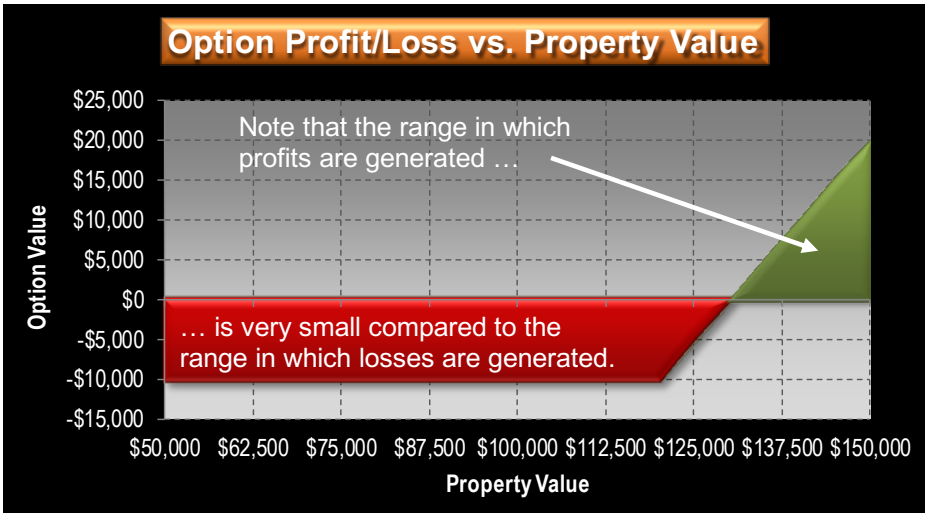
You might think, based on the following examples, that option buyers are destined for riches when they're right, and lose only a little when they're wrong. In essence, that is correct. The key, however, is how often they are right.

For example, how often is a piece of property you buy suddenly on McDonalds' real estate wish list? And how often do people discover hidden toxic waste dumps on land they wish to buy? Not very often, in either case.

Instead, the most likely scenario is that the land will increase in value, perhaps as much as 10% over the next year. That means, 12 months from now, the land will be worth $110,000. That being the case, you would not want to exercise the option, because you have the right to buy the property for $120,000. Since it is worth only $110,000, you choose not to exercise the option. [Why buy anything for $120,000 when it is only worth $110,000?] In this instance, you, the option buyer, have just lost the $10,000 you gave the option seller for the right to buy the property.

The person who sold you the option, on the other hand, has just pocketed an extra $10,000 for doing nothing more than selling you a right to do something that was unlikely to happen.

This is why, more often than not, option buyers tend to lose money.



Understanding Option Terminology

The best way to understand option market jargon is to look at and understand each component as we go along. In our real estate example, you can tell that there are certain factors that influence the price we're willing to pay for the right to buy a piece of property. Here are those factors:

1. The duration of the option.
2. The agreed upon price at which the option can be exercised (known as the strike price).
3. The current value of the asset.
4. The cost of money (i.e., interest rates).
5. The risk potential and the reward potential of the asset.

Let's look at each one of these factors individually.

The duration of the option is a factor for logical reasons. If you want to control an asset for five years instead of one year, it would naturally cost more to control it for a longer period of time. Conversely, if you wanted to control the asset for only a day, it would naturally cost less.

The reason for this is due to the fact that the longer you control the asset, the more likely it is that something can happen (there's that word again) to influence its price. For example, if you controlled the property for a day, it isn't too likely that a big real estate deal involving your property will be announced that day. Thus it isn't too likely that the price will change while you control the property with your option. If you controlled the property for ten years, however, it is quite possible that during a ten-year span some sort of real estate deal could develop. Therefore it is possible for the property to have a significant price change during the period you control it with your option. For that reason, as the duration of the option increases, the value of the option also increases.

The price at which an option can be exercised is a factor for the following reason. Let's say that you want to acquire an option to buy a piece of property. You can agree to buy the property at $100,000, or you can agree to buy the property at $200,000. If both options cost the same, which one would be more attractive? The option with the $100,000 exercise[1] price. The reason is simple.

Let's assume that the property increased in value to $150,000. If you had the right to buy the property for $100,000, you could "exercise" your right, purchase the property for $100,000, and then sell it for $150,000, thus earning a profit of $50,000. If, however, you had the right to buy the property for $200,000 and you "exercised" your right, you'd purchase the property for $200,000, sell it for $150,000, creating a loss of $50,000. Needless to say, you would not "exercise" your right to buy if you owned the option with a $200,000 exercise price. You'd do nothing because there would be no profit in it.

The fact that there would be a $50,000 profit on the option with a $100,000 "exercise" price and no profit on the option with a $200,000 "exercise" price illustrates how an option's value should increase or decrease, depending upon the agreed upon price at which the option can be exercised.

[1] An option's exercise price (also known as its strike price) is the price agreed upon by both the option buyer and the seller at which the option buyer can exercise his or her right to buy the asset (or sell, in the case of a put option [more on that later]).

The current value of the asset is an obvious factor, and here's why. Let's say that you wanted an option to buy a piece of property for $100,000 (Hint: Remember, the $100,000 figure is also known as the exercise price, or strike price) sometime during the next year. The property you're looking at is worth $20,000. During the year you own the option, property values double. The property is now worth $40,000. As the owner of the option, you still would not make money, even though real estate prices double. That's because you would never exercise your right to buy the property for $100,000 when it is worth only $40,000.

On the other hand, if the property was worth $80,000 to start, and property values doubled, the property would now be worth $160,000. As the owner of the option, you have the right to buy the property for $100,000. Therefore, you could exercise your right, buy the property for $100,000, and then sell it for $160,000, earning $60,000[2].

What this illustrates is how the current price of the asset impacts the value of the option. In both instances, the price of the asset doubled in value. But because one asset's price was higher, and, therefore, closer to the exercise price, the option had value ($60,000 at expiration). In the other instance, where the price was lower, and, therefore, further away from the exercise price, when the asset price doubled, the option had no value. Consequently, in the case of options that give you the right to buy an asset, the higher the asset's price, the more valuable the option.

Thus far, the factors we have covered are not all that startling, even to relative newcomers. The fact that time and price influence an option's value should come as no surprise. The other two factors, however, are somewhat esoteric.

The cost of money, while esoteric, is not difficult to understand. By the way, the cost of money is nothing more than the prevailing interest rate. Here's what we mean. Let's say you are contemplating buying an option on a piece of land. You are considering giving someone $10,000 for a right to buy the property over the next year. If you hold the option for a year, your $10,000 is tied up with the option seller for the entire year. That means, if your money is tied up somewhere besides an interest-bearing bank account, you are not collecting the interest on the $10,000 that you could, if you didn't buy the option. Thus, buying an option costs you lost income. If the prevailing interest rate on a one-year Treasury bill was 5%, then you'd be passing up a guaranteed $500 by buying the option. As you can see, the current rate of interest is important when valuing an option, because it represents what's known as "opportunity cost". That is, the opportunity cost of money represents how much of a guaranteed return you are passing up by investing in an option instead of a T-bill. As interest rates vary, so does that opportunity cost.

Also, from a different point of view, options allow you to control an asset without actually paying for the asset. What that means is that you don't tie up a lot of money to buy the asset itself. Instead, you can use that money to invest in an interest bearing account and earn income on those proceeds. Thus, by buying an option, you eliminate the "opportunity cost" of owning the asset.

The final factor is the reward and risk potential of the underlying asset. In our example, we were buying an option on a piece of real estate. That piece of property in our example is called the underlying asset.

In this next example, we're going to look at two different pieces of property. Property One is in the middle of a major metropolitan area; prices have already climbed substantially and the whole area is still experiencing rapid growth. Its current value is $100,000. Property Two is in

[2] Note: The $60,000 figure, the amount you would earn if you exercised your option, is called the "INTRINSIC VALUE" of an option.

the middle of the forest; there are no cities anywhere near, no roads for mining or timber equipment, and no development opportunities in the immediate future. Its current value is also $100,000.

If you could lock in a price, controlling either property and profiting from further price appreciation, while limiting your risk to an identical amount in the event real estate suddenly fell on hard times, on which property would you like to have an option?

Well, ask yourself this, "Which one is likely to climb from $100,000 to $200,000 in the next few years?" The answer to that question is obvious – the metropolitan property is more likely to double in value. That likelihood of gaining in value directly impacts an option's price.

Remember, if you buy an option, you are acquiring the right to buy an underlying asset (in this case, property) at a preset, agreed upon price during a preset, agreed upon time span. Therefore, if both properties are currently priced at $100,000, and the options on both properties are five years in duration, and in both cases, the exercise price at which the property can be purchased is $130,000, then the amount of money you would be willing to pay to control the metropolitan property should be higher than the amount you would be willing to pay in order to control the forest land.

That's because the reward potential on the metropolitan property is higher than the reward potential of the forest land. Also, the probability of reward is higher on the metropolitan property than it is on the forest property.

You see, it is reasonably certain that a good piece of commercial property will increase in value by 30% during the next five years. Therefore it is highly probable that you will be able to exercise your option for some value during the next five years, as it is highly probable that the property would be worth more than $130,000 (the price at which you have the right to buy the property, no matter how high its actual market price) during the next five years.

It is much less certain that a piece of forest land with no access roads, and with little development potential, would increase in value by 30% over the next five years. [Certainly it's possible, but not nearly as probable as the commercial property.] Therefore, it is less probable that you would want to exercise your option on the forest property than on the commercial property.

Because it is more likely that the option on the forest property will be worthless in five years, one would not want to pay as much for that option as they would for the option on the commercial property, which is almost certain to have value in five years.

Therefore, it can be stated that, all other factors being equal, options on assets with high reward potential will tend to have more value than options on assets with low reward potential. That is, the higher the reward potential (and, likewise, the higher the risk potential) of the underlying asset, the higher the price of the option.

This example illustrates how the reward potential of an underlying asset directly impacts the value of an option. Which is just one of five factors that impact the value of an option.

In review, the five factors that impact an option's value are:

1. The duration of the option.
2. The agreed upon price at which the option can be exercised.
3. The current value of the asset.
4. The cost of money (i.e., interest rates).
5. The risk potential and the reward potential of the asset (in the world of options, this is known as volatility)

These "value factors" hold true for any option on any underlying asset, whether it is real estate, stocks or even commodities.

Types Of Options And Determining Their Values - Part I – Calls

As everyone knows, there are two types of transactions – buying and selling.

There are also two types of options. So far we've covered the type that gives the buyer of the option the right to buy the asset. That type of an option is known as a call option.

It is called a "call option" because the owner of the option can do just that, call away the underlying asset. That is, the option owner can call upon the seller of the option to deliver the asset, provided the option buyer pays the agreed upon exercise price. The seller (also called the grantor) of a call option has the obligation to sell the asset to you at the preset price.

The other type of option is called a put option because it gives the option owner the right to "put" the asset in the option seller's hands. That is, the option owner has the right to sell the asset to the option seller at the agreed upon exercise price. The option seller has the obligation to buy the asset at the preset price. We'll cover this more in a later chapter.

Let's get back to an example of a call option, this time using a stock, instead of real estate, as our asset. The stock we are going to use is General Electric. We're not using GE because we feel that it is the right stock to trade. Instead, we chose GE because of its widespread familiarity. To make things simple, let's assume that GE shares are 100. We didn't choose 100 because that's the current price of GE. In fact, the current price of GE is a long way away from 100. Instead, we chose 100 because it's a nice round number. After all, it's far easier to learn about a new topic when the name is familiar and the numbers are easy to work with.

Let's say it is October. You think that the market will rally into the end of the year. General Electric shares tend to rise and fall with the market, so you think that GE will go up with the market. Let's assume GE is currently trading at 100 (the actual price of GE is not 100, but let's use this familiar stock and this nice round figure as an example). Let's also assume that you want to acquire the right to buy GE shares if they increase in value during this seasonally favorable time period. So you buy a call option with a strike price of 100 and an expiration date of December 20. Remember, the strike price is the price at which the option can be exercised. This means that you will have the right to buy GE shares at 100 before the December options expire on December 20, no matter how high or how low GE shares are.

The seller of the option, who will be obliged to deliver to you the shares of GE if you ask for them, requires compensation for giving you the right to buy GE at 100. The compensation you give him (e.g., the price of the option you pay) is called the option premium. The price of the option in October is 5. That's 1/20th of the price of the stock itself. So your out-of-pocket expenses are substantially reduced when compared to buying the stock.

Now let's fast forward to December. Let's look at what the option will be worth as GE shares fluctuate. Remember, the December call option with a strike price of 100 gives you the right but not the obligation to buy GE shares at 100 before December 20.

If GE shares are trading at 80 on the New York Stock Exchange, would you want to exercise your right, call away the stock and pay 100? Of course not. Why would you want to pay 100 when the market price of GE is 80? Therefore, when GE shares are at 80, the option has no "exercise" value. In this case, it would be worthless at expiration.

How about if GE is trading at 90? Same thing. No one would want to pay 100, as is your right, if you can buy GE in the open market at 90. Therefore, when GE shares are at 90, the option has no "exercise" value. In this case, it would be worthless at expiration.

In both instances, there is no value in exercising the option. This brings up a term that you will hear more about, "out-of-the-money". Out-of-the-money options are options that have no value if the option were to be exercised.

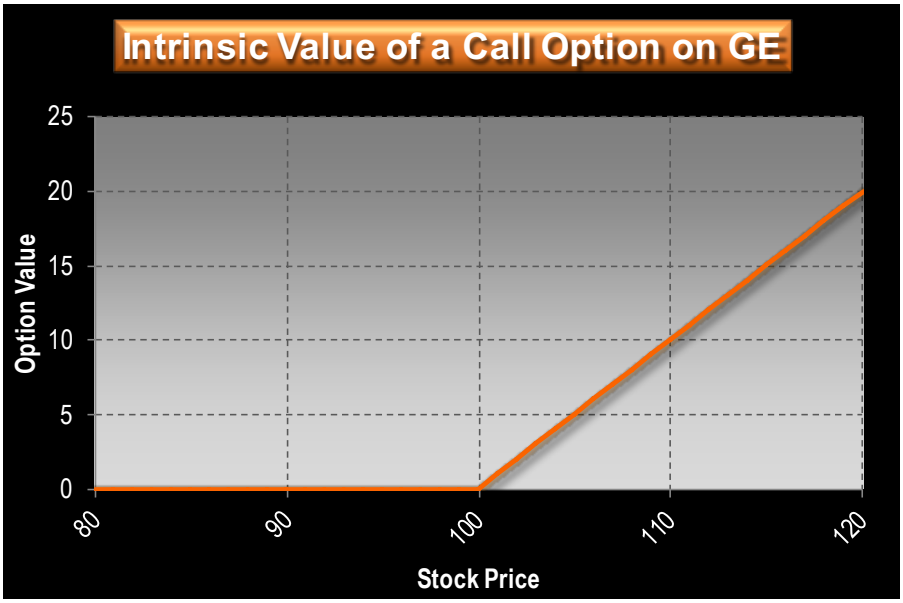
What if GE shares were at 100? In this case, it really doesn't matter. You could either buy the shares in the open market for 100, or exercise your option for 100. At the very least, one could state that there is no added value to exercising the option, so it is essentially worthless. An option whose exercise price is identical to the current market price is said to be "at-the-money".

How about 110? You could exercise your right to "call" away GE and buy it at the agreed upon exercise price of 100 and then instantly sell the shares in the open market at 110. In this case, you make 10 from exercising your option. Options that can be exercised for any value are called in-the-money options.

Finally, what happens if GE shares go to 120? Again, you could exercise your right to "call" away and buy the shares at 100, sell them at 120, making 20 from the exercise.

This "exercise value" goes by another term used by option traders. It is called "intrinsic value".

Here is a plot of the option's intrinsic value:



Notice that the call option's value is zero until the price of GE climbs above the exercise price of 100.

In this book, we are not going to get into commodity options. But I do want to say that, in most cases, they work in the very same way as stock options work. The only difference is that commodity options are options on futures contracts, not options on stocks. Therefore, if you exercise a commodity option that is not cash-settled, you will be delivered a futures contract, not shares of stock.

Types Of Options And Determining Their Values - Part II - Puts

Let's review what we've covered so far. There are two types of transactions – buying and selling. Also, we know that there is at least one type of option — a call option. A call option gives the holder of the option the right to buy. As we showed, call options tend to increase in value as the price of the underlying asset increases in value.

As you might surmise, since there is an option that gives you the right to do one type of transaction (in the case of a call option, it gives you the right to buy), there is also an option that gives you the right to do the other type of transaction. That option is called a put option.

A put option gives the holder of the option the right, but not the obligation, to sell the underlying asset at specific price during a preset period of time.

When you have the right to sell, the other party to the transaction has the obligation to buy. That is why it is called a put – because you are "putting" the asset into the hands of the option seller at the agreed upon exercise price. This causes put options to increase in value as the price of the asset drops.

Let's take a look at our earlier example of GE to see how puts work and why they gain value when the underlying asset price drops.

It is September. You know that the stock market has shown an extremely powerful seasonal tendency to drop during September and October. Because GE shares tend to rise and fall with the market, you want to own an option that rises in value when the market falls. You want to own a put option.

GE is trading at 100 in September. You want to acquire the right to sell GE shares if they drop in value, so you buy a put option with a strike price of 100 and an expiration date of October 18 (stock options and stock index options expire on the third Friday of every month). Remember, the strike price is the price at which the option can be exercised. This means that you will have the right to sell GE shares at 100 before the October options expire on October 18, no matter how high or how low GE shares are.

The seller of the option, who will be obliged to buy from you the shares of GE if you want to sell, requires compensation for giving you the right to sell GE to him at 100. The compensation you give him (e.g. the price of the option you pay) is called the option premium. The price of the option in September is 3.

Now let's fast forward to October. Let's look at what the option will be worth as GE shares fluctuate. Remember, the October put option with a strike price of 100 gives you the right but not the obligation to sell GE shares at 100 before October 18.

If GE shares are trading at 80 on the New York Stock Exchange, here's what would happen. You would have the right to sell the stock to the person who sold you the option. The price at which you would sell GE would be the exercise price of 100. Remember, the person who sells the option has the obligation to buy it from you at the preset price. Therefore, you could buy the stock in the open market at 80 and immediately sell it to the option grantor at 100, as is your right under the option. By buying GE at 80 and immediately selling it for 100, your net is 20. Therefore, the exercise value of a put option with strike price of 100 is 20 when the asset is at 80.

What about when GE is at 90? You could buy the stock at 90 in the open market, and exercise your right to sell the stock to the option grantor at 100. When you buy at 90 and sell at 100, you earn 10, which is the option's value.

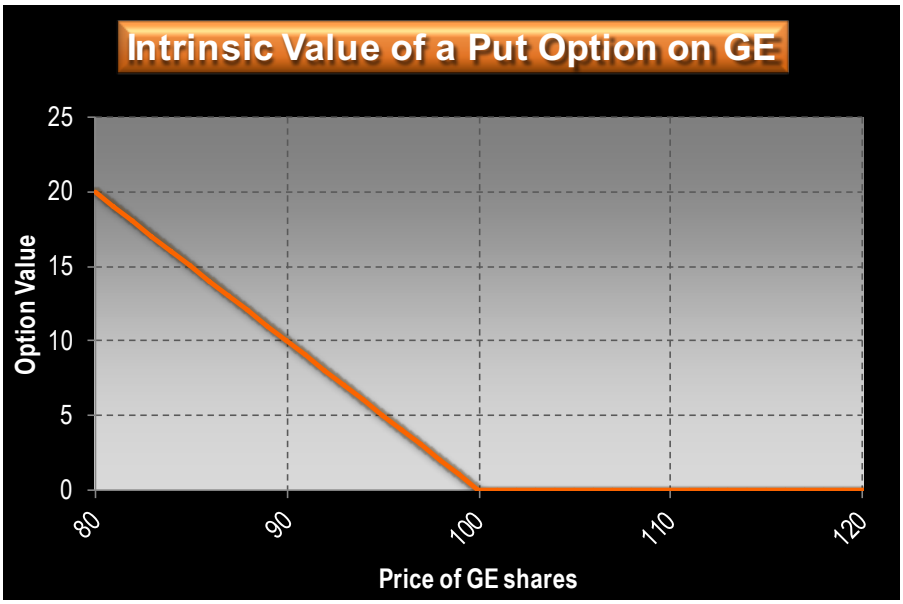
How about if GE is trading at 100? In this case, it really doesn't matter. You could buy the shares in the open market for 100, and exercise your right to sell them at 100. But that would

merely be a breakeven transaction. At the very least, one could state that there is no added value to exercising the option, so it is essentially worthless. As with a call option, any option whose exercise price is identical to the current market price is said to be "at-the-money".

How about if GE was at 110? You could exercise your right to put the stock to the option seller. But why would you? If you bought GE at 110, your right would be to sell it at 100. And why would anybody buy anything at 110, only to sell it at 100? It automatically locks in a loss of -10. Because you have the right and are not obliged to do this, you would do nothing – the option is worthless.

Finally, what happens if GE shares go to 120? Your right is to sell GE at 100. But GE shares are trading at 120. So you would have to pay 120, only to sell the shares at 100, thus locking in a loss of -20. Because you have the right and are not obliged to do this, the option is worthless.

Here is a plot of the put's intrinsic value:



As you can see through this example, a put's exercise value increases as the price of the underlying asset decreases. It does so by giving the option holder the right to sell at a predetermined price. When the price of the asset drops, the option holder can buy the asset at the current market price, put the asset into the option grantor's hands (i.e., sell it to the option grantor), and collect the agreed-upon sale price, which is the strike price of the option.

It is extremely important to note that what we've done so far is calculate the exercise value of the options. You do not need to exercise your option in order to realize a profit (e.g., turn a profit on paper into an actual profit in real dollars and cents).

As noted earlier, options are traded on major stock and commodity exchanges world wide. Traders buy and sell options all the time. Almost always, options trade at or above their exercise value (there are some rare exceptions).

Because of this, if you had an option that had an exercise value of, say, $400, you could pretty much guarantee that instead of exercising the option, you could sell it on one of the options exchanges for at least $400.

When you sell an option that you've already bought, it is called an offsetting transaction.

You can also short sell options. That is, you can sell them at the inception of the trade and buy them back later. If you sell an option short, the transaction to close out the position is a "buy" or a "purchase". That purchase is also called an offsetting transaction.

Because of the availability of offsetting transactions, few options are ever exercised. Almost all options are offset. Options that are bought are usually sold, and options that are sold short are usually repurchased. The ability to offset an "opening" transaction via a "closing" transaction is an important feature that makes it simple to trade options without worrying about the headache of actually exercising the option.

Calculating Profits And Losses On Option Trades

Up to now, we've discovered what an option is, what types of options there are, and how options gain or lose value. The next step is to determine how an option transaction impacts your bottom line.

A quick example would be, if you bought something for 3 and sold it (via an offsetting transaction) for 6, you'd have a profit of 3. This is calculated in the following manner: You spent 3 to buy something. Whenever you buy something, you pay someone, taking money out of your account, so it shows up as a debit. Once you've purchased something, you need to sell it via an offsetting transaction to turn a paper profit into a real profit. When you sell this particular item, you sell it for 6. Whenever you sell something, you get money. Money goes into your account, so it shows up as a credit. Therefore the 3 appears as a (-3) minus 3, and the 6 appears as a (+6) plus 6. Add the two together and you get the net profit (or loss). The net profit in this case is +3 (calculated by adding -3 and +6).

Simple enough, but vitally important.

In the next several sections, we will be providing you with examples that show how to calculate profits and losses on buying and selling puts and calls. Each section provides you with two examples. The thought here is that, for the novice, "practice makes perfect".

Because the examples are somewhat redundant, if at any time you feel that you understand the analysis process, feel free to skip ahead to the next chapter.

Calculating Profit And Loss Potential On A Call Option Purchase

Let's quickly review. A call option gives the option buyer the right to buy an underlying asset at a predetermined price. Also, whenever we buy something, we have to give the seller money, so money is debited from our account. When we sell, we receive money from a buyer, so money is credited to our account. After buying something, we need to sell it in order to realize a profit or loss.

Now let's look at a call option purchase. Let's take our original example: the GE call option. It is October, let's assume GE is currently trading at 100. You want to acquire the right to buy GE shares if they increase in value between now and the Christmas holidays, so you buy a call option with a strike price of 100 and an expiration date of December 20. Remember, the strike price is the price at which the option can be exercised. This means that you will have the right to buy GE shares at 100 before the December options expire on December 20, no matter how high or how low GE shares are.

The seller of the option, who will be obliged to deliver to you the shares of GE if you ask for them, requires compensation for giving you the right to buy GE at 100. The compensation you give him (e.g. the price of the option you pay) is called the option premium. The price of the option in October is 5. All stock options are worth $100 per point. Therefore the GE option costs $500. If you buy this option, it will show up on your account statement as a debit of $500 (plus commissions).

Now let's fast forward to December. Let's look at what your profit or loss will be as GE shares fluctuate. Remember, the December call option with a strike price of 100 gives you the right but not the obligation to buy GE shares at 100 before December 20.

If GE shares are trading at 80 on the New York Stock Exchange, would you want to exercise your right, call away the stock and pay 100? Of course not. Why would you want to pay 100 when the open market price of GE is 80? Therefore, when GE shares are at 80, the option has no "exercise" value. In this case, it would be worthless at expiration. If you tried to sell the option, no one would want to buy it. So you just let it expire.

If you let the options expire worthless, the transaction looks like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
GE December 100 call expires worthless	0.00
Net Profit or Loss	**-500.00**

How about if GE is trading at 90? Same thing. No one would want to pay 100, as is your right, if you can buy GE in the open market at 90. Therefore, when GE shares are at 90, the option has no "exercise" value. In this case, it would be worthless at expiration. If you tried to sell the option, no one would want to buy it. You just let it expire.

If you let the options expire worthless, the transaction look like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
GE December 100 call expires worthless	0.00
Net Profit or Loss	**-500.00**

In both instances, there is no value in exercising the option, so the options expired worthless.

What if GE shares were at 100? In this case, it really doesn't matter. You could either buy the shares in the open market for 100, or exercise your option for 100. At the very least, one could state that there is no added value to exercising the option, so it is essentially worthless. If you tried to sell the option, no one would want to buy it. You just let it expire.

If you let the options expire worthless, the transaction looks like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
GE December 100 call expires worthless	0.00
Net Profit or Loss	**-500.00**

How about 110? At 110, the options have value. You could exercise your right to "call" away and buy GE at 100 and then instantly sell the shares in the open market at 110. In this case, you make 10 from exercising your option. Also, as we showed, you could simply offset the transaction by selling the option. If you sold the option for its exercise value (10), it would show up on your account as a plus.

If you exercise your option, the transaction would look like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
Exercise the option (buy 100 shares of GE at 100)	-10,000.00
Sell 100 shares of GE at 110	+11,000.00
Net Profit or Loss	**+500.00**

If you sell the option, the transaction looks like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
Sell GE December 100 call (price 10)	+1,000.00
Net Profit or Loss	**+500.00**

Finally, what happens if GE shares go to 120? Again, you could exercise your right to "call" away and buy the shares at 100, and then sell them at 120, making 20 from the exercise. Or you could simply sell your option in an offsetting transaction.

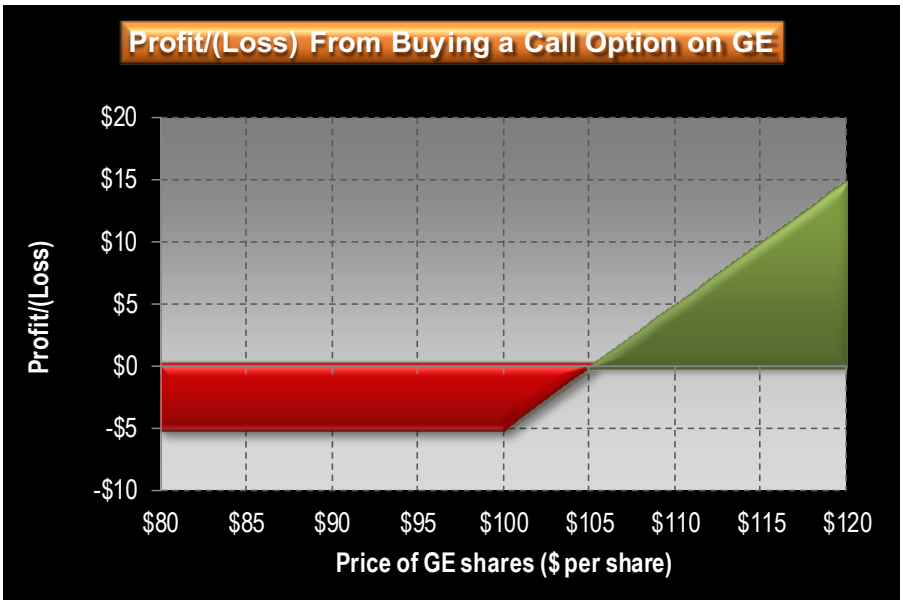
If you exercise your option, the transaction would look like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
Exercise the option (buy 100 shares of GE at 100)	-10,000.00
Sell 100 shares of GE at 120	+12,000.00
Net Profit or Loss	**+1,500.00**

If you sell the option, the transaction looks like this:

Transaction	*Result*
Buy one GE December 100 call (price 5)	-500.00
Sell GE December 100 call (price 20)	+2,000.00
Net Profit or Loss	**+1,500.00**

Here is a plot of the call option purchase's profit and loss as the price of GE fluctuates:



Remember, the option starts gaining value once GE shares start climbing above 100. But notice how the line does not cross the zero mark until the price of GE reaches 105. This is the option purchase's breakeven. In other words, if GE finishes below 105, the option buyer loses. That's because the option does not gain enough value to overcome the purchase price. If it finishes above 105, the option buyer will earn a profit.

Notice that the breakeven price is equal to the price of the option when purchased (5), plus the option's strike price (100) [5 + 100 = 105]. This is a very simple rule of thumb for calculating the breakeven of a call purchase. The breakeven of a call purchase is equal to the price of the option plus the option's strike price.

Here are the important characteristics of call buying:

1. Small cash outlay - Compared to buying the asset, the cost of a call option is much, much smaller.
2. Bullish bias - The underlying asset must go up in order for you to make money.
3. Limited risk - If you're wrong and the underlying asset declines in value, your maximum loss potential is limited to the purchase price of the option.
4. Unlimited profit potential - If you're right about direction, the profit potential is virtually unlimited. The percentage profit available is much larger than the risk potential.
5. Poor probability - As indicated at the beginning of the report, most traders find it almost impossible to accurately guess direction consistently. When you purchase an option, you not only have to be right about market direction, your forecast must take place during a limited amount of time (prior to option expiration). In other words, you must guess direction accurately and your forecast has to take place quickly.

Calculating Profit And Loss Potential On A Put Option Purchase

Let's quickly review the put option process. A put option gives the put holder the right to sell an underlying asset at a predetermined price in a preset period of time. Because of this, when an underlying asset drops in price, the put holder can buy the asset in the open market at the current price (which is now lower), and, by exercising the put, immediately sell it at a higher price (the predetermined exercise price from when the option was purchased). This gives the put owner the ability to buy low and sell high, thus giving them the ability to earn a profit.

Also, whenever we buy something, we have to give the seller money, so money is debited from our account. When we sell, we receive money from a buyer, so money is credited to our account. After buying something, we need to sell it in order to realize a profit or loss.

Let's take a look at our earlier example of GE to see how we can determine our profit and loss potential from a put purchase.

Recall from our example which showed how to determine the value of a put option, it's September. You know that the stock market has shown an extremely powerful seasonal tendency to drop during September and October. Because GE shares tend to rise and fall with the market, you want to own an option that rises in value when the market falls. You want to buy a put option.

GE is trading at 100 in September. You want to acquire the right to sell GE shares if they drop in value, so you buy a put option with a strike price of 100 and an expiration date of October 18 (stock options and stock index options expire on the third Friday of every month). Remember, the strike price is the price at which the option can be exercised. This means that you will have the right to sell GE shares at 100 before the October options expire on October 18, no matter how high or how low GE shares are.

The seller of the option, who will be obliged to buy from you the shares of GE if you want to sell them, requires compensation for giving you the right to sell GE to him at 100. The compensation you give him (e.g. the price of the option you pay) is called the option premium. The price of the option in September is 3. All stock options are worth $100 per point. Therefore the GE option costs $300. If you buy this option, it will show up on your account statement as a debit of $300 (plus commissions).

Now let's fast forward to October. Let's look at what our profit/loss will be as GE shares fluctuate. Remember, the October put option with a strike price of 100 gives you the right but not the obligation to sell GE shares at 100 before October 18.

If GE shares are trading at 80 on the New York Stock Exchange, here's what would happen. As the option buyer, you would have the right to sell the stock to the person who sold you the option at a price of 100. Remember, the person who sells the option has the obligation to buy it from you at the preset price. Therefore, you could buy the stock in the open market at 80 and immediately sell it to the option grantor at 100, as is your right under the option. By buying GE at 80 and immediately selling it for 100, your net is 20. Therefore, the exercise value of a put option with strike price of 100 is 20 when the asset is at 80. So if you exercised your option, you would earn 20 from the exercise. Also, as we showed earlier, you could simply offset the transaction by selling the option. If you sold the option for its exercise value (20), it would show up on your account as a plus.

If you exercise your option, the transaction would look like this (Remember, you bought the option for 3. Stock options are worth $100 per point):

Transaction	*Result*
Buy one GE October 100 put (price 3)	-300.00
Buy 100 shares of GE at 80	-8,000.00
Exercise the put (Sell 100 shares of GE at 100)	+10,000.00
Net Profit or Loss	**+1,700.00**

If you sell the option for 20, the transaction looks like this:

Transaction	*Result*
Buy one GE October 100 put (price 3)	-300.00
Sell GE October 100 put (price 20)	+2,000.00
Net Profit or Loss	**+1,700.00**

What about when GE is at 90? You could buy the stock at 90 in the open market, and exercise your right to sell the stock to the option grantor at 100. When you buy at 90 and sell at 100, you earn 10, which is the option's value. Also, as we showed earlier, you could simply offset the transaction by selling the option. If you sold the option for its exercise value (10), it would show up on your account as a plus.

If you sell the option for 10, the transaction looks like this:

Transaction	*Result*
Buy one GE October 100 put (price 3)	-300.00
Sell GE October 100 put (price 10)	+1,000.00
Net Profit or Loss	**+700.00**

How about if GE is trading at 100? In this case, it really doesn't matter. You could buy the shares in the open market for 100, and exercise your right to sell them at 100. But that would merely be a breakeven transaction. At the very least, one could state that there is no added value to exercising the option, so it is essentially worthless. In this case, the put option is "at-the-money". If you tried to sell the option, you would receive nothing for it. You already paid 3 for the option.

If you let the options expire worthless, the transaction looks like this:

Transaction	*Result*
Buy one GE October 100 put (price 3)	-300.00
GE October 100 put expires worthless	0.00
Net Profit or Loss	**-300.00**

How about if GE was at 110? You could exercise your right to put the asset to the option seller. But why would you? If you bought GE at 110, your right would be to sell it at 100. And why would anyone buy anything at 110, only to sell it at 100? It automatically locks in a loss of -10. Because you have the right and are not obliged to do this, the option is worthless. You paid 3 for the option.

If you let the options expire worthless, the transaction looks like this:

Transaction	*Result*

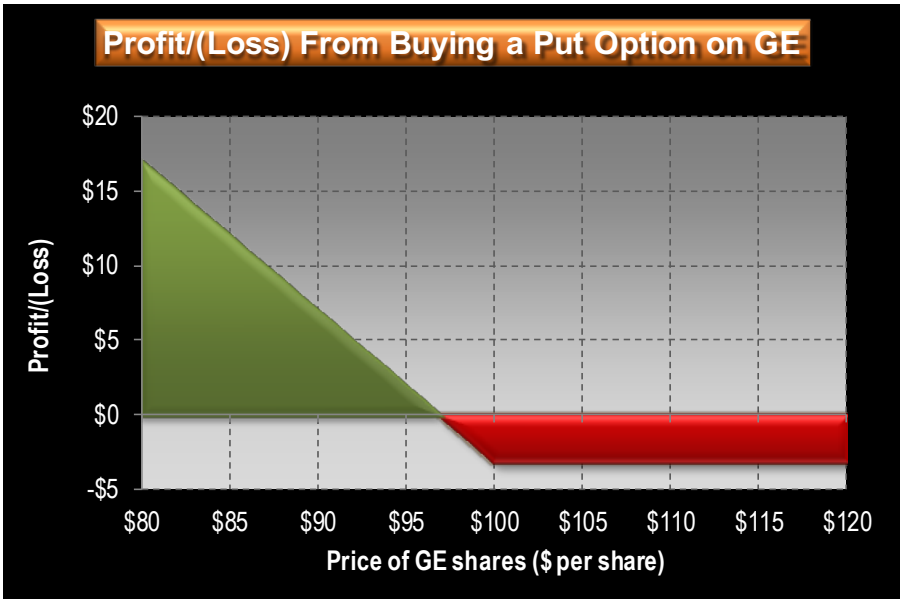
Buy one GE October 100 put (price 3)	-300.00
GE October 100 put expires worthless	0.00
Net Profit or Loss	**-300.00**

Finally, what happens if GE shares go to 120? Your right is to sell GE at 100. But GE shares are trading at 120. So you would have to pay 120, only to sell the shares at 100, thus locking in a loss of -20. Because you have the right and are not obliged to do this, the option is worthless. You paid 3 for the option.

The net result is the same as it would be if GE shares were at any price above 100. If you let the options expire worthless, the transaction looks like this:

Transaction	*Result*
Buy one GE October 100 put (price 3)	-300.00
GE October 100 put expires worthless	0.00
Net Profit or Loss	**-300.00**

Here is a plot of the put's profit and loss:



Remember, the option starts gaining value once GE shares start falling below 100. But notice how the line does not cross the zero mark until the price of GE reaches 97. This is the option purchase's breakeven. In other words, if GE finishes above 97, you lose. That's because the option does not gain enough value to overcome the purchase price. If it finishes below 97, you will earn a profit.

Notice that the breakeven price of the put is equal to the option's strike price (100) minus the price of the option when purchased (3) [100 - 3 = 97]. This is a very simple rule of thumb for calculating the breakeven of a put purchase. The breakeven of a put purchase is equal to the option's strike price minus the price of the option.

Here are the important characteristics of put buying:

1. Small cash outlay - Compared to short selling the asset, the cost of a put is much, much smaller.
2. Bearish bias - The underlying asset must drop in order for you to make money.
3. Limited risk - If you're wrong and the underlying asset gains value, your maximum loss potential is limited to the purchase price of the option.
4. Unlimited profit potential - If you're right about direction, the profit potential is virtually unlimited. The percentage profit available is much larger than the risk potential.
5. Poor probability - As indicated at the beginning of the report, most traders find it almost impossible to accurately guess direction consistently. When you purchase an option, you not only have to be right about market direction, your forecast must take place during a limited amount of time (prior to option expiration). In other words, you must guess direction accurately and your forecast has to take place quickly.

Review

We're rapidly progressing toward our goal, which is to grasp a basic understanding of options, and how they can be used to put the probabilities in our favor. Here's what we've learned so far:

1. A call option gives the option buyer the right to buy an underlying asset at a predetermined price. Because of this, when an underlying asset rises in price, the call option holder can buy the asset at a lower price (the predetermined exercise price from when the option was purchased), and immediately sell it at a higher price (the current open market price which is now higher). This gives the call owner the ability to buy low and sell high, thus giving them the ability to earn a profit.
2. A put option gives the option buyer the right to sell an underlying asset at a predetermined price. Because of this, when an underlying asset drops in price, the put holder can buy the asset in the open market at the current price (which is now lower), and immediately sell it at a higher price (the predetermined exercise price from when the option was purchased). This gives the put owner the ability to buy low and sell high, thus giving them the ability to earn a profit.
3. Whenever we buy something, we have to give the seller money, so money is debited from our account.
4. Whenever we sell, we receive money from a buyer, so money is credited to our account.
5. After buying something, we can sell it (via an offsetting transaction) in order to realize a profit or loss.
6. The breakeven at expiration of a call option is equal to the strike price plus the price of the option.
7. The breakeven at expiration of a put option is equal to the strike price minus the price of the option.
8. Buying an option offers unlimited profit potential with limited risk.
9. When you buy an option, the odds of success are against you.

Calculating Profit And Loss Potential On An Option Short Sale Part I — Selling A Call

In the previous sections, we've learned what an option is and how profits and losses from option purchases are generated. Prior to that, we learned how a trader can sell short and make money as an asset drops in price.

The next two sections are going to combine both concepts — options with short selling. That is, we're going to sell an option short at the inception of the trade. We will then close out the position by buying the option back in an offsetting transaction.

We'll also show you how this automatically puts the probabilities in your favor! First, we're going to show you what happens when you sell a call option short. In the next chapter we're going to sell a put option short.

It is very important to note that when you sell an option short, the buyer has all the rights. You, the option seller, have none. The option seller only has obligations.

When you sell a call option short, you are expecting the underlying asset to remain stable or decline in value. Here's why. When you sell a call, you are not selling short the underlying asset itself – you are selling short a call option. Remember that calls increase in value as the underlying asset increases in price. Calls drop in value as the underlying asset's price declines. Because we're selling short a call, we want the value of the call option to drop. Because a call's value drops when the underlying asset's price drops, we want the asset to drop in price!

Let's take a look at our example of GE (the one where we expect GE shares to drop) to see how we can determine our profit and loss potential from the short sale of a call option.

Recall in our bearish example that it's September. You know that the stock market has shown an extremely powerful seasonal tendency to drop during September and October. Because GE shares tend to rise and fall with the market, you want to implement a strategy that makes money when the market falls. You want to sell a call option.

GE is trading at 100 in September. Just as you would when you sell anything, you receive money when you sell an option. In this instance, when you sell a call, you receive money from the call option buyer. Whenever you receive money, you give the payer something, usually a service or a product. In this instance, you are giving the call option buyer a right. The right you are giving the call buyer is the right to buy GE shares from you at a preset price during a fixed time period. The option you sell is an October 105 call; the price of the call is 3.

The strike price of the option is 105. That means that the option buyer has the right to buy from you GE shares at 105, no matter how high or how low GE shares are. The October date means that the options expire in October (stock options and stock index options expire on the third Friday of the month). As the seller, you have received compensation from the buyer. The compensation you receive (e.g., the price of the option) is called the option premium. The price of the option in September is 3.

Now let's fast forward to October. Let's look at what the option will be worth as GE shares fluctuate. Remember, the October call option with a strike price of 105 gives the option buyer the right to buy GE shares from you at a price of 105 before October 18. Therefore, as a seller of a call option, you have the obligation to sell someone GE shares at a price of 105, no matter how high or how low the stock price actually is at the time the option is exercised.

If GE shares are trading at 80 on the New York Stock Exchange, would the option buyer want to exercise their right, call away the stock and pay 105? Of course not. Why would someone want to pay 105 when the open market price of GE is 80? Therefore, when GE shares are at 80, the option has no "exercise" value. In this case, it would be worthless at expiration.

You, the option seller, could buy back the option you sold at a price of zero, but that would generate an unnecessary commission. A more likely scenario would be for you, the option seller, and the option buyer to just let the call expire.

If the options expired worthless, the transaction, from your perspective, would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
One GE October 105 call expires worthless	0.00
Net Profit or Loss	**+300.00**

How about if GE is trading at 90? Same thing. No trader would want to pay 105 (as would be the call buyer's right) if they could buy GE in the open market at 90. Therefore, when GE shares are at 90, the option has no "exercise" value. In this case, it would be worthless at expiration. As the person who sold the call option short, you could buy it back for zero, but that would generate an unnecessary commission. A more likely scenario would be for you, the option seller, and the option buyer to just let the call expire.

If the options expired worthless, the transaction, from your perspective, would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
One GE October 105 call expires worthless	0.00
Net Profit or Loss	**+300.00**

In both instances, there is no value in exercising the option. The same thing is true if GE shares were at 100.

But what if GE shares were at the strike price — 105? In this case, it really doesn't matter. The option buyer could either buy the shares in the open market for 105, or exercise the option and buy GE shares from you at 105. If the option buyer exercised his right to buy GE shares from you, you would simply buy the stock in the open market for 105 and sell the shares to the call buyer for 105. You, however, have previously been paid for the option that you sold. In the stock portion of this transaction, you are simply buying at one price (105, the open market price) and then immediately selling the stock at the same price (105, the option's exercise price). Since there is no added value to exercising the option, it is essentially worthless. Again, as the person who sold the call option short, you could buy it back for zero, but that would generate an unnecessary commission. A more likely scenario would be for you, the option seller, and the option buyer to just let the call expire.

If the options expired worthless, the transaction from your perspective would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
One GE October 105 call expires worthless	0.00
Net Profit or Loss	**+300.00**

If you buy back the option for nothing, the transaction looks like this:

Transaction	*Result*

Sell one GE October 105 call (price 3)	+300.00
Buy back one GE October 105 call (price 0)	0.00
Net Profit or Loss	**+300.00**

If the call option buyer happened to exercise his option to buy, the transaction would look like this from your perspective:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
Buy 100 shares of GE at 105	-10,500.00
Sell 100 shares of GE at 105	+10,500.00
Net Profit or Loss	**+300.00**

How about when GE is at 110? At 110, the options have value. The option buyer could exercise his right to "call" away the stock from you and buy it at 105. This forces you to deliver the stock. If the stock is at 110, you would have to buy the stock in the open market at 110 and sell it at 105, the exercise price of the option. In this instance, you lose -5 from the exercise, but you've already collected 3, so your net loss is -2. Also, as we showed, you could simply offset the transaction by buying back the option. If you bought the option for its exercise value (5), it would show up on your account as a debit, or as a minus.

If you held the call option until the option buyer exercised it, the transaction would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
Buy 100 shares of GE at 110	-11,000.00
Sell 100 shares of GE at 105	+10,500.00
Net Profit or Loss	**-200.00**

If you bought back the call option in an offsetting transaction, it would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
Buy back one GE October 105 call (price 5)	-500.00
Net Profit or Loss	**-200.00**

Finally, what happens if GE shares go to 120? Again, the option buyer could exercise his right to "call" away and buy the shares at 105. This would force you to buy the stock in the open market at 120, then sell the shares you just bought for 120 to the option buyer at the exercise price of 105. In this instance, you lose -15 from the exercise, but you've already collected 3, so your loss is -12. Also, as we showed, you could simply offset the transaction by buying back the option. If you bought the option for its exercise value (15), it would show up on your account as a debit, or as a minus.

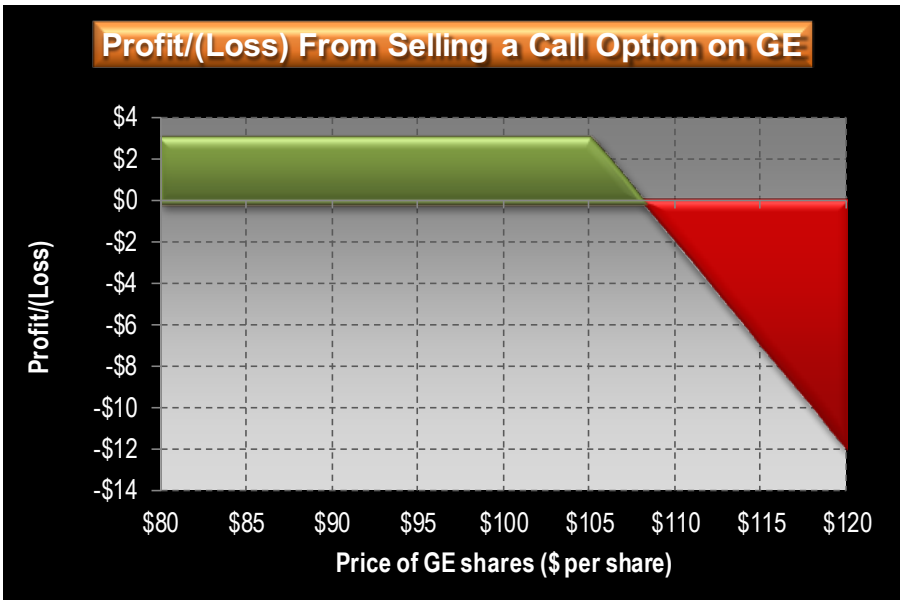
If you held the call option until the option buyer exercised it, the transaction would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
Buy 100 shares of GE at 120	-12,000.00
Sell 100 shares of GE at 105	+10,500.00
Net Profit or Loss	**-1,200.00**

If you bought back the call option in an offsetting transaction, it would look like this:

Transaction	*Result*
Sell one GE October 105 call (price 3)	+300.00
Buy back one GE October 105 call (price 15)	-1,500.00
Net Profit or Loss	**-1,200.00**

Here's a graph of the call short sale's profit and loss:



This graph is critical to understanding why the odds are in your favor when you sell an option. Remember, GE shares are trading at a price of 100. Notice that the place in which the profit/loss line drops below zero (the breakeven) is somewhere between 100 and 110. The exact price is 108 – the price of the option when you sold it, plus the strike price. As long as GE shares stay below 108, you make money. If GE shares are above 108 at expiration, the option seller loses. This is the same breakeven as the option buyer, only the option buyer wins if GE goes above 108 and loses if they are below 108 at expiration.

Notice that, if you are bearish, and the stock goes down, you make money. If you are bearish and the stock stands still, staying at 100, you still make money. If you are bearish and the stock goes up 5% to 105, you still make money. It is the location of the breakeven which is crucial to explaining why option selling has such a high probability of success. For the option seller to lose, GE shares have to rise more than 8% in less than two months (from early-September to mid-October)!! A rise of that magnitude over such a short period simply doesn't happen very often.

That means the odds of GE shares being below 108 in about 6 weeks are going to be extremely high. Consequently, because there are three possible ways in which the call option seller makes money (if GE drops any amount, if GE stands still, and if GE rises less than 8% during a six-week period) the option seller's odds of success are extremely high. On the other hand, the option buyer's odds of success are very low, as they win in only one scenario, an extremely large move upward in GE share's price.

However, as the word suggests, an extreme move is highly improbable. So the odds of suffering a loss from the sale of the call are remote. Thus, the probability is high, but so is the risk potential.

Characteristics of call selling:

1. Small cash outlay - Compared to selling the asset short, the margin requirements are reduced.
2. Slight bearish bias - The underlying asset can stand still or decline in price for you to make money.
3. Unlimited risk - If you're wrong and the underlying asset increases in value, your risk is as large as if you were selling short the asset. (The good news is that there is a solution to the unlimited aspect to the risk component, which we'll discuss in a later chapter.)
4. Limited profit potential - If you're right about direction, the profit potential is limited to the premium you receive when you sell the call.
5. High probability of profit - Selling a call option automatically puts the odds in your favor. By selling a call, the asset can drop in price, stand still, or even go up a little, and you'll still make money. The only situation in which you can lose is if the asset goes up in price by a substantial amount.

Calculating Profit And Loss Potential On An Option Short Sale Part II — Selling A Put

In the world of elementary school arithmetic, we all learned that when you multiplied a negative number by another negative number, the resulting product was a positive number.

This concept has a loose link to the final strategy we're going to look at, because we're going to combine short selling (a strategy that we showed makes money in a negative market environment) with a put option (which we showed increases in value in a negative market environment) to come up with an overall option strategy that makes money in a positive market environment!

That is, we're going to combine two negatives to create a positive.

What we're going to do is sell short a put option. When you sell short a put, you make money if the underlying asset increases in value or if it stands still. Here's why:

Remember that when you sell short, you make money if the "thing" you've sold short declines in price. That's because if the "thing" drops in price, you can buy it back for less than what you sold it for. That is, you've bought low and sold high. Only you bought and sold in reverse, selling high first and then buying low.

It is critically important that you realize what it is we're selling short when we sell a put. You are not selling short the underlying asset itself – you are selling short a put. Remember that puts increase in value as the underlying asset declines in price. Puts drop in value as the underlying asset's price rises. Because we're selling short a put, we want the value of the put to drop. Because a put's value drops when the underlying asset's price rises, we want the asset to rise in price! A few examples will obviously help.

Remember, whenever we buy something, we have to give the seller money, so money is debited from our account. When we sell, we receive money from a buyer, so money is credited to our account. After selling an option, it can either expire worthless, the option buyer can exercise his right, or it can be "bought back" in an offsetting transaction.

Let's look at stock PQR, which is trading at 100 in December. You are bullish on PQR. You expect the stock to rise in price. That means you expect the put options to drop in price. You decide to sell short a January at-the-money put. At-the-money means that the option's strike price and the stock's current price are the same. That means the option's strike price must be 100. January corresponds to the option's expiration date.

By selling a put, you are giving someone the right to sell PQR shares if they drop in value, so you sell them a put option with a strike price of 100 and an expiration date of January 19 (stock options and stock index options expire on the third Friday of every month). Remember, the strike price is the price at which the option can be exercised. This means that the buyer will have the right to sell PQR shares to you for 100 before the January options expire on January 19, no matter how high or how low PQR shares are.

As the seller of the option, you will be obliged to buy PQR shares if the buyer of the option exercises his right. You require compensation for taking on that obligation. The compensation you require (e.g. the price of the option) is called the option premium. The price of the option in December is 6.

Now let's fast forward to January. Let's look at what the option will be worth as PQR shares fluctuate. Remember, the January put option with a strike price of 100 gives the buyer the right but not the obligation to sell to you PQR shares at 100 before January 19.

If PQR shares are trading at 80 on the New York Stock Exchange, here's what would happen. The option buyer would have the right to sell the stock to you at a price of 100.

Remember, the person who sells the put option has the obligation to buy the asset at the preset price. Therefore, the option buyer could buy the stock in the open market at 80 and immediately sell it to the option grantor at 100. You, the option seller, would have to buy the stock at 100. You could then do one of two things: hang on to the stock, or, more likely, sell it in the open market where PQR shares are trading at 80.

If you hold the option you sold short until it was exercised, the transaction would look like this (Remember, you sold the option for 6. Stock options are worth $100 per point):

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
Buy 100 shares of PQR at 100 when the option is exercised	-10,000.00
Sell 100 shares of PQR at 80	+8,000.00
Net Profit or Loss	**-1,400.00**

If you choose to offset the short sale of the put by buying it back for its exercise value of 20 (the exercise value is 20 because that is how much the option buyer would get if he or she exercised their right), the transaction looks like this:

Transaction	Result
Sell one PQR January 100 put (price 6)	+600.00
Buy one PQR January 100 put (price 20)	-2,000.00
Net Profit or Loss	**-1,400.00**

What about when PQR is at 90? The option buyer could exercise the option, buy the stock in the open market at 90, then sell it to you for 100. You would have to buy the stock at 100. Like before, you could then do one of two things: hang on to the stock, or more likely sell it in the open market, in which PQR shares are trading at 90.

If you hold the option you sold short until it was exercised, the transaction would look like this (Remember, you sold the option for 6. Stock options are worth $100 per point):

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
Buy 100 shares of PQR at 100 when the option is exercised	-10,000.00
Sell 100 shares of PQR at 90	+9,000.00
Net Profit or Loss	**-400.00**

If you choose to offset the short sale of the put by buying it back for its exercise value of 10, the transaction looks like this:

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
Buy one PQR January 100 put (price 10)	-1,000.00
Net Profit or Loss	**-400.00**

How about if PQR is trading at 100? In this case, it really doesn't matter. If the option buyer exercised his option to put PQR in your hands, you'd have to buy it at 100. But you could

immediately sell it for 100. So you wouldn't have a profit or a loss on the exercise; it would merely be a breakeven transaction. Thus, there is no added value to exercising the option, so it is essentially worthless. In this case, the put option is "at-the-money". If you bought back the option, you would pay a commission, but nothing else. You already received 6 for the option when you sold it short.

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
Buy 100 shares of PQR at 100 when the option is exercised	-10,000.00
Sell 100 shares of PQR at 100	+10,000.00
Net Profit or Loss	**+600.00**

If you choose to offset the short sale of the put by buying it back for its exercise value of 0, the transaction looks like this:

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
Buy one PQR January 100 put (price 0)	0.00
Net Profit or Loss	**+600.00**

If you let the options expire worthless, the transaction looks like this:

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
PQR January 100 put expires worthless	0.00
Net Profit or Loss	**+600.00**

How about if PQR was at 110? The put buyer could exercise his right to put the stock to you at 100. But why would he? No one would ever willingly buy PQR at 110, only to sell it to you for 100. It automatically locks in a loss of -10 for him. Because he has the right but is not obliged to do this, he would just do nothing, so the option is worthless. You sold the option for 6. If the options expire worthless, the transaction looks like this:

Transaction	*Result*
Sell one PQR January 100 put (price 6)	+600.00
PQR January 100 put expires worthless	0.00
Net Profit or Loss	**+600.00**

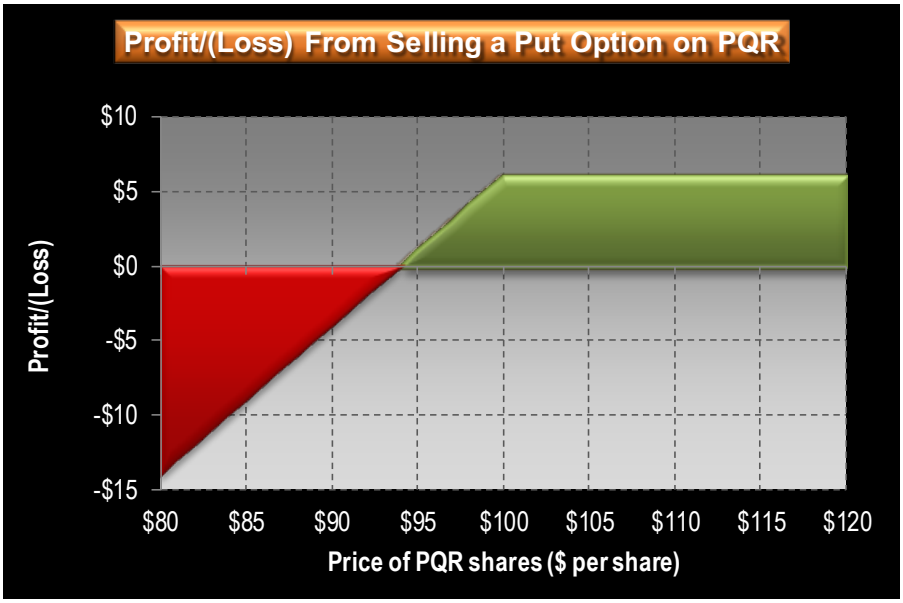
Finally, what happens if PQR shares go to 120? The put option buyer's right is to sell PQR at 100. But PQR shares are trading at 120. So he would have to pay 120, only to sell the shares at 100, thus locking in a loss of -20. Because selling is his right and not his obligation, he does nothing. Therefore, the option is worthless. You received 6 for the option.

The net result is the same as it would be if PQR shares were at any price above 100. If the options expire worthless, the transaction looks like this:

Transaction	*Result*

Sell one PQR January 100 put (price 6)	+600.00
PQR January 100 put expires worthless	0.00
Net Profit or Loss	**+600.00**

Here is a profit/loss graph showing the results from selling the put option on PQR shares:



As with the graph associated with selling a call, this graph is critical to understanding why the odds are in the put seller's favor. Remember, PQR shares are trading at a price of 100. Notice that the place in which the profit/loss line drops below zero (the breakeven) is somewhere between 90 and 95. The exact price is 94 – the price of the option when you sold it, minus the strike price. As long as PQR shares stay above 94, you make money. If PQR shares are above 94 at expiration, the option seller wins. This is the same breakeven point as for the put option buyer, only the option buyer wins if PQR shares are below 94. The option buyer loses if the shares are above 94 at expiration.

Notice that, if you are bullish, and the stock goes up, you make money. If you are bullish and the stock stands still, staying at 100, you still make money. If you are bullish and you are wrong, and the stock goes down 5% to 95, you still make money. It is the location of the breakeven which is crucial to explaining why option selling has such a high probability of success. For the option seller to lose, PQR shares have to drop more than 6% in a little more than a month! For most stocks, a drop of that magnitude over such a short period simply doesn't happen very often.

That means the odds of PQR shares being above 94 in about 5 weeks are going to be extremely high. Consequently, because there are three possible ways in which the put option seller makes money (if PQR rises any amount, if PQR stands still, and if PQR drops by less than 6% during a five-week period) the option seller's odds of success are extremely high. On the other hand, the option buyer's odds of success are very low, as he wins in only one scenario, an extremely large move downward in PQR's share price.

Characteristics of put selling:

1. Small cash outlay - Compared to buying the asset itself, the margin requirements are much smaller.
2. Slight bullish bias - The underlying asset can stand still or rise in price for you to make money.
3. Unlimited risk - If you're wrong and the underlying asset drops in price, your risk is as large as if you were buying the asset itself.
4. Limited profit potential - If you're right about direction, the profit potential is limited to the premium you receive when you sell the put option.
5. High probability of profit - Selling a put option automatically puts the odds in your favor. By selling a put, the asset can rise in price, stand still, or even go down a little, and you'll still make money. The only situation in which you can lose is if the asset goes down in price a lot.

Putting The Pieces Together

Here's what we've learned in this e-book, so far:

1. A call option gives the option buyer the right to buy an underlying asset at a predetermined price. Because of this, when an underlying asset rises in price, the call option holder can buy the asset at a lower price (the predetermined exercise price established at the time the option was purchased), and immediately sell it at a higher price (the current open market price which is now higher). This gives the call owner the ability to buy low and sell high, thus giving him the ability to earn a profit.
2. A put option gives the option buyer the right to sell an underlying asset at a predetermined price. Because of this, when an underlying asset drops in price, the put holder can buy the asset in the open market at the current price (which is now lower), and immediately sell it at a higher price (the predetermined exercise price established at the time the option was purchased). This gives the put owner the ability to buy low and sell high, thus giving him the ability to earn a profit.
3. Whenever we buy something, we have to give the seller money, so money is debited from our account.
4. Whenever we sell, we receive money from a buyer, so money is credited to our account.
5. After buying something, we can sell it (via an offsetting transaction) in order to realize a profit or loss.
6. Selling short allows an investor to sell something that he doesn't already own. By selling an asset now, he hopes that the price will drop so that he can buy back the asset at a lower price. This gives the short seller the ability to buy low and sell high, thus giving him the ability to earn a profit — only the process is reversed. The short seller sells high first, and then buys low.
7. The breakeven at expiration of a call option is equal to the strike price plus the price of the option.
8. The breakeven at expiration of a put option is equal to the strike price minus the price of the option.
9. Buying an option offers unlimited profit potential with limited risk.
10. When you buy an option, the odds of success are against you.
11. When you sell an option short, the odds are automatically in your favor.
12. The seller of an option has potentially unlimited risk.
13. Small cash outlay - Compared to trading the underlying asset itself, the margin requirements for trading options are much smaller.

So far, we've only looked at options individually. Now we're going to put the pieces together in combinations.

The reason is probability. As noted in this section, whenever you sell an option, you are putting the odds in your favor. That's because you've changed the rules of trading. When you buy a call, you make money if something happens—if the stock <u>does</u> go up past the breakeven point. If you sell a call, you make money as long as the stock <u>does not</u> go up. Likewise, if you buy a put, you make money if something does happen—if the stock <u>does</u> go down past the breakeven point. If you sell a put, you make money as long as the stock <u>does not</u> go down. If

you combine the sale of two options, as put and a call simultaneously, you put the odds in your favor even by an even greater amount.

Straddles And Strangles And Similarities To Insurance

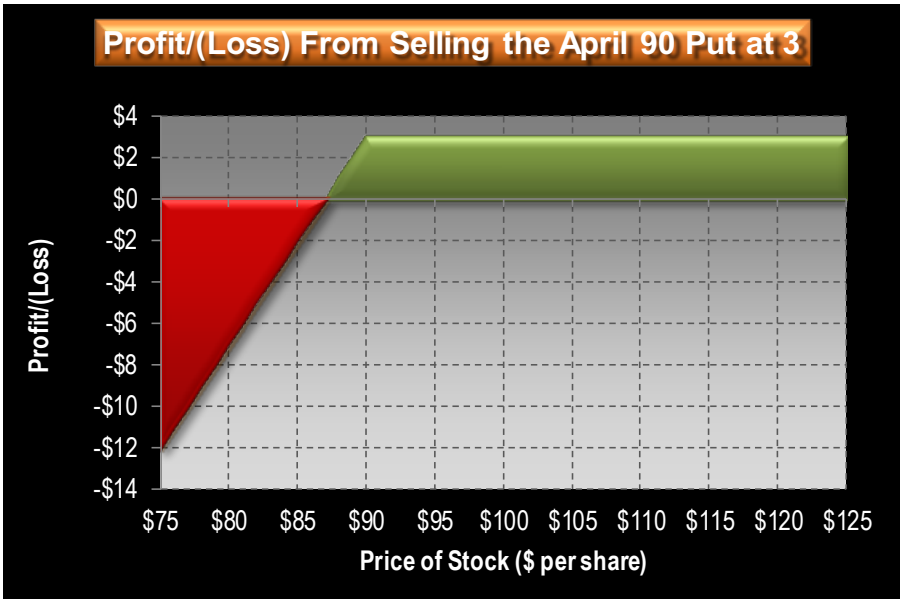
Up till now, we've been concentrating on the basics. The reason is that, like every other business, there is a certain level of industry specific jargon that is used. Everyone has to have a basic understanding of how the product works.

The good news is that we've covered most of that. Now that you've reached this point, everyone should have the necessary information to proceed to the real meat of this e-book, and that is how to use insurance-type strategies to make money when something does not happen.

When you combine a call and put together, with the same strike price and the same expiration month, it is called a straddle. If your opening transaction is to buy both options, you are buying, or going long, a straddle. If your opening transaction is selling both options, you are selling, or going short, a straddle.

If you modify the straddle ever so slightly, and use options of different strike prices, the combination is called a strangle. If your opening transaction is to buy a call and a put with the same expiration month but with different strike prices, you are buying, or going long, a strangle. If your opening transaction is to sell a call and put with the same expiration month and different strike prices, you are selling, or going short, a strangle. Let's take a look at a short strangle and a long strangle examples in detail.

Let's say that there is a stock trading at 100 on March 15 (one month prior to April option expiration). If we sell the April 90 put for 3.00, we will have another option trade that makes money as long as the stock does not drop more than 10% in one month. A few items to note in that last sentence: drop, 10% and one month. That is, direction, magnitude and duration—the major factors that influence an option's price.

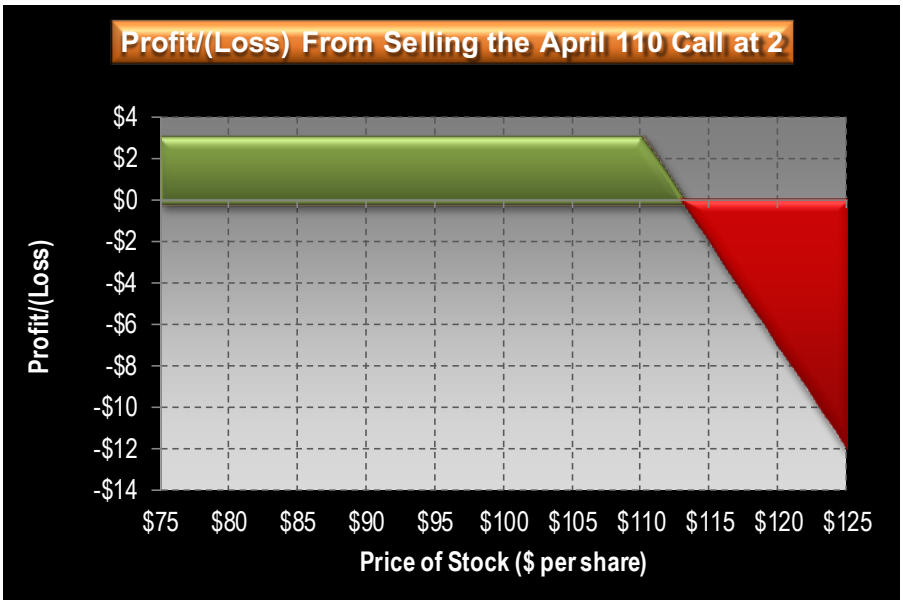


That is critical. And it's the key to why options work like insurance.

Think of it this way. Most insurance policies have a deductible. Think of the option strike price as the insurance policy's deductible. For instance, in automobile insurance, the insurance company makes its maximum profit—that is, they get to keep the entire premium you paid—under two different scenarios. First, they make their maximum profit if you do not have a wreck.

Second, they make their maximum profit even if you do have a wreck, as long as the damage does not exceed the deductible. It's the same way with an option short sale. If you sell a put, you make the maximum profit—that is, you get to keep the entire premium the option buyer paid—under two different scenarios. First, you make the maximum profit if the stock does not go down. Second, you make the maximum profit even if the stock does go down, as long as the drop does not exceed the strike price.

It's nearly identical with the short sale of a call. Let's say that same stock is at 100 on March 15, and we sell the April 110 call at 2. Here is a profit/loss graph of that call sale:



In this instance, we make the maximum profit if the stock goes down or if it stands still. We also make the maximum profit if the stock goes up a little. We make the maximum profit as long as the stock does not go up by more than 10% in one month.

The next thing to realize about insurance profits and option profits is the breakeven point. For instance, we've talked about the scenarios in which maximum profits occur. But you can make less than the maximum profit and still make money. For instance, let's say that you have a wreck. You pay your insurance company $300 a month, or $3,600 per year. You have a $1,000 deductible. It costs $4,000 to fix the car. You file a claim and the insurance company gives you $3,000, which is the damage estimate minus the deductible. In this instance, the insurance company is out $3,000. But that's after already collecting $3,600 in premiums. So they're still $600 ahead. In other words, not only does the damage have to exceed the deductible, it has to also exceed premium paid for this to be unprofitable to the insurance company.

It's similar to an option short sale. The stock has to move against you. It has to move against you by *more* than both the strike price and the premium paid in order for the trade to be unprofitable.

By now, you're probably saying to yourself, "All of this sure sounds interesting, but look at how small the profits are compared to the losses! This sure sounds good on paper, but look what happens if things don't go as planned!" At least that's what I hope you're saying, because you should be worried about the size of the losses. Fortunately, we're going to use an insurance

technique to handle that. And we'll get to that in a minute, but first, I want to solve another problem, and that is the problem of having to pick direction.

In both prior examples, the risk was biased either to the upside or the downside. That's because we were only looking at selling one option short. Let's look at what happens when we combine the short sale of the put and the call. You'll notice two things, the maximum profit increases, but there is risk in either direction.

What we've done here is change the rules. Now, the rule is: Make money as long as the stock stays within a 15% range above or below the stock during the next one-month period. The likelihood of a stock making that big of a move in that short of a time frame is low. The good news is that we can actually calculate that probability.

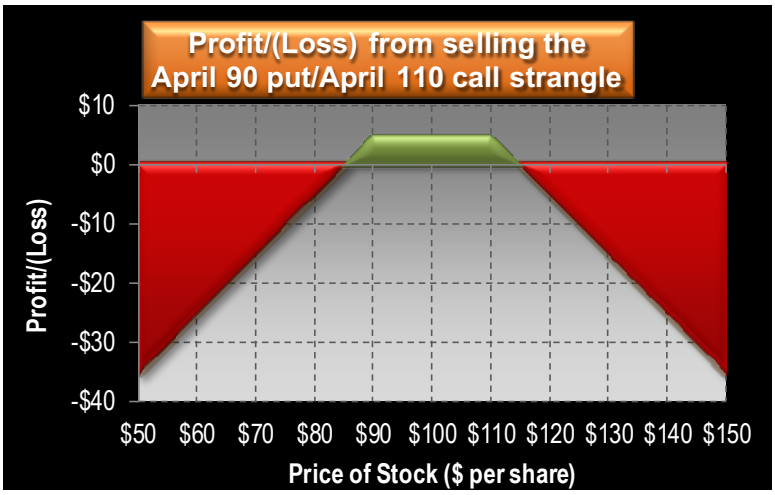
What you've essentially done when you've written a strangle is enter the insurance business; you've just written an insurance policy. The good news about going into the insurance business is that the possibility of having to pay a claim is remote. The bad news is that sometimes if you do have to pay a claim, it could be a whopper of a claim.

The same is true with selling a short strangle. When it works, it's great. But sometimes if you have to take a loss, it could be a whopper.

This unlimited risk is why many insurance companies, in order to control risk, utilize what's called reinsurance. They take some of the premium they collect and use those proceeds to buy insurance of their own. That is, they forego some profits in order to put a cap on the size of the losses that could occur if the improbable happens.

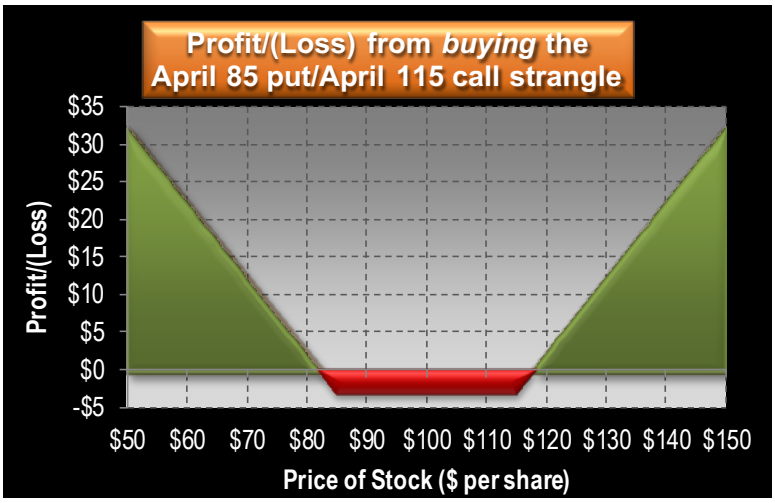
We're going to do the same thing that the prudent insurance company would do. And it's going to shock you how easy it is to do it. The strategy even has a name. The tool we're going to use that duplicates this insurance/reinsurance business model is called a credit spread. We're going to collect a premium, and then use a portion of the premium we've collected to cap our risk.

Let's first reexamine the insurance writing part. We are going to look at the same short strangle as we did in the prior example, selling the April 90 put and the April 110 call at 5.00 ($500 per spread). Below is a graph of the short strangle, this time with a wider price range.



Look at how the losses pile up in the event that you get a much bigger move than that which is expected. As an option seller, you have nothing there to protect you in the unlikely event that a stock makes an unexpected move. It's like writing an insurance policy with no cap on coverage and no reinsurance. That's horridly risky. But it's not hard to alleviate by simply following the reinsurance model and using some of the premium collected to buy protection for yourself.

To do this, let's look at the reinsurance side of the equation. The options we'd be purchasing as part of the total transaction would be further out-of-the-money (further away from the stock price) than the options we'd be selling. That means we'd be buying the April 85 put and the April 115 call in combination. The combined prices are 3 ($300). Here is a graph of the long strangle:



One look at this graph and three things should pop into your mind. First, the risk is minimal. Second, the profit potential is huge. Finally, the range in which losses occur is equally huge. The breakeven points for someone who would buy this strangle are at 82 and 118. So, while the risks are small compared to the potential profits, the odds of enjoying those profits are infinitesimally small.

But that's alright for us. Because we are not interested in the strangle purchase as a speculation. We are interested in the strangle purchase only for reinsurance purposes.

To reiterate, we are going to sell an insurance policy and use the proceeds to buy reinsurance. We are going to sell the short strangle (sell the April 90 put and the April 110 call) and buy the long strangle (buy the April 85 put and the April 115 call). We will collect 5.00 ($500) when we sell the strangle. Then we're going to use the reinsurance strategy to limit our risk. We're going to take a portion of those funds we've collected and buy a strangle, spending 3.00 ($300). The net proceeds for the entire strategy will be a credit of 2.00 ($200)—definitely smaller than $500 we get for selling the strangle. The key, however, is that we've limited our risk to only $300. That's because the maximum risk is equal to the difference between the strike prices, minus the net credit received.

Here is a graph of the combined option positions:

The lower breakeven price is the strike price of the put sold (90) minus the net credit (2), 90 - 2 = 88. That's 12% below the stock price of 100. The upper breakeven price is the strike price of the call (110) sold plus the net credit (2), 110 + 2 = 112. That's 12% above the stock price of 100.

With a maximum profit of $200 and a max loss of $300, the lower reward and maximum risk is one thing you have to be aware of when evaluating a combination such as this and compare it to an alternative strategy; the spread tends to look good only when you are comparing it to the catastrophically improbable. It looks bad when the probable happens.

In other words, if the probable happens and the stock price moves less than 12%, getting a higher reward of $500 and taking on potentially unlimited risk via a short strangle looks great in hindsight. But if the improbable occurs and the stock moves, say 35%, you're out of business.

With the reinsurance strategy, the profits are not as great. But if the improbable does happen, you're not out of business. You won't win. But the loss won't be so devastating that it wipes you out. You'll be around to trade another day.

This strategy has a couple of different names: the iron condor spread and the 4-way.

More Similarities To Insurance
Option Values Compared To Insurance Premiums

We've covered a lot of territory so far. In an earlier chapter, I noted that there are five factors that influence an option's price. Here are those factors:

1. The duration of the option.
2. The agreed upon price at which the option can be exercised (known as the strike price).
3. The current value of the asset.
4. The cost of money (i.e., interest rates).
5. The risk potential and the reward potential of the asset.

The same sorts of factors impact an insurance policy's price. We've already talked about the strike price as it compares to the deductible. One factor that's a factor but not commonly thought of because so many policies automatically renew is the duration. The longer the policy is in force, the more expensive the premium will be.

The final factor is the one that's truly interesting. The risk and the reward potential. This is where the actuaries make their money.

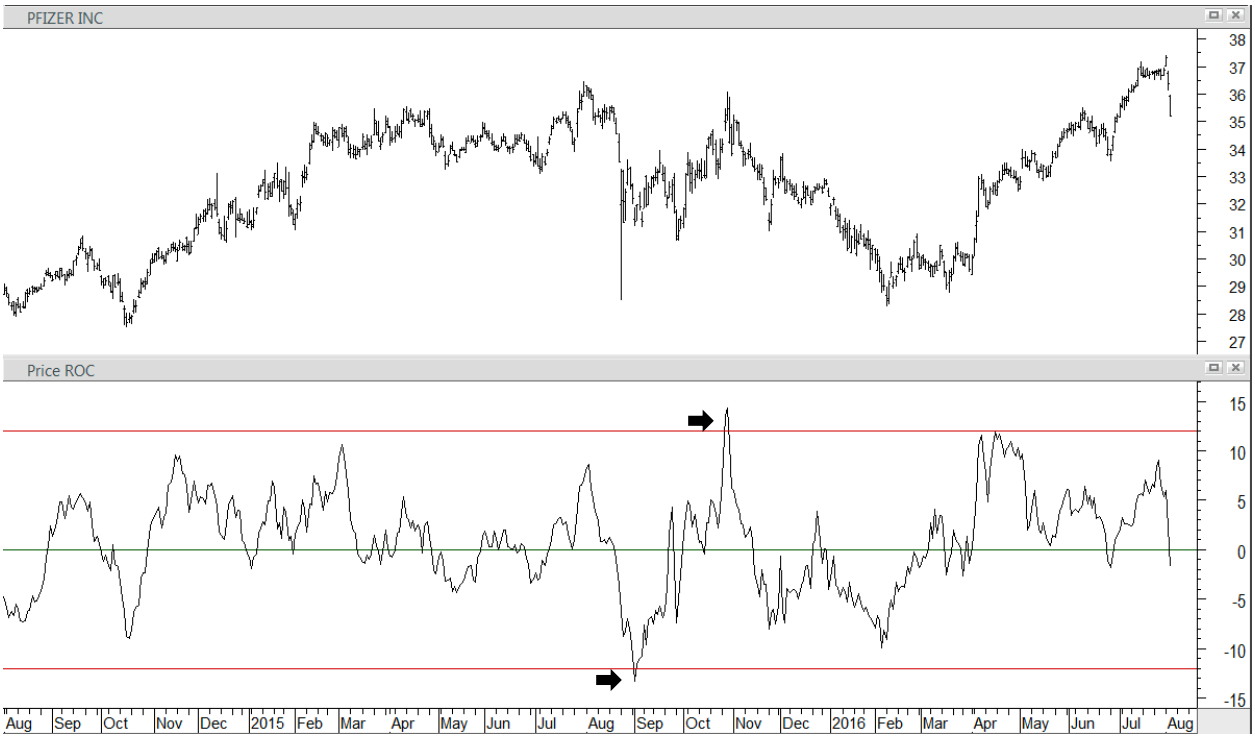
Let's say you are looking at two different people to insure. One is a high school boy with a bad driving record and a tricked-out car, and the other is a middle-aged man with a wife and two kids and a minivan in the garage. Let's say that there is only one type of insurance policy to choose from: the same coverage, the same cap on maximum coverage, the same deductibles, everything is identical except the person who is buying the insurance. Who is going to pay more for their insurance, the high school boy or the middle-aged man?

Of course it's the high school boy. The reason is that he is more likely to get into a wreck. The risk is identical in insuring both males. That's because the insurance caps are the same. The difference is the probability that the insurance company will have to write a check.

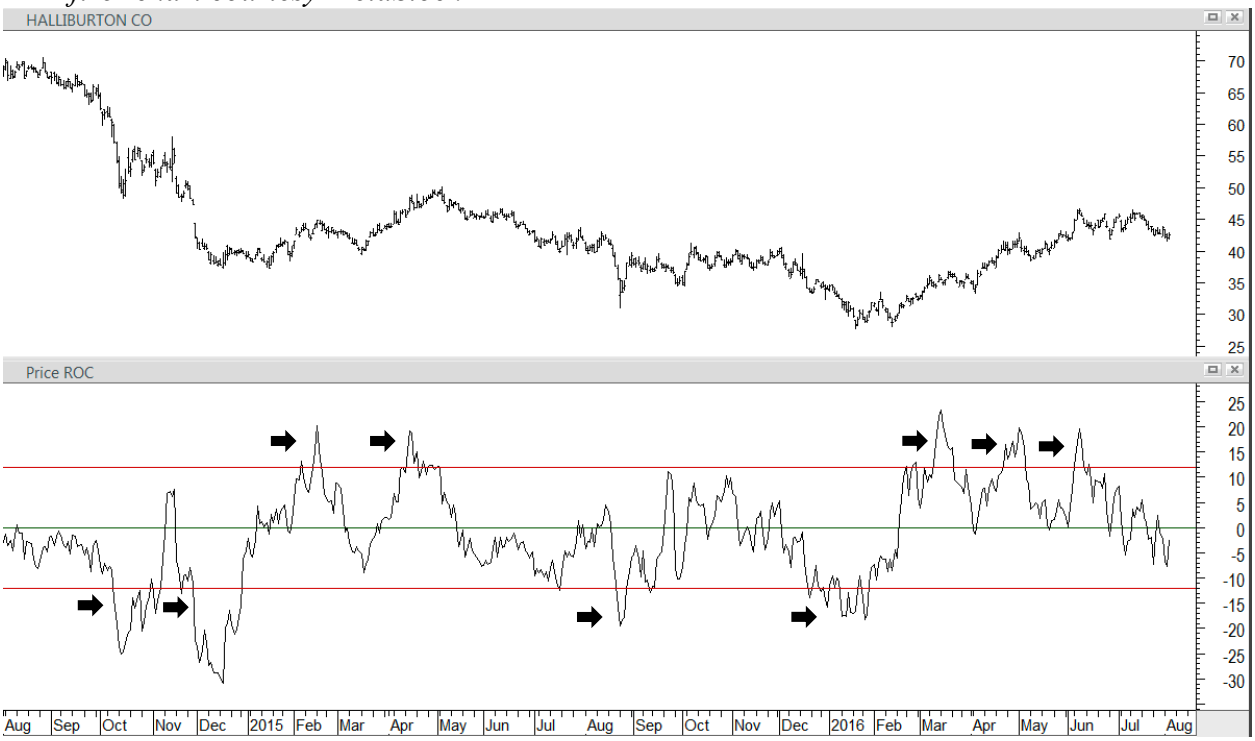
Now let's look at a stock. Let's say you are looking at two different companies. One is a high-flyer like Halliburton (HAL) that makes huge moves up and huge moves down. The other is a stable, steady plodder like Pfizer (PFE).

Remembering our 4-way spread example from before where the breakeven was 12% above and below the stock price, which stock is most likely to move 12% in a month, HAL or PFE?

The following charts provide the answer. There are two charts, one for each stock. Each stock has a bar chart and an indicator chart. The indicator shows the one-month percent change. For instance, when the indicator is at 10, that means the stock price is 10% above the level it was at a month ago. When the indicator is less than 10, that means the stock price is 10% below the level it was at a month ago. The lines drawn are at + /– 12%.



Pfizer chart courtesy MetaStock



Halliburton chart courtesy MetaStock

Looking at PFE first, there are only two times in which PFE moved significantly more than 12% in a one-month period. This is the equivalent of the good driver. It does not have wrecks that exceed the deductible very often. Looking at HAL, however, there are numerous times in which HAL moved more than 12% in a one-month period. In fact, there are four instances in

which HAL moved more than 20%! In insurance terms, HAL is the bad driver. Halliburton's stock price has wrecks whose losses exceed the deductible frequently. Now remember, because we would be writing a limited-risk insurance policy, our losses would not have gotten any worse no matter how much damage the bad driver did. But that bad driver would file a claim far more often than the good driver. And that's why buying an insurance policy of HAL would be more expensive than buying an insurance policy on PFE. HAL has many more big moves than PFE has; HAL does not stand still as often as PFE.

And that's the key to that final factor influencing an option's price: risk and reward potential. As noted in the prior paragraphs, the likelihood of a big move is what determines the probability that an option buyer will be able to file a claim. The likelihood of a big move is what determines the probability that an option seller will have to pay a claim. In the case of HAL, there is a good chance that the stock will have a big move. There is also substantial risk potential in HAL shares; the stock has had some major moves to the downside. There has also been some reward potential in HAL. During one period in the first half of 2016 the stock shot up nearly 60%.

In other words, in layman's terms, risk and reward potential implicitly mean the potential size of the stock's moves. Big moves mean big reward potential and big risk potential. Small moves mean low risk potential and low reward potential.

There is another term for the size of a stock's move, and that is volatility. Volatility is a standardized measure of the likelihood that the stock will make a move of a certain magnitude.

Now think back to the driver scenario. The reason that an insurance policy on a teenage boy is more expensive than a middle-aged, minivan-driving man is because the odds are higher that the teenage boy will have a wreck and file a claim than the older man.

The reason that HAL options will be more expensive than PFE options is because HAL's share price makes many more big moves than PFE's. That is, it is far more likely that HAL shares will move 12% in a month than PFE shares. HAL's volatility is higher than PFE's.

The Mathematical Definition Of Volatility

The next section is going to get a little hairy with the math. There is one important thing I want you to realize, as long as you have software that can make these calculations, you do not need to do the math yourself. The formulas are there for those who want to investigate this further. There are probably many of you who will want to duplicate the formulas yourself. I invite you to do so. But for those of you who look at the following pages and say to yourself, "I don't have the time or the patience to do this math", realize that there are software solutions that make these calculations easy. In fact, one of our probability calculations in our own ODDS Online software is based entirely on the following formulas. The best part about ODDS Online is that it will actually find trades for you based on these probability parameters, and then automatically tell you the exact probabilities associated with the trades. So finding an option trade is easy, and the calculations are automatic. With that said, for those who want to refresh their math skills, let's move ahead.

We've just seen that the qualitative definition of volatility is the absolute risk potential and the absolute reward potential of an asset. The quantitative definition of volatility is: One standard deviation of the natural logarithm of the price change annualized. What a mouthful!

Let's take an example and see what that last paragraph means. Let's assume that a stock price is at 100 and it has a volatility of 10%. Leaving out the logarithm for a minute, this means that one year from now, one standard deviation above the stock price will be 110, which is 10% (our volatility number) above the current price of 100. It also means that one year from now, one standard deviation below the stock price will be 90, which is 10% below the current price.

Now I want you to think back to your high school days and think of what standard deviation actually means. While intimidating and tedious, it's not really that hard. The math involved is nothing more than addition, multiplication, division and calculating the square root. Here is the formula:

Formula 6 - Standard Deviation - Solves for the standard deviation of a sample set of numbers.

$$\sigma = \sqrt{\frac{\sum (x_i - \bar{x})^2}{N-1}}$$

Where,
$\bar{x}$ = mean
x_i = individual data values
N = number of observations

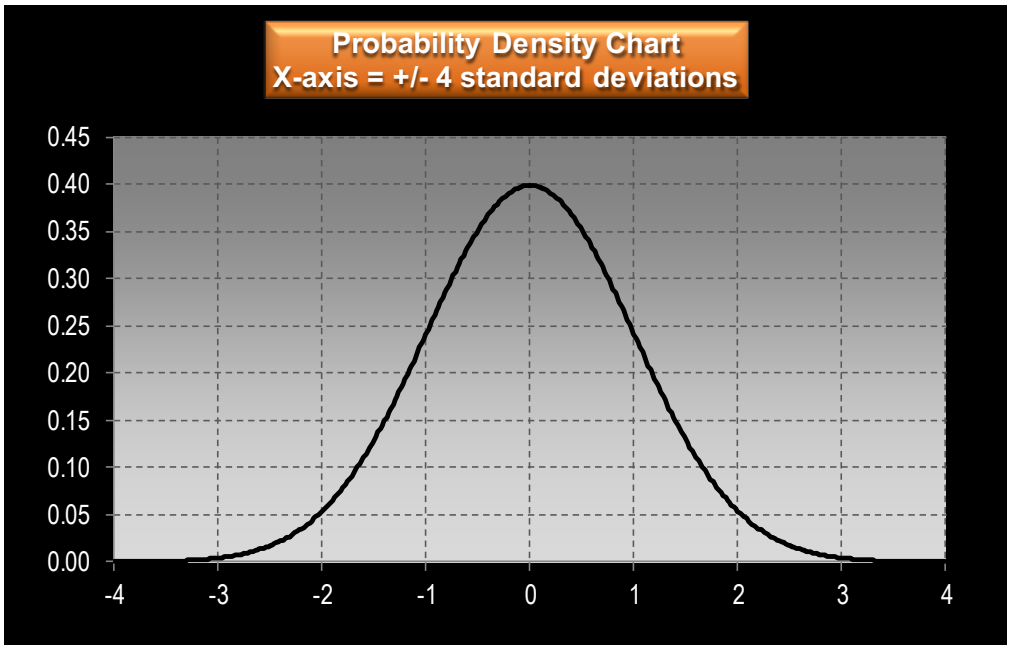
For instance, take a look at this set of numbers:

	x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
1	2	-2	4
2	4	0	0
3	5	1	1
4	3	-1	1
5	6	2	4
6	4	0	0
Mean: $\bar{x}$	4		$\sum (x_i - \bar{x})^2 = 10$
Number of observations: N	6		
$\frac{\sum (x_i - \bar{x})^2}{N-1}$	2.000		
$\sqrt{\frac{\sum (x_i - \bar{x})^2}{N-1}}$	1.414		

There are six numbers in the set (2,4,5,3,6,4). You add them up [24], divide by the number of numbers in the set [6], and get the average [4]. You then subtract that average from each number in the set, square the difference, and take the sum of the squares [10]. You then divide the sum of the squares by the number of numbers in the set minus 1 [10/(6-1)]. The result is 2. You then take the square root of 2, which is 1.414. That is your standard deviation.

Again, not hard, but very tedious. Can you imagine doing this with 100 numbers that are not so simple? That's why it is very helpful to calculate standard deviation using a computer. It's not that you can't do the math yourself. It's just that calculating standard deviation is tedious and repetitive—something perfectly suited for a computer.

Now that we know how to calculate standard deviation, what does it mean. For that, we're going to look at a couple of charts.



The chart above is a graph of the standard normal distribution. Better known as the bell curve. Notice the x-axis. It's defined in terms of standard deviation. And what's volatility? One standard deviation.

The reason this is important is that we can use this curve to calculate probability. My video, *Options Trading As A Business*, gets into the reasons that we can do this—the theories, the arbitrage limitations that force certain probability assumptions, etc.

We're not going to get into that in this e-book. Instead, we're going to focus on how to use this tool. Quite simply, you can use standard deviation to calculate probability. Probability is equal to the area under the bell curve.

For instance, the area to the left of –1 standard deviation is equal to about 16% of the entire area under the bell curve. The area to the right of +1 standard deviation is equal to about 16% of the entire area under the bell curve. The area in between + and – 1 standard deviation is about 68% of the entire area under the bell curve. This should be familiar to some of you who studied statistics.

Now think back to the definition of volatility and our earlier example of a stock at 100 with a volatility of 10%. In one year, one standard deviation up is 110 and one standard deviation down is 90. Based on the calculations above, there is a 16% chance that the stock will be above 110 one year from now. There is a 16% chance that the stock will be below 90 one year from now, and a 68% chance that the stock will be between 90 and 110 one year from now.

Putting It Together – Part I
Calculating An Option Trade's Probability
How Likely Is It To Wreck?

So let's summarize:

1. You can use a 4-way spread to make money as long as a stock stays within a range. You make money as long as it does not make a big move outside of the range.
2. You can use volatility to determine the likelihood that a stock will stay within an upper and lower boundary.
3. Putting these two factors together allows us to quantify the probability of success of a strategy that mimics the insurance business.

We're not done yet. That's because we need to cover one additional topic, and then we need to go one step further.

The topic left to discuss is the logarithm. The reason we need to use a logarithm is due to the way a stock price behaves. Let's say you have a stock at 10 and a volatility of 150%. One standard deviation up would be 25. One standard deviation down would be –5. Well that's a problem. A stock can't go to –5. It can only go to zero. The natural logarithm takes care of this by equating a 25% move up with a 20% move down. In other words, with a stock at 100, a move down to 80 is equivalent to a move up to 125.

The other issue we have to complete is based on this fact: volatility alone gives us the annualized standard deviation. It gives us the range over a one-year period. But in our earlier example, we looked at an option combination whose time frame was one month, not one year.

Fortunately, there are algebraic solutions. Now these are a little more difficult, and are covered extensively in our course on options and probability: *The Casino Secret to Profitable Options Trading*. More important, the results are easily obtained in several options analysis software programs.

Let's say that we have that same stock at 100 and we are looking at that same 4-way spread. Recall that the upper breakeven on the spread is 112.00 and the lower breakeven is 88.00. The spread is profitable as long as the stock is in between the two breakeven prices at expiration one month from now.

We can use volatility to determine the probability that such an event will occur. To do that, I need to first introduce you to a couple of new formulas. The first one turns our price targets into standard deviations:

$$x = \frac{\log\left(\frac{X}{S}\right)}{\sigma \times t}$$, where X = target price, S = current price, σ = volatility, t = time

In this case, time is equal to $\sqrt{\frac{days}{365}}$

It's important to note that the logarithm shown here is the natural logarithm. I've been in the financial business for more than three decades, and I still can't explain why financial software and financial textbooks use "log" to symbolize the natural logarithm, when every math book and

every other piece of software uses "ln" to symbolize the natural logarithm. That said, in order to be consistent with the financial textbooks, log symbolizes the natural logarithm.

The second formula turns standard deviation into probability. This one is pretty scary looking. The good news is that it is a function built into every major spreadsheet on the market. In Excel, it is simply "NORM.S.DIST".

$$N(x) = 1 - \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}} (b_1 t + b_2 t^2 + b_3 t^3 + b_4 t^4 + b_5 t^5), \text{ where } t = \frac{1}{1 + px} \text{ and}$$

$b_1 = 0.31938153$
$b_2 = -0.356563782$
$b_3 = 1.781477937$
$b_4 = -1.821255978$
$b_5 = 1.330274429$
$p = 3.141592654$

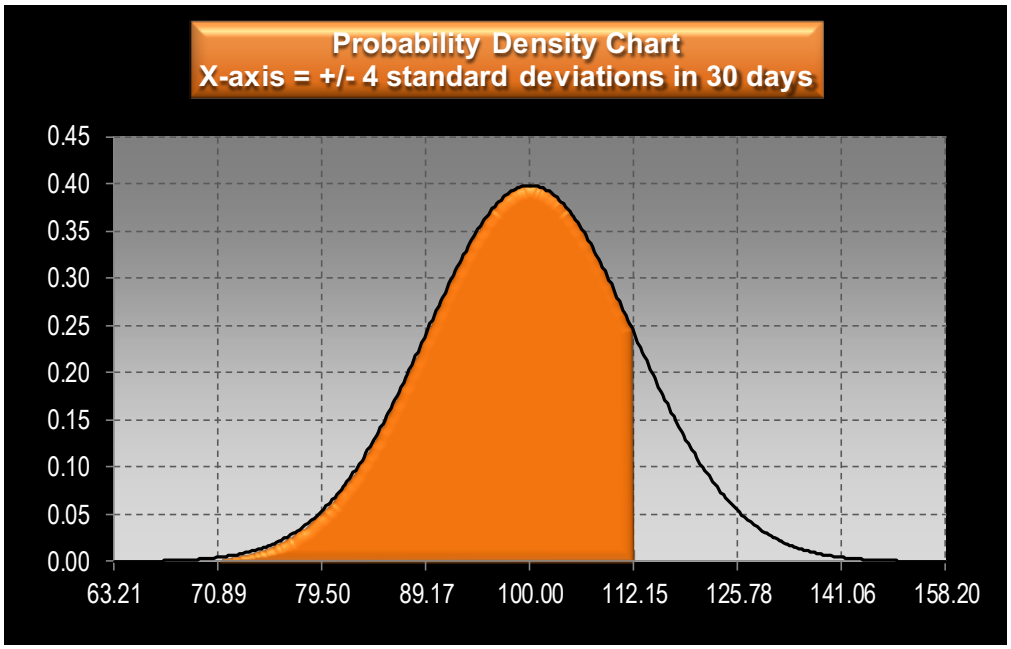
The solution *N(x)* represents the area under the bell curve to the left of the standard deviation.

Let's do one sample calculation—calculate the probability of exceeding the upper breakeven at expiration. For convenience, we are going to assume a round number volatility of 40%.

X	=	112
S	=	100
days	=	30
σ	=	40%
X/S	=	1.12
log(X/S)	=	0.1133
t	=	0.2867
$\sigma * t$	=	0.114676
x	=	0.9882

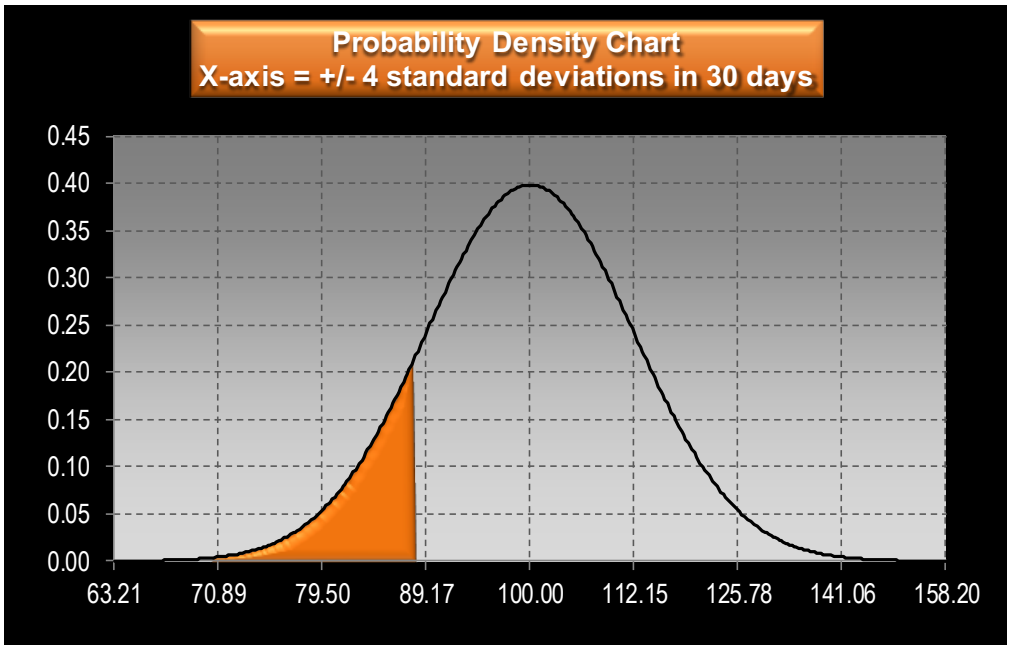
We then plug 0.9882 into *N(x)* to calculate *N(*0.9882*)*. We're not going to get into that in this e-book. But if you care to do this in Excel, it's =NORM.S.DIST(0.9882). The answer is: 83.85%.

Here is a graph of the calculation:

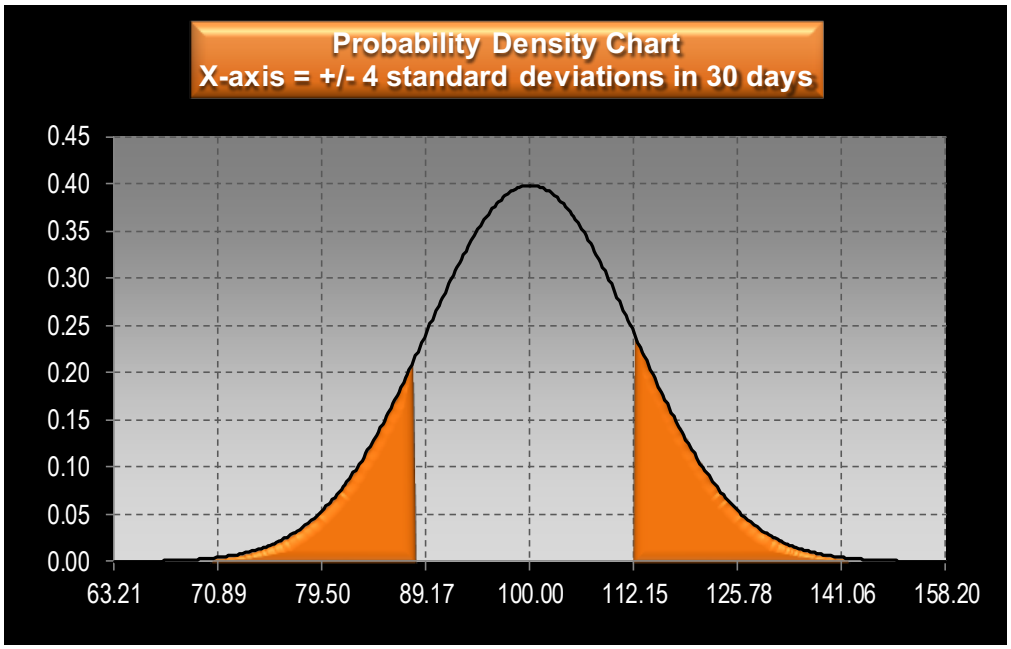


Notice that *N(x)* calculates the area to the left of *x*. We are interested in the area to the right of *x*, which is simply 100% minus 83.85% which equals 16.15%.

That's it. That is the probability that the stock will not be above the upper breakeven at expiration. You can perform the exact same calculation on the lower breakeven. When you do, you'll find that the probability is 13.25%.



That means the area in the middle is equal to 100% - 16.15% - 13.25% = 70.60%



We just performed a statistical analysis of the likelihood that a stock will move past the strike prices of our four-way spread and the net credit we received—past our breakeven point.

In the insurance world, that's like performing an analysis that a high school kid will have a wreck, and that the damage caused by the wreck will exceed the deductible and the premium we collected. What we are doing with options is remarkably similar to that which is done in a centuries-old business that happens to be very profitable!

Putting It Together – Part II
Reversing The Process
Finding An Option Trade That Wins As Often As You Choose

You now have most of the tools that you'll need to evaluate trades that you find on your own. You know what kind of option strategy to take in order to change the rules of investing. You know that once you find a stock, you can implement a four-way spread to make money as long as the stock does not make a big move. But which options are you supposed to trade? For instance, let's say that the stock is at 80. Should the options you sell as part of the spread be the 75 put and the 85 call? Or should you sell the 70 put and the 90 call?

What if I told you that volatility could provide you with the answer? The only thing you have to do is decide how frequently you want to win and then do a little math. As before, I am showing you the equations. Please don't get discouraged or confused. They are there for those who want to use them. For those of you who want to trade but don't want to use the formulas, realize that there is reasonably priced software available that can perform all the calculations shown.

The first step is to decide how frequently you want to win. Now when I ask that question in front of an audience, it usually brings one smart remark of 100%. Well, guess what? There are option trades that have a 100% chance of winning. The only thing is, the profit potential is not much more than a T-bill or a bank CD.

One other thing to realize is that this topic is also covered in great detail in our comprehensive course, *Profit Power*. In our *Profit Power* course, I not only discuss how to find the trade, but also how to make sure that when you implement the trade, you do so at a price that is appropriate. In other words, it's not enough to win 90% of the time. If you take ten trades and you lose only once, that's not good enough because the one loss could wipe out your nine wins. You have to make sure that your risk and reward are properly balanced so that not only do you win frequently, but when you win, your profits are big enough so that when you do get that infrequent loser, it's not a catastrophic loss. Like I said, if you want to get the details of each and every step, including the little nuances that every system has, be sure to check out *Profit Power*. It's that and a whole lot more.

With that said, let's move on to the process of finding a high-probability trade. Like I said, the first thing we need to do is determine how often we want to win. Next we need to find out what strike price coincides with that probability figure. Then, we construct an option trade that makes money as long as the stock or index does not move past that strike price.

The probability we select can be any number. For demonstration purposes only, I am going to choose 85%. That's not to say that 85% is the best number. It's just a random selection for demonstration purposes only.

As noted above, the next step is to find out what strike price coincides with that 85% number. That requires that we solve a couple of equations. The first equation converts 85% into a standard deviation. The second equation turns the standard deviation into a usable stock price. The equation that turns a 85% into a standard deviation is pretty hairy. In Excel, the function is "NORM.S.INV". Here is the actual equation:

$$x_p = t - \frac{c_0 + c_1 t + c_2 t^2}{1 + d_1 t + d_2 t^2 + d_3 t^3}, \text{ where } t = \sqrt{\ln \frac{1}{p^2}}$$

$$p = 1 - P, \text{ and } 0.5 \le P \le 1$$

$c_0 = 2.515517$
$c_1 = 0.802853$
$c_2 = 0.010328$
$d_1 = 1.432788$
$d_2 = 0.189269$
$d_3 = 0.001308$

Important Note: Because of the structure of the equation, the probability you choose must be greater than 50% and of course it must be less than 100%. That is not a problem for us. However, if you ever do want to solve the equation for a probability less than 50%, remember that the curve is symmetrical. You can solve for x when P is less than 50% by taking the probability and subtracting it from 1. For instance, if the probability is 25%, subtract that number from 100% to get 75%. Plug 75% into the equation to get the standard deviation. Then multiply the standard deviation by –1 to get the inverse.

If we plug 85% into the equation above, the solution is 1.0364.

Now that we've turned 85% into a standard deviation, we need to turn the standard deviation into a useable stock price. Let's use the same stock information as in the previous example: a stock price of 100, a volatility of 40%, and a time frame of one month.

This equation turns a standard deviation into a stock price:

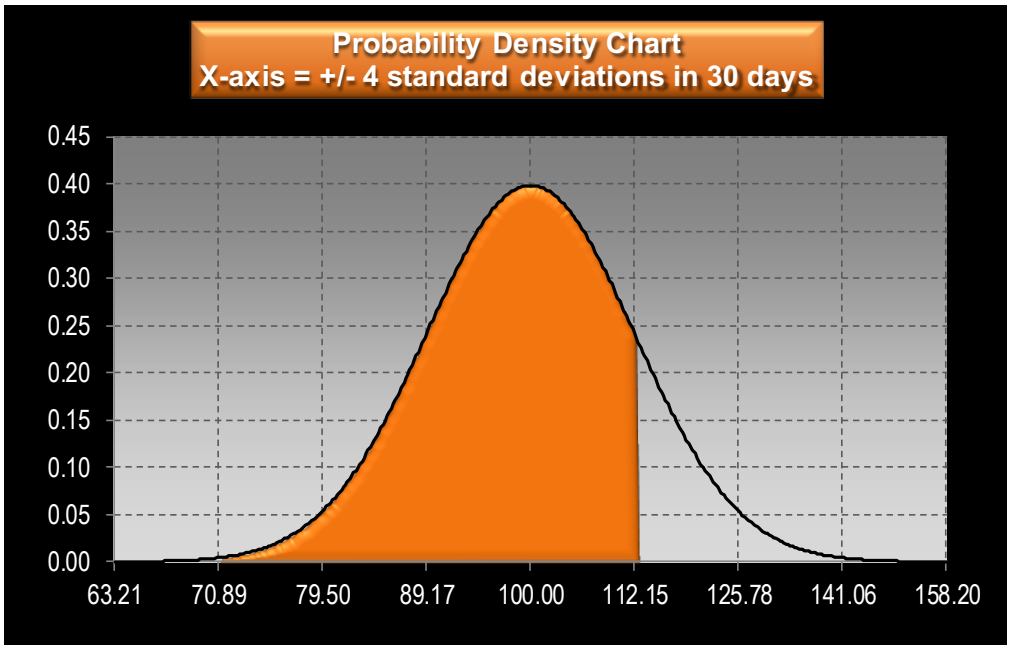
$X = e^{(\sigma \times t \times x)} \times S$, where x = standard deviation, S = current price, σ = volatility, t = time

As in the earlier equation, time is equal to $\sqrt{\frac{days}{365}}$

Here is the solution:

x	=	1.0364
S	=	100
$days$	=	30
σ	=	40%
t	=	0.2867
$\sigma * t * x$	=	0.1189
$e^{(\sigma * t * x)}$	=	1.1262
$e^{(\sigma * t * x)} * S$	=	112.62

Here is a graph of that calculation:



That solution is the stock price that corresponds to 85%. That means, if we sell an option one strike price further out-of-the-money, the probability that the stock will not move above the strike price is greater than 85%. In this particular case, the option one strike price further out of the money from 112.62 is 115. The 115 call will have more than an 85% chance of expiring worthless. And if it expires worthless, the option short sale will hit its maximum profit. It would be like writing an insurance policy knowing that there was better than an 85% chance of not having to pay a claim.

Now, the only thing left to do is buy the reinsurance. Recalling our discussion on this topic in an earlier section, you simply buy an option further out-of-the-money. In this particular instance, that would be the 120 strike price. And that is it; you have all the steps necessary to find the right option strategy.

Summary

We have taken a long journey together.

We began by looking at a business that has striking similarities to the options world, and that business is insurance.

We then looked at options from the very beginning to get every reader of this e-book familiar with the basics of options.

We then looked at ways to construct certain option strategies designed to mimic the writing of an insurance policy. We looked at the similarity between the deductible in an insurance policy with the strike price of an option. We looked at how volatility can be used to determine the likelihood of an option finishing in-the-money, just as demographics and loss data can be used to determine the likelihood of a driver having a wreck.

Finally, we looked at how to use the properties of volatility to find insurance-like option trades that are designed to win as often as you choose.

For those of you who are ready to take your options trading to the next level, we have an awesome suggestion. It's certainly not a requirement. But it sure will make your trading life easier. ODDS Online is a cloud-based options analysis software tool that actually goes into the options market and literally finds high accuracy trades in an instant. Not only that, it finds high profit straddles as well. So it's the perfect tool to implement the full range of *Options Trading As A Business* strategies.

But it doesn't stop there. ODDS Online performs all the necessary calculations, and it scans the market for incredible opportunities, and that's just scratching the surface.

ODDS Online is the software I designed specifically to make finding high quality trades fast and easy. If you have any questions, call 855-777-ODDS (6337).

I know you'll be glad you did.