AGRICULTURAL FUTURES & OPTIONS

A HEDGER'S SELF-STUDY GUIDE

Chicago Board of Trade

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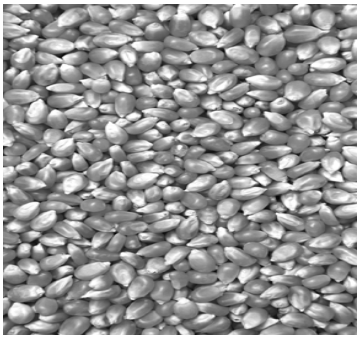
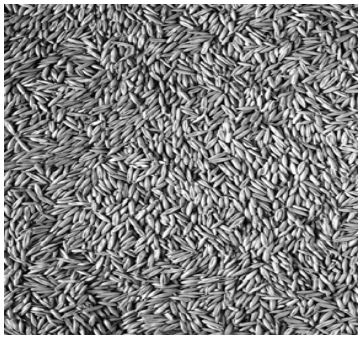




Introduction

The Options on Agricultural Futures Home Study Course has been a favorite among market participants since it was first published in 1984. Its release coincided with the launch of Chicago Board of Trade agricultural options, the first of which was soybean options in the fall of 1984.

Since then, options on all CBOT® agricultural futures contracts—corn, wheat, oats, rice, soybeans, soybean oil, and soybean meal—have been introduced. With these contracts we've seen phenomenal growth in trading volume. Such growth is tied to our customers, who like the flexibility of options and use them to meet a variety of marketing objectives.

If you're new to futures and options on futures, the first four chapters will give you a solid foundation. Chapters 5 and 6 include futures and options strategies, both from a buying and selling hedger's perspective. As a result of this revision, the book has been renamed Agricultural Futures and Options: A Hedger's Self-Study Guide. We hope you enjoy this text and that it answers many of your trading questions. In addition to reading on your own, your broker and the firm with which he or she is affiliated should be a primary source of information. The kind of help available ranges from access to research reports, analysis, and recommendations, to assistance in fine-tuning and executing your trading strategies. A principal objective of this guide is to better enable you to use such assistance profitably.

Chapter One

The Markets

Before you can begin to understand options on futures, you must know something about futures markets. This is because futures contracts are the underlying instruments on which the options are traded. And, as a result, option prices—referred to as premiums—are directly affected by futures prices.

In addition, the more you know about the markets, the better equipped you will be, based on current market conditions and your specific objectives, to decide whether to use futures contracts, options on futures contracts, or other marketing and pricing alternatives.

Historical Summary of the Chicago Board of Trade

From its inception in 1848, the Chicago Board of Trade has offered progressive solutions for managing risk. Founded by a group of merchants looking for innovative solutions to centralize grain trading, the exchange popularized "to-arrive" contracts. These early forward contracts allowed buyers and sellers of agricultural commodities to specify delivery of a particular commodity at a predetermined price and date.

By 1865, the Chicago Board of Trade took a step to formalize grain trading by developing standardized agreements called **futures contracts.** Futures contracts, in contrast to forward contracts, were standardized as to quality, quantity, and time and location of delivery of the commodity being traded. The only variable was price—discovered through an auction-like process on the trading floor of an organized exchange. Not too long later, the exchange's margining system was established to prevent customers from defaulting on contractual agreements.

Since those early years, the exchange has grown both in the variety and number of contracts traded. It offers a complete set of agricultural contracts—corn, wheat, oats, rice, soybean, soybean oil, and soybean meal futures as well as options on those contracts. Additionally, the Chicago Board of Trade entered into the financial trading arena during the mid-70s. Today, more than 80 percent of the Chicago Board of Trade trading volume comes from its financial futures and options contracts including the Treasury Complex, the Equities, and the Precious Metals.

The innovative spirit that was a cornerstone of its inception continues to drive the Chicago Board of Trade today. New contracts, expanding technology, new trading systems, and market innovation are always on the forefront as the Chicago Board of Trade works to meet the needs of a changing world economy.

The Futures Contract

A futures contract is a commitment to make or take delivery of a specific quantity and quality of a given commodity at a predetermined place and time in the future. All terms of the contract are standardized and established in advance except for the price, which is determined by open auction in a pit on the trading floor of a regulated commodity exchange or through an exchange's electronic trading system.

All contracts are ultimately settled either through liquidation by offsetting purchases or sales or by delivery of the actual physical commodity. An offsetting transaction is the more frequently used method to settle a futures contract; delivery usually occurs in less than 2 percent of all agricultural contracts traded.

Exchange Functions

The main economic functions of a futures exchange is **price risk management** and **price discovery**. The exchange accomplishes these functions by providing a facility and trading platforms that bring buyers and sellers together. The exchange also establishes and enforces rules to ensure that trading takes place in an open and competitive environment. For this reason, all bids and offers must be made through the exchange either in a designated trading pit by open auction or through the exchange's electronic order-entry trading system.

All trades must be made by a member of the exchange. If you are not a member, you work through a commodity broker. The broker calls in your order to an exchange member who executes the order. Once an order is filled, you are notified by your broker.

Can a futures price be considered a price prediction? In one sense, yes, because the futures price at any given time reflects the price expectations of both buyers and sellers at the time of delivery. This is how futures prices help to establish a balance between production and consumption. But in another sense, no, because a futures price is a price prediction subject to continuous change. Futures prices adjust to reflect additional information about supply and demand as it becomes available.

The CBOT itself does not in any way participate in the process of price discovery. It is neither a buyer nor a seller of futures contracts, so it doesn't have a role or interest in whether prices are high or low at any particular time. The role of the exchange is simply to provide a central marketplace. It is in this marketplace where supply and demand variables from around the world come together to discover price.

Market Participants

Futures market participants fall into two general categories: **hedgers** and **speculators**. Futures markets exist primarily for hedging, which is defined as the management of price risks inherent in the ownership and transaction of commodities.

The word **hedge** means protection. The dictionary states that to hedge is "to try to avoid or lessen a loss by making counterbalancing investments..." In the context of futures trading, that is precisely what a hedge is: a counter-balancing investment involving a position in the futures market that is opposite one's position in the cash market. Since the cash market price and futures market price of a commodity tend to move up and down together, any loss or gain in the cash market will be roughly offset or counterbalanced in the futures market. Hedgers include:

- **farmers, livestock producers**—who need protection against declining prices for crops or livestock, or against rising prices of purchased inputs such as feed;
- **merchandisers, elevators**—who need protection against lower prices between the time they purchase or contract to purchase grain from farmers and the time it is sold;
- **food processors, feed manufacturers**—who need protection against increasing raw material costs or against decreasing inventory values;
- **exporters**—who need protection against higher prices for grain contracted for future delivery but not yet purchased; and
- **importers**—who want to take advantage of lower prices for grain contracted for future delivery but not yet received.

Since the number of individuals and firms seeking protection against declining prices at any given time is rarely the same as the number seeking protection against rising prices, other market participants are needed. These participants are known as **speculators**.

Speculators facilitate hedging by providing liquidity—the ability to enter and exit the market quickly, easily and efficiently. They are attracted by the opportunity to realize a profit if they prove to be correct in anticipating the direction and timing of price changes.

These speculators may be part of the general public or they may be floor traders—members of the exchange operating in one of the trading pits. Floor traders are noted for their willingness to buy and sell on even the smallest of price changes. Because of this a seller can, at almost any time, find a buyer at or near the most recently quoted price. Similarly, buyers can find willing sellers without having to significantly bid up the price.

Financial Integrity of Markets

Margin, in the futures industry, is money that you as a buyer or seller of futures contracts must deposit with your broker and that brokers in turn must deposit with the Chicago Board of Trade Clearing Service Provider. These funds are used to ensure contract performance, much like a performance bond. This differs from the securities industry, where margin is simply a down payment required to purchase stocks and bonds.

The amount of margin a customer must maintain on deposit with his or her brokerage firm is set by the firm itself, subject to certain minimum levels established by the exchange where the contract is traded. If a change in the futures price results in a loss on an open futures position from one day to the next, funds will be withdrawn from the customer's margin account to cover the loss. If a customer must deposit additional money in the account to comply with the margin requirements it is known as **receiving a margin call**.

On the other hand, if a price change results in a gain on an open futures position, the amount of gain will be credited to the customer's margin account. A customer may make withdrawals from one's margin account at any time, provided the withdrawals do not reduce the account balance below the required minimum. Once an open position has been closed by an offsetting trade, any money in the margin account not needed to cover losses or provide margin for other open positions may be withdrawn by the customer.

The Chicago Board of Trade **Clearing Service Provider** performs the clearing operations for the CBOT. Just as every transaction on the trading floor must be executed by or through a CBOT member, every trade must be cleared by or through a clearing member firm.

In the clearing operation, the connection is severed between the original buyer and seller. In its place, the Clearing Service Provider assumes the opposite side of each open position and thereby ensures the financial integrity of every futures contract traded at the Chicago Board of Trade.

This assurance is accomplished through the mechanism of daily cash settlements. Each day, the Clearing Service Provider determines the gain or loss on each trade. It then calculates total gains or losses on all trades cleared by each clearing member firm. If a firm has incurred a net loss for the day, its account is debited and the firm may be required to deposit additional margin with the Clearing Service Provider. Conversely, if the firm has a net gain for the day, the firm receives a credit to its account. The firm then credits or debits each individual customer account.

Since 1925, no customer has ever incurred a loss due to default of a clearing member firm.

QUIZ

Quiz 1

Multiple Choice:
Select the best answer to each of the following questions.

1. **Futures contracts are:**
   (a) the same as forward contracts
   (b) standardized contracts to make or take delivery of a commodity at a predetermined place and time
   (c) contracts with standardized price terms
   (d) all of the above

2. **Futures prices are discovered by:**
   (a) bids and offers
   (b) officers and directors of the exchange
   (c) written and sealed bids
   (d) the Board of Trade Clearing Service Provider
   (e) both (b) and (d)

3. **The primary function of the Clearing Service Provider is to:**
   (a) prevent speculation in futures contracts
   (b) ensure the integrity of the contracts traded
   (c) clear every trade made at the CBOT
   (d) supervise trading on the exchange floor
   (e) both (b) and (c)

4. **Gains and losses on futures positions are settled:**
   (a) by signing promissory notes
   (b) each day after the close of trading
   (c) within five business days
   (d) directly between the buyer and seller
   (e) none of the above

5. **Speculators help to:**
   (a) increase the number of potential buyers and sellers in the market
   (b) add to market liquidity
   (c) aid in the process of price discovery
   (d) facilitate hedging
   (e) all of the above

6. **Hedging involves:**
   (a) taking a futures position opposite to one's current cash market position
   (b) taking a futures position identical to one's current cash market position
   (c) holding only a futures market position
   (d) holding only a cash market position
   (e) none of the above

7. **Margins in futures trading:**
   (a) serve the same purpose as margins for common stock
   (b) limit the use of credit in buying commodities
   (c) serve as a down payment
   (d) serve as a performance bond
   (e) are required only for long positions

8. **You may receive a margin call if:**
   (a) You have a long (buy) futures position and prices increase
   (b) You have a long (buy) futures position and prices decrease
   (c) You have a short (sell) futures position and prices increase
   (d) You have a short (sell) futures position and prices decrease
   (e) both (a) and (d)
   (f) both (b) and (c)

9. **Margin requirements for customers are established by:**
   (a) the Federal Reserve Board
   (b) the Commodity Futures Trading Commission
   (c) the brokerage firms, subject to exchange minimums
   (d) the Clearing Service Provider
   (e) private agreement between buyer and seller

10. **Futures trading gains credited to a customer's margin account can be withdrawn by the customer:**
    (a) as soon as the funds are credited
    (b) only after the futures position is liquidated
    (c) only after the account is closed
    (d) at the end of the month
    (e) at the end of the year

See the answer guide at the back of this book.

Chapter Two

Hedging with Futures and Basis

Hedging is based on the principle that cash market prices and futures market prices tend to move up and down together. This movement is not necessarily identical, but it usually is close enough that it is possible to lessen the risk of a loss in the cash market by taking an opposite position in the futures market. Taking opposite positions allows losses in one market to be offset by gains in the other. In this manner, the hedger is able to establish a price level for a cash market transaction that may not actually take place for several months.

The Short Hedge

To give you a better idea of how hedging works, let's suppose it is May and you are a soybean farmer with a crop in the field; or perhaps an elevator operator with soybeans you have purchased but not yet sold. In market terminology, you have a long cash market position. The current cash market price for soybeans to be delivered in October is $6.00 per bushel. If the price goes up between now and October, when you plan to sell, you will gain. On the other hand, if the price goes down during that time, you will have a loss.

To protect yourself against a possible price decline during the coming months, you can hedge by selling a corresponding number of bushels in the futures market now and buying them back later when it is time to sell your crops in the cash market. If the cash price declines by harvest, any loss incurred will be offset by a gain from the hedge in the futures market. This particular type of hedge is known as a **short hedge** because of the initial short futures position.

With futures, a person can sell first and buy later or buy first and sell later. Regardless of the order in which the transactions occur, buying at a lower price and selling at a higher price will result in a gain on the futures position.

Selling now with the intention of buying back at a later date gives you a short futures market position. A price decrease will result in a futures gain, because you will have sold at a higher price and bought at a lower price.

For example, let's assume cash and futures prices are identical at $6.00 per bushel. What happens if prices decline by $1.00 per bushel? Although the value of your long cash market position decreases by $1.00 per bushel, the value of your short futures market position increases by $1.00 per bushel. Because the gain on your futures position is equal to the loss on the cash position, your net selling price is still $6.00 per bushel.

	Cash market	Futures market
May	cash soybeans are $6.00/bu	sell Nov soybean futures at $6.00/bu
Oct	sell cash soybeans at $5.00/bu	buy Nov soybean futures at $5.00/bu
change	$1.00/bu loss	$1.00/bu gain

sell cash soybeans at	$5.00/bu
gain on futures position	+$1.00/bu*
net selling price	$6.00/bu

Note: When hedging, you use the futures contract month closest to the time, but not after, you plan to purchase or sell the physical commodity.
*Does not include transaction fees.

What if soybean prices had instead risen by $1.00 per bushel? Once again, the net selling price would have been $6.00 per bushel, as a $1.00 per bushel loss on the short futures position would be offset by a $1.00 per bushel gain on the long cash position.

Notice in both cases the gains and losses on the two market positions cancel out each other. That is, when there is a gain on one market position, there is a comparable loss on the other. This explains why hedging is often said to "lock in" a price level.

	Cash market	Futures market
May	cash soybeans are $6.00/bu	sell Nov soybean futures at $6.00/bu
Oct	sell cash soybeans at $7.00/bu	buy Nov soybean futures at $7.00/bu
change	$1.00/bu gain	$1.00/bu loss
sell cash soybeans at		$7.00/bu
loss on futures position		-$1.00/bu
net selling price		$6.00/bu

In both instances, the hedge accomplished what it set out to achieve: It established a selling price of $6.00 per bushel for soybeans to be delivered in October. With a short hedge, you give up the opportunity to benefit from a price increase to obtain protection against a price decrease.

The Long Hedge

On the other hand, livestock feeders, grain importers, food processors, and other buyers of agricultural products often need protection against rising prices and would instead use a **long hedge** involving an initial long futures position.

For example, assume it is July and you are planning to buy corn in November. The cash market price in July for corn delivered in November is $2.50 per bushel, but you are concerned that by the time you make the purchase, the price may be much higher. To protect yourself against a possible price increase, you buy December corn futures at $2.50 per bushel. What would be the outcome if corn prices increase 50 cents per bushel by November?

	Cash market	Futures market
Jul	cash corn is $2.50/bu	buy Dec corn futures at $2.50/bu
Nov	buy cash corn at $3.00/bu	sell Dec corn futures at $3.00/bu
change	$.50/bu loss	$.50/bu gain
buy cash corn at		$3.00/bu
gain on futures position		-$.50/bu
net purchase price		$2.50/bu

In this example, the higher cost of corn in the cash market was offset by a gain in the futures market.

Conversely, if corn prices decreased by 50 cents per bushel by November, the lower cost of corn in the cash market would be offset by a loss in the futures market. The net purchase price would still be $2.50 per bushel.

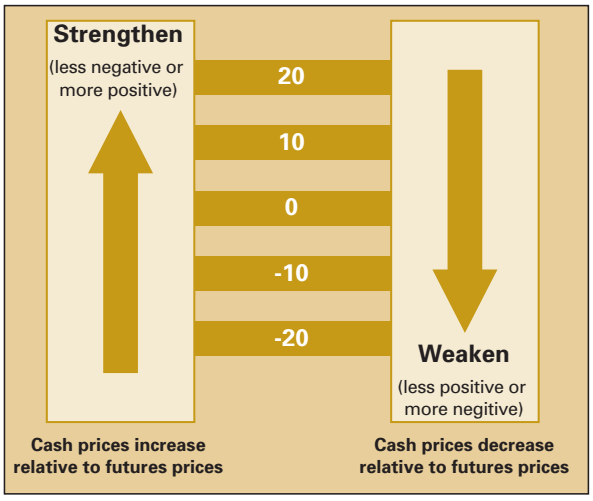
	Cash market	Futures market
Jul	cash corn is $2.50/bu	buy Dec corn futures at $2.50/bu
Nov	buy cash corn at $2.00/bu	sell Dec corn futures at $2.00/bu
change	$.50/bu gain	$.50/bu loss
buy cash corn at		$2.00/bu
loss on futures position		+$.50/bu
net purchase price		$2.50/bu

Remember, whether you have a short hedge or a long hedge, any losses on your futures position may result in a margin call from your broker, requiring you to deposit additional funds to your margin account. As previously discussed, adequate funds must be maintained in the account to cover day-to-day losses. However, keep in mind that if you are incurring losses on your futures market position, then it is likely that you are incurring gains on your cash market position.

Basis: The Link Between Cash and Futures Prices

All of the examples just presented assumed identical cash and futures prices. But, if you are in a business that involves buying or selling grain or oilseeds, you know the cash price in your area or what your supplier quotes for a given commodity usually differs from the price quoted in the futures market. Basically, the local cash price for a commodity is the futures price adjusted for such variables as freight, handling, storage and quality, as well as the local supply and demand factors. The price difference between the cash and futures prices may be slight or it may be substantial, and the two prices may not always vary by the same amount.

This price difference (cash price - futures price) is known as the **basis.**



A primary consideration in evaluating the basis is its potential to strengthen or weaken. The more positive (or less negative) the basis becomes, the stronger it is. In contrast, the more negative (or less positive) the basis becomes, the weaker it is.

For example, a basis change from 10 cents under (a cash price $.10 less than the futures price) to a basis of 5 cents under (a cash price $.05 less than the futures price) indicates a strengthening basis, even though the basis is still negative. On the other hand, a basis change from 20 cents over (a cash price $.20 more than the futures price) to a basis of 15 cents over (a cash price $.15 more than the futures price) indicates a weakening basis, despite the fact that the basis is still positive. (**Note:** Within the grain industry a basis of 15 cents over or 15 cents under a given futures contract is usually referred to as "15 over" or "15 under." The word "cents" is dropped.) Basis is simply quoting the relationship of the local cash price to the futures price.

Basis and the Short Hedger

Basis is important to the hedger because it can affect the final outcome of a hedge. For example, suppose it is March and you plan to sell wheat to your local elevator in mid-June. The July wheat futures price is $3.50 per bushel, and the cash price in your area in mid-June is normally about 35 under the July futures price.

	Cash market	Futures market	Basis
Mar	expected cash wheat price is $3.15/bu	sell Jul wheat futures at $3.50/bu	-.35
Jun	sell cash wheat at $2.65/bu	buy Jul wheat futures at $3.00/bu	-.35
change	$.50/bu loss	$.50/bu gain	0

sell cash wheat at	$2.65/bu
gain on futures position	+$.50/bu
net selling price	$3.15/bu

The approximate price you can establish by hedging is $3.15 per bushel ($3.50 - $.35) provided the basis is 35 under. The previous table shows the results if the futures price declines to $3.00 by June and the basis is 35 under.

Suppose, instead, the basis in mid-June had turned out to be 40 under rather than the expected 35 under. Then the net selling price would be $3.10, rather than $3.15.

	Cash market	Futures market	Basis
Mar	expected cash wheat price is $3.15/bu	sell Jul wheat futures at $3.50/bu	-.35
Jun	sell cash wheat at $2.60/bu	buy Jul wheat futures at $3.00/bu	-.40
change	$.55/bu loss	$.50/bu gain	.05 loss
sell cash wheat at			$2.60/bu
gain on futures position			+$.50/bu
net selling price			$3.10/bu

This example illustrates how a weaker-than-expected basis reduces your net selling price. And, as you might expect, your net selling price increases with a stronger-than-expected basis. Look at the following example.

As explained earlier, a short hedger benefits from a strengthening basis. This information is important to consider when hedging. That is, as a short hedger, if you like the current futures price and expect the basis to strengthen, you should consider hedging a portion of your crop or inventory as shown in the next table. On the other hand, if you expect the basis to weaken and would benefit from today's prices, you might consider selling your commodity now.

	Cash market	Futures market	Basis
Mar	expected cash wheat price is $3.15/bu	sell Jul wheat futures at $3.50/bu	-.35
Jun	sell cash wheat at $2.75/bu	buy Jul wheat futures at $3.00/bu	-.25
change	$.40/bu loss	$.50/bu gain	.10 gain
sell cash wheat at			$2.75/bu
gain on futures position			+$.50/bu
net selling price			$3.25/bu

Basis and the Long Hedger

How does basis affect the performance of a long hedge? Let's look first at a livestock feeder who in October is planning to buy soybean meal in April. May soybean meal futures are $170 per ton and his local basis in April is typically $20 over the May futures price, for an expected purchase price of $190 per ton ($170 + $20). If the futures price increases to $200 by April and the basis is $20 over, the net purchase price remains at $190 per ton.

	Cash market	Futures market	Basis
Oct	expected cash soybean meal price is $190/ton	buy May soybean meal futures at $170/ton	+$20
Apr	buy cash soybean meal at $220/ton	sell May soybean meal futures at $200/ton	+$20
change	$30/ton loss	$30/ton gain	0
buy cash soybean meal at			$220/ton
gain on futures position			-$30/ton
net purchase price			$190/ton

What if the basis strengthens—in this case, more positive—and instead of the expected $20 per ton over, it is actually $40 per ton over in April? Then the net purchase price increases by $20 to $210.

	Cash market	Futures market	Basis
Oct	expected cash soybean meal price is $190/ton	buy May soybean meal futures at $170/ton	+$20
Apr	buy cash soybean meal at $240/ton	sell May soybean meal futures at $200/ton	+$40
change	$50/ton loss	$30/ton gain	$20 loss

buy cash soybean meal at	$240/ton
gain on futures position	-$30/ton
net purchase price	$210/ton

Conversely, if the basis weakens moving from $20 over to $10 over, the net purchase price drops to $180 per ton ($210 - $30).

Notice how long hedgers benefit from a weakening basis—just the opposite of a short hedger. What is important to consider when hedging is basis history and market expectations. As a long hedger, if you like the current futures price and expect the basis to weaken, you should consider hedging a portion of your commodity purchase. On the other hand, if you expect the basis to strengthen and like today's prices, you might consider buying your commodity now.

	Cash market	Futures market	Basis
Oct	expected cash soybean meal price is $190/ton	buy May soybean meal futures at $170/ton	+$20
Apr	buy cash soybean meal at $210/ton	sell May soybean meal futures at $200/ton	+$10
change	$20/ton loss	$30/ton gain	$10 gain

buy cash soybean meal at	$210/ton
gain on futures position	-$30/ton
net purchase price	$180/ton

Hedging with futures offers you the opportunity to establish an approximate price months in advance of the actual sale or purchase and protects the hedger from unfavorable price changes. This is possible because cash and futures prices tend to move in the same direction and by similar amounts, so losses in one market can be offset with gains in the other. Although the futures hedger is unable to benefit from favorable price changes, you are protected from unfavorable market moves.

Basis risk is considerably less than price risk, but basis behavior can have a significant impact on the performance of a hedge. A stronger-than-expected basis will benefit a short hedger, while a weaker-than-expected basis works to the advantage of a long hedger.

Basis Change	Stronger	Weaker
Short Hedge	Favorable	Unfavorable
Long Hedge	Unfavorable	Favorable

Importance of Historical Basis

By hedging with futures, buyers and sellers are eliminating futures price level risk and assuming basis level risk. Although it is true that basis risk is relatively less than the risk associated with either cash market prices or futures market prices, it is still a market risk. Buyers and sellers of commodities can do something to manage their basis risk. Since agricultural basis tends to follow historical and seasonal patterns, it makes sense to keep good historical basis records.

The table below is a sample of a basis record. Although there are numerous formats available, the content should include: date, cash market price, futures market price (specify contract month), basis and market factors for that date. This information can be put into a chart format as well.

Basis Table Notes:

1) The most common type of basis record will track the current cash market price to the nearby futures contract month price. It is a good practice to switch the nearby contract month to the next futures contract month prior to entering the delivery month. For example, beginning with the second from last business day in November, switch tracking from December corn futures to the March corn futures (the next contract month in the corn futures cycle).

2) It is common to track basis either daily or weekly. If you choose to keep track of basis on a weekly schedule, be consistent with the day of the week you follow. Also, you may want to avoid tracking prices and basis only on Mondays or Fridays.

3) Basis tables will help you compare the current basis with the expected basis at the time of your purchases or sales. In other words, it will help determine if a supplier's current offer or an elevator's current bid is stronger or weaker than expected at the time of the purchase or sale.

4) Putting basis information from multiple years on a chart will highlight the seasonal and historical patterns. It will also show the historical basis range (strongest and weakest levels) for any given time period.

Date	Cash price	Futures price/month	Basis	Market factors
10/02/03	$2.60	$2.77 Dec.	-$.17 (Z)	Extended local dry spell in forecast.
10/03/03	$2.70	$2.95 Dec.	-$.25 (Z)	Report of stronger than expected exports.

**Z is the ticker symbol for December Futures*

Quiz 2

QUIZ

Multiple Choice:
Select the best answer to each of the following questions.

1. **The premise that makes hedging possible is cash and futures prices:**
   (a) move in opposite directions
   (b) move upward and downward by identical amounts
   (c) generally change in the same direction by similar amounts
   (d) are regulated by the exchange

2. **To hedge against an increase in prices, you would:**
   (a) purchase futures contracts
   (b) sell futures contracts

3. **A farmer's crop is still in the field. His cash market position is:**
   (a) long
   (b) short
   (c) neither, since the crop hasn't been harvested
   (d) neutral, because he has no position in the futures market

4. **The term basis is:**
   (a) the difference between cash market prices in different locations
   (b) the difference between prices for different delivery months
   (c) the difference between the local cash price and a futures price
   (d) relevant only to speculation

5. **If you estimate the basis will be 15 over December futures at the time you purchase corn, the approximate buying price you can lock in by selling a December futures contract at $2.50 is:**
   (a) $2.65
   (b) $2.60
   (c) $2.35
   (d) none of the above

6. **If you estimate the local cash price will be 15 under the March futures price at the time you deliver your corn, the approximate net selling price you can lock in by selling a March futures contract at $2.50 is:**
   (a) $2.65
   (b) $2.60
   (c) $2.35
   (d) none of the above

7. **Assuming your local cash price is generally quoted under the CBOT futures price, an increase in transportation costs in your area would be expected to have what effect on the basis:**
   (a) weaken the basis
   (b) strengthen the basis
   (c) no effect on the basis

8. **If you have a long cash market position and do not hedge it, you are:**
   (a) a speculator
   (b) in a position to profit from an increase in price
   (c) subject to a loss if prices decline
   (d) all of the above

9. **Assume your supplier's cash market price is generally quoted over the CBOT futures price. If you hedge by purchasing a futures contract, a good time to purchase product and lift the hedge would be:**
   (a) once you have hedged, it makes no difference
   (b) when the basis is relatively weak
   (c) when the basis is relatively strong
   (d) whenever the cash market price is highest

10. **Basis risk involves:**
    (a) the fact that basis cannot be predicted exactly
    (b) the absolute level of futures prices
    (c) the inherent volatility of futures prices

continued on next page

Quiz 2 *(continued)*

11. Suppose you're a snack food manufacturer wanting to establish a purchase price for soybean oil you will need by late February. Currently, March soybean oil futures are trading at 25 cents per pound and the local basis for February delivery is 5 cents over March soybean oil futures. From your basis records, the basis is typically 2 cents over March soybean oil futures for February delivery. Under this situation, it would make "sense" to:

(a) hedge yourself in the futures market to take advantage of today's prices and wait until the basis weakens to purchase soybean oil in the cash market

(b) purchase the soybean oil in the cash market and not hedge yourself

(c) do nothing

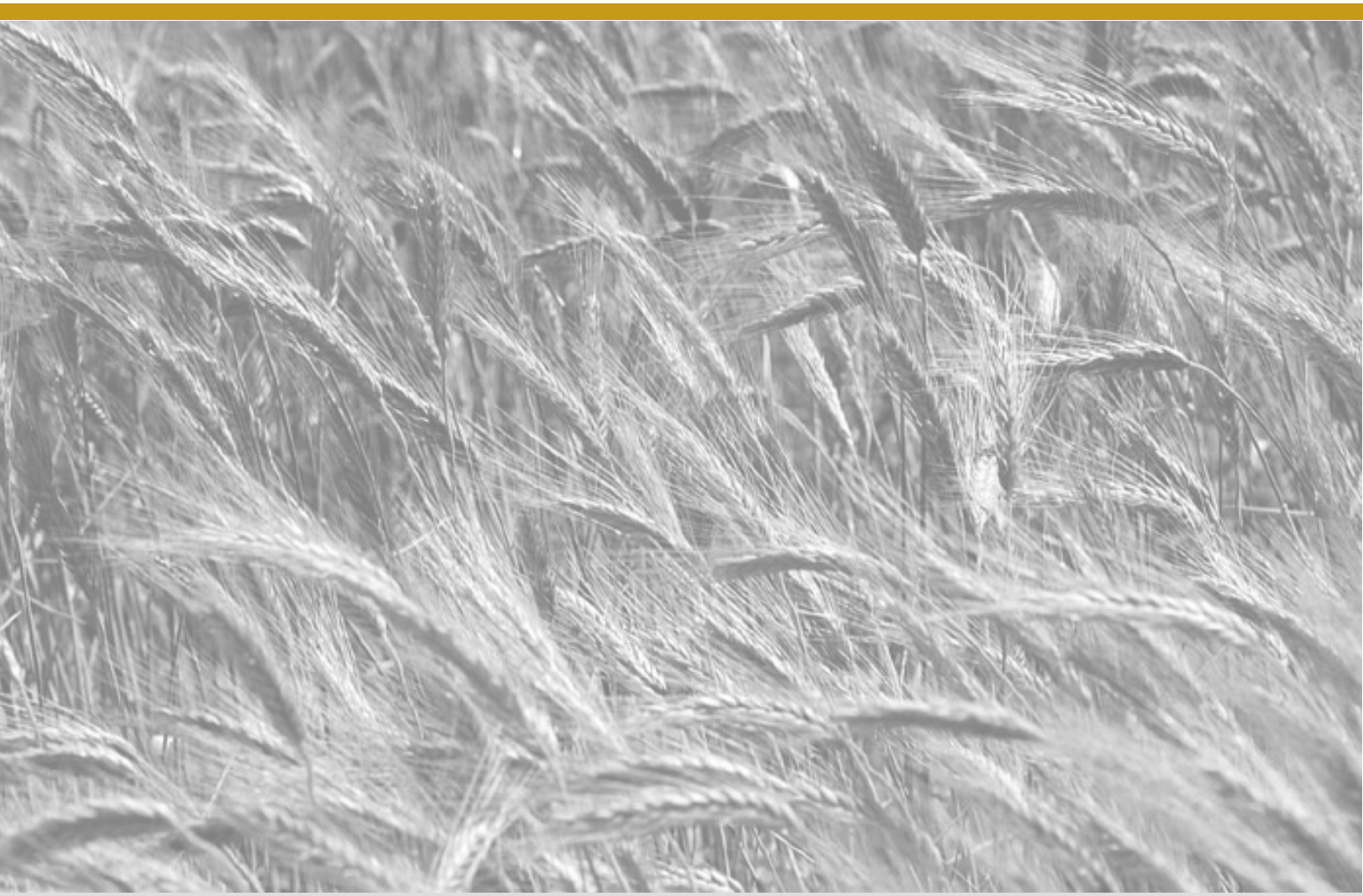
12. Assume you're a flour miller and decide to hedge your upcoming wheat purchase. At the time, CBOT December wheat futures are trading at $3.50 a bushel and the expected local basis for delivery mid-November is 12 cents over December futures. If you hedge your position, what is your expected purchase price if the basis is 12 cents over?

(a) $3.50

(b) $3.62

(c) $3.40

See the answer guide at the back of this book.



Chapter Three

Futures Hedging Strategies for Buying and Selling Commodities

Now that you have a basic understanding of how futures contracts are used to manage price risks and how basis affects your buying and selling decisions, it is time to try your hand at a few strategies. Upon completing this chapter, you should be able to:

- **recognize those situations when you will benefit most from hedging**
- **calculate the dollars and cents outcome of a given strategy, depending on market conditions**
- **understand the risks involved with your marketing decisions**

The strategies covered in this chapter include:

- **buying futures for protection against rising commodity prices**
- **selling futures for protection against falling commodity prices**

To review some of the points from the preceding chapter, hedging is used to manage your price risks. If you are a buyer of commodities and want to hedge your position, you would initially buy futures contracts for protection against rising prices. At a date closer to the time you plan to actually purchase the physical commodity, you would offset your futures position by selling back the futures contracts you initially bought. This type of hedge is referred to as a **long hedge.** Long hedgers benefit from a weakening basis.

On the other hand, if you sell commodities and need protection against falling prices, you would initially sell futures contracts. At a date closer to the time you price the physical commodity, you would buy back the futures contracts you initially sold. This is referred to as a **short hedge.** Short hedgers benefit from a strengthening basis.

The following strategies are examples of how those in agribusiness use futures contracts to manage price risks. Also, note how basis information is used in making hedging decisions and how changes in the basis affect the final outcome.

Buying Futures for Protection Against Rising Prices

Assume you are a feed manufacturer and purchase corn on a regular basis. It is December and you are in the process of planning your corn purchases for the month of April—wanting to take delivery of the corn during mid-April. Several suppliers in the area are offering long-term purchase agreements, with the best quote among them of 5 cents over May futures. CBOT May futures are currently trading at $2.75 per bushel, equating to a cash forward offer of $2.80 per bushel.

If you take the long-term purchase agreement, you will lock in the futures price of $2.75 per

bushel and a basis of 5 cents over, or a flat price of $2.80 per bushel. Or, you could establish a futures hedge, locking in a futures price of $2.75 per bushel but leaving the basis open.

In reviewing your records and historical prices, you discover the spot price of corn in your area during mid-April averages 5 cents under the May futures price. And, based on current market conditions and what you anticipate happening between now and April, you believe the mid-April basis will be close to 5 cents under.

Action
Since you like the current futures price but anticipate the basis weakening, you decide to hedge your purchase using futures rather than entering into a long-term purchase agreement. You purchase the number of corn contracts equal to the amount of corn you want to hedge. For example, if you want to hedge 15,000 bushels of corn, you buy (go "long") 3 corn futures contracts because each contract equals 5,000 bushels.

By purchasing May corn futures, you lock in a purchase price of $2.80 if the basis remains unchanged (futures price of $2.75 + the basis of $.05 over). And, if the basis weakens, you will benefit from any basis appreciation. Of course, you realize the basis could surprise you and strengthen, but, based on your records and market expectations, you feel it is in your best interest to hedge your purchases.

Prices Increase Scenario
If the price increases and the basis remains unchanged at 5 cents over, you will purchase corn at $2.80 per bushel (futures price of $2.75 + the basis of $.05 over). But if the price increases and the basis weakens, the purchase price is reduced.

Assume by mid-April, when you need to purchase the physical corn, the May futures price has increased to $3.25 and the best offer for physical corn in your area is $3.20 per bushel (futures price - the basis of $.05 under).

	Cash market	Futures market	Basis
Dec	long-term offer at $2.80/bu	buy May corn futures at $2.75/bu	+.05
Apr	buy cash corn at $3.20/bu	sell May corn futures at $3.25/bu	-.05
change	$.40/bu loss	$.50/bu gain	.10 gain

buy cash corn at	$3.20/bu
gain on futures position	-$.50/bu
net purchase price	$2.70/bu

With the futures price at $3.25, the May corn futures contract is sold back for a net gain of 50 cents per bushel ($3.25 - $2.75). That amount is deducted from the current local cash price of corn, $3.20 per bushel, which equals a net purchase price of $2.70. Notice the price is 10 cents lower than what you would have paid for corn through a long-term purchase agreement. The lower price is a result of a weakening of the basis, moving from 5 cents over to 5 cents under May futures.

Prices Decrease Scenario
If prices decrease and the basis remains unchanged, you will still pay $2.80 per bushel for corn. Hedging with futures provides protection against rising prices, but it does not allow you to take advantage of lower prices. In making the decision to hedge, one is willing to give up the chance to take advantage of lower prices in return for price protection. On the other hand, the purchase price will be lower if the basis weakens.

Assume by mid-April the May futures price is $2.45 per bushel and the best quote offered by an area supplier is also $2.45 per bushel. You

purchase corn from the supplier and simultaneously offset your futures position by selling back the futures contracts you initially bought.

Even though you were able to purchase cash corn at a lower price, you lost 30 cents on your futures position. This equates to a net purchase price for corn of $2.75. The purchase price is still 5 cents lower than what you would have paid for corn through a long-term purchase agreement. Again, this difference reflects a weakening of the basis from 5 cents over to even (no basis).

In hindsight, you would have been better off neither taking the long-term purchase agreement nor hedging because prices fell. But your job is to purchase corn, add value to it, and sell the final product at a profit. If you don't do anything to manage price risk, the result could be disastrous to your firm's bottom line. Back in December, you evaluated the price of corn, basis records, and your firm's expected profits based upon that information. You determined by hedging and locking in the price for corn your firm could earn a profit. You also believed the basis would weaken, so you hedged to try and take advantage of a weakening basis. Therefore, you accomplished what you intended. The price of corn could just as easily have increased.

	Cash market	Futures market	Basis
Dec	long-term offer at $2.80/bu	buy May corn futures at $2.75/bu	+.05
Apr	buy cash corn at $2.45/bu	sell May corn futures at $2.45/bu	.00
change	$0.35/bu gain	$0.30/bu loss	.05 gain
buy cash corn at			$2.45/bu
loss on futures position			+$.30/bu
net purchase price			$2.75/bu

Prices Increase/Basis Strengthens Scenario
If the price rises and the basis strengthens, you will be protected from the price increase by hedging but the strengthening basis will increase the final net purchase price relative to the long-term purchase agreement.

Assume in mid-April your supplier is offering corn at $3.10 per bushel and the May futures contract is trading at $3.03 per bushel. You purchase the physical corn and offset your futures position by selling back your futures contracts at $3.03. This provides you with a futures gain of 28 cents per bushel, which lowers the net purchase price. However, the gain does not make up entirely for the higher price of corn. The 2-cent difference between the long-term purchase agreement and the net purchase price reflects the strengthening basis.

	Cash market	Futures market	Basis
Dec	long-term offer at $2.80/bu	buy May corn futures at $2.75/bu	+.05
Apr	buy cash corn at $3.10/bu	sell May corn futures at $3.03/bu	+.07
change	$0.30/bu loss	$0.28/bu gain	.02 loss
buy cash corn at			$3.10/bu
gain on futures position			-$.28/bu
net purchase price			$2.82/bu

As we've seen in the preceding examples, the final outcome of a futures hedge depends on what happens to basis between the time a hedge is initiated and offset. In those scenarios, you benefitted from a weakening basis.

In regard to other marketing alternatives, you may be asking yourself how does futures hedging compare? Suppose you had entered a long-term purchase agreement instead of hedging? Or maybe you did nothing at all—what happens then?

If May futures price in April is:	April basis	Alternative 1 Do nothing (spot cash price)	Alternative 2 Hedge with futures at $2.75	Alternative 3 Long-term purchase agreement at $2.80
$2.65	+.05	$2.70	$2.80	$2.80
$2.75	+.05	$2.80	$2.80	$2.80
$2.85	+.05	$2.90	$2.80	$2.80
$2.65	-.05	$2.60	$2.70	$2.80
$2.75	-.05	$2.70	$2.70	$2.80
$2.85	-.05	$2.80	$2.70	$2.80
$2.65	+.10	$2.75	$2.85	$2.80
$2.75	+.10	$2.85	$2.85	$2.80
$2.85	+.10	$2.95	$2.85	$2.80

The table above compares your alternatives illustrating the potential net purchase price under several possible futures prices and basis scenarios.

You can not predict the future but you can manage it. By evaluating your market expectations for the months ahead and reviewing past records, you will be in a better position to take action and not let a buying opportunity pass you by. *Alternative 1* shows what your purchase price would be if you did nothing at all. While you would benefit from a price decrease you are at risk if prices increase and unable to manage your bottom line.

Alternative 2 shows what your purchase price would be if you established a long hedge in December, offsetting the futures position when you purchase physical corn in April. As you can see, a changing basis affects the net purchase price but not as much as a significant price change.

Alternative 3 shows what your purchase price would be if you entered a long-term purchase agreement in December. Basically, nothing affected your final purchase price but you could not take advantage of a weakening basis or lower prices.

Quiz 3

QUIZ

1. **Suppose, as in the previous scenario, you purchase a May corn futures contract at $2.75 per bushel and the basis is 5 cents under when you actually buy corn from your supplier in April.**

   What would be the net purchase price in April if the May corn futures price is:

May futures price	*Net purchase price*
$2.58	$_____per bu
$2.84	$_____per bu
$2.92	$_____per bu

2. **What would your net purchase price be if May corn futures is $2.80 and the basis is 7 cents over when you offset your futures position in April?**

See the answer guide at the back of this book.

Selling Futures for Protection Against Falling Prices

Assume you are a corn producer. It is May 15 and you just finished planting your crop. The weather has been unseasonably dry, driving prices up significantly. However, you feel the weather pattern is temporary and are concerned corn prices will decline before harvest.

Currently, December corn futures are trading at $2.70 per bushel and the best bid on a forward contract is $2.45 per bushel, or 25 cents under the December futures contract. Your estimated cost of production is $2.10 per bushel. Therefore, you could lock in a profit of 35 cents per bushel through this forward contract. Before entering into the contract, you review historical prices and basis records and discover the local basis during mid-November is usually about 15 cents under December futures.

Action

Because the basis in the forward contract is historically weak, you decide to hedge using futures. You sell the number of corn contracts equal to the amount of corn you want to hedge. For example, if you want to hedge 20,000 bushels of corn, you sell (go "short") 4 corn futures contracts because each futures contract equals 5,000 bushels.

By selling December corn futures, you lock in a selling price of $2.45 if the basis remains unchanged (futures price of $2.70 - the basis of $.25). And, if the basis strengthens, you will benefit from any basis appreciation. But remember, there is a chance the basis could actually weaken. So, although you maintain the basis risk, basis is generally much more stable and predictable than either the cash market or futures market prices.

Prices Decrease Scenario

If the price declines and the basis remains unchanged, you are protected from the price decline and will receive $2.45 per bushel for your crop (futures price of $2.70 - the basis of $.25). If the price drops and the basis strengthens, you will receive a higher than expected price for your corn.

By November, the best spot bid in your area for corn is $2.05 per bushel. Fortunately, you were hedged in the futures market and the current December futures price is $2.20. When you offset the futures position by buying back the same type and amount of futures contracts as you initially sold, you realize a gain of 50 cents per bushel ($2.70 - $2.20). Your gain in the futures market increases your net sales price.

As you can see from the table below, the net sales price is actually 10 cents greater than the forward contract bid quoted in May. This price difference reflects the change in basis, which strengthened by 10 cents between May and November.

	Cash market	Futures market	Basis
May	cash forward (Nov) bid at $2.45/bu	sell Dec corn futures at $2.70/bu	-.25
Nov	sell cash corn at $2.05/bu	buy Dec corn futures at $2.20/bu	-.15
change	$.40/bu loss	$.50/bu gain	.10 gain

sell cash corn at	$2.05/bu
gain on futures position	+$.50/bu
net sales price	$2.55/bu

Prices Increase Scenario

If the price increases and the basis remains unchanged, you will still receive $2.45 per bushel for your crop. That is the futures price ($2.70) less the basis ($.25 under). With futures hedging, you lock in a selling price and cannot take advantage of a price increase. The only variable that

ultimately affects your selling price is basis. As shown in the following example, you will receive a higher than expected price for your corn if the basis strengthens.

Suppose by mid-November the futures price increased to $2.90 per bushel and the local price for corn is $2.70 per bushel. Under this scenario, you will receive $2.50 per bushel—5 cents more than the May forward contract bid. In reviewing the table below, you will see the relatively higher price reflects a strengthening basis and is not the result of a price level increase. Once you establish a hedge, the futures price level is locked in. The only variable is basis.

	Cash market	Futures market	Basis
May	cash forward (Nov) bid at $2.45/bu	sell Dec corn futures at $2.70/bu	-.25
Nov	sell cash corn at $2.70/bu	buy Dec corn futures at $2.90/bu	-.20
change	$.25/bu gain	$.20/bu loss	.05 gain
sell cash corn at			$2.70/bu
loss on futures position			-$.20/bu
net sales price			$2.50/bu

If you could have predicted the future in May, more than likely you would have waited and sold your corn in November for $2.70 per bushel rather than hedging. But predicting the future is beyond your control. In May, you liked the price level and knew the basis was historically weak. Knowing your production cost was $2.10 per bushel, a selling price of $2.45 provided you a respectable profit margin.

In both of these examples, the basis strengthened between the time the hedge was initiated and offset, which worked to your advantage. But how would your net selling price be affected if the basis weakened?

Prices Decrease/Basis Weakens Scenario
If the price falls and the basis weakens, you will be protected from the price decrease by hedging but the weakening basis will slightly decrease the final net sales price.

Assume by mid-November, the December futures price is $2.37 and the local basis is 27 cents under. After offsetting your futures position and simultaneously selling your corn, the net sales price equals $2.43 per bushel. You will notice the net sales price is 2 cents lower than the forward contract bid in May, reflecting the weaker basis.

	Cash market	Futures market	Basis
May	cash forward (Nov) bid at $2.45/bu	sell Dec corn futures at $2.70/bu	-.25
Nov	sell cash corn at $2.10/bu	buy Dec corn futures at $2.37/bu	-.27
change	$.35/bu loss	$.33/bu gain	.02 loss
sell cash corn at			$2.10/bu
gain on futures position			+$.33/bu
net sales price			$2.43/bu

As we've seen in the preceding examples, the final outcome of a futures hedge depends on what happens to the basis between the time a hedge is initiated and offset. In these scenarios, you benefitted from a strengthening basis.

In regard to other marketing alternatives, you may be asking yourself how does futures hedging compare? Suppose you had entered a forward contract instead of hedging? Or maybe you did nothing—what happens then?

The following table compares your alternatives and illustrates the potential net return under several different price levels and changes to the basis.

You can calculate your net sales price under different futures prices and changes to the basis. Of course, hindsight is always 20/20 but historical records will help you take action and not let a selling opportunity pass you up.

Alternative 1 shows what your net sales price would be if you did nothing at all. While you would benefit from a price increase, you are at risk if the price of corn decreases and at the mercy of the market.

Alternative 2 shows what your net return would be if you established a short hedge in May, offsetting the futures position when you sell your corn in November. As you can see, a changing basis affects the sales price but not as much as a significant price change.

Alternative 3 shows what your net return would be if you cash forward contracted in May. Basically, nothing affected your final sales price, but you could not take advantage of a strengthening basis or higher prices.

If Dec futures price in Nov is:	Mid-Nov basis	***Alternative 1*** Do nothing (spot cash price)	***Alternative 2*** Hedge with futures at $2.70	***Alternative 3*** Cash forward contract at $2.45
$2.60	-.25	$2.35	$2.45	$2.45
$2.70	-.25	$2.45	$2.45	$2.45
$2.80	-.25	$2.55	$2.45	$2.45
$2.60	-.15	$2.45	$2.55	$2.45
$2.70	-.15	$2.55	$2.55	$2.45
$2.80	-.15	$2.65	$2.55	$2.45
$2.60	-.35	$2.25	$2.35	$2.45
$2.70	-.35	$2.35	$2.35	$2.45
$2.80	-.35	$2.45	$2.35	$2.45

QUIZ

Quiz 4

1. Let's assume you're a soybean producer. In July, you decide to hedge the sale of a portion of your expected bean crop for delivery in the fall. Currently, November futures are trading at $6.55 per bushel, and the quoted basis for harvest delivery today is 25 cents under November soybean futures. According to your historical basis records, the local basis for harvest is normally 20 cents under the November soybean futures contract. Fill out the blanks below:

Cash forward market	Futures market	Basis
Jul		
_____	_____	_____

What price will you receive for your harvest sale if the actual basis is as you expected?

Sold Nov Futures price	Expected basis	Expected selling price
_____	_____	_____

2. By October, the local elevator price for soybeans has declined to $5.90 per bushel. You sell your soybeans for that cash price, and you buy a futures contract at $6.10 per bushel to off set your hedge. Bring down the information from the previous table and complete the remainder of the table below.

Cash forward market	Futures market	Basis
Jul		
_____	_____	_____
Oct		
_____	_____	_____
Result:	_____ **gain/loss**	_____ **change**
cash sale price	_____	
gain/loss on futures position	_____	
net sales price	_____	

See the answer guide at the back of this book.

Chapter Four

The Basics of Ag Options

Hedging with futures is a valuable risk management tool if used at the right time. Hedging allows you to lock in a certain price level and protects you against adverse price moves. In other words, you are committed to a specific buying or selling price and are willing to give up any additional market benefit if prices move in your favor because you want price protection.

Remember, hedging involves holding opposite positions in the cash and futures markets. So, as the value of one position rises, the value of the other position falls. If the value of the hedger's cash market position increases, the value of the hedger's futures market position decreases and the hedger may receive a margin call.

When buying an option, a hedger is protected against an unfavorable price change but, at the same time, can take advantage of a favorable price change. In addition, buying an option does not require margin, so there isn't any risk of receiving a margin call.

These features allow sellers of ag commodities to establish floor (minimum) selling prices for protection against falling markets without giving up the opportunity to profit from rising markets. Likewise, options allow buyers of ag products to set ceiling (maximum) buying prices and protect themselves from price increases. At the same time, they retain the ability to take advantage of any price decreases. The cost of these benefits is the option premium. The option buyer pays the premium.

Rather than buying an option to protect yourself from an unfavorable price change, sometimes you may find it attractive to sell an option. Although selling an option provides only limited protection against unfavorable market moves and requires you to post margin, it provides additional income if prices remain stable or move in a favorable direction. The option seller collects the premium.

What Is an Option?

An option is simply the right, but not the obligation, to buy or sell something at a specific predetermined price (strike price) at any time within a specified time period. A commodity option, also known as an option on a futures contract, contains the right to buy or sell a specific futures contract.

There are two distinct types of options: Call options and Put options. Call options contain the right to buy the underlying futures contract and put options contain the right to sell the underlying futures contract. Note: Call and put options are not the opposite of each other, nor are they offsetting positions.

Call and put options are completely separate and different contracts. Every call option has a buyer and seller and every put option has a buyer and seller. Buyers of calls or puts are buying (holding) the rights contained in the specific option. Sellers of calls or put options are selling (granting) the rights contained in the specific option.

Option buyers pay a price for the rights contained in the option. The option price is known as premium*. An option buyer has limited loss potential (premium paid) and unlimited gain potential. The premium is paid initially when the option is bought. Since the option buyer has rights, but not obligations, the option buyer does not have margin requirements. Option buyers can exercise (use) their rights at any time prior to the option expiration.

** More details on premium will be covered later in this chapter.*

Option sellers collect the premium for their obligations to fulfill the rights. An option seller has limited gain potential (premium received) and unlimited loss potential, due to the obligations of the position. Since the option seller has obligations to the marketplace, option sellers have margin requirements to ensure contract performance.

Option sellers are obligated to fulfill the rights contained in an option if and when the option buyer chooses to exercise the rights. Since there can be many option buyers and sellers of identical options, there is a random selection of the option sellers to determine which option seller will be exercised on.

Although option sellers cannot initiate the exercise process, they can offset their short option position by buying an identical option at any time through the close of the last trading day.

Exercise Position Table

	Call option	Put option
Option buyer	Pays premium; right to buy	Pays premium; right to sell
Option seller	Collects premium; obligation to sell	Collects premium; obligation to buy

Underlying Commodity
Traditional commodity options are called **standard options**. Standard options have the same contract month name as the underlying futures contract. Exercising a standard option will result in a futures position in the same contract month as the option at the specified strike price.

Exercising a $6.00 November soybean call option will result in the: call option buyer receiving a long (buy) position in November soybean futures at $6.00; call option seller receiving a short (sell) position in November soybean futures at $6.00.

Serial Options
In addition to the standard options, there are **serial options**. Serial options are short-term options that are traded in months that are not in the traditional trading cycle of the underlying commodity. Exercising a serial option will result in a futures position in the next month in the futures cycle. Serial options can be used for short-term price protection.

Exercising a $2.50 June corn put option will result in the: put option buyer receiving a short (sell) position in July corn futures at $2.50; put option seller being assigned to a long (buy) position in July corn futures at $2.50.

When Do Option Rights Expire?
The last trading day and the expiration of standard and serial options occurs in the month prior to their contract month name (e.g., March oat options expire in February and October wheat serial options expire in September).

The last trading day is the last day that an option can be bought or sold. The last trading day of an option is the Friday preceding the first position day of the contract month. Therefore, a general rule of thumb is the option's last trading day will usually be the third or fourth Friday in the month prior to the option contract month. **Option expiration** occurs on the day after the last trading day (i.e., a Saturday).

How Are Options Traded?

CBOT options contracts are traded in much the same manner as their underlying futures contracts. All buying and selling occurs by competitive bids and offers made in the trading pit on the floor of the CBOT, through the exchange's electronic order-entry system, or through the CBOT's electronic trading platform. There are several important facts to remember when trading options:

Corn, Wheat, Oats	
Standard months	**Serial months**
March	January
May	February
July	April
September	June
December	August
	October
	November

Rice	
Standard months	**Serial months**
January	February
March	April
May	June
July	August
September	October
November	December

Soybeans	
Standard months	**Serial months**
January	February
March	April
May	June
July	October
August	December
September	
November	

Soybean Oil & Meal	
Standard months	**Serial months**
January	February
March	April
May	June
July	November
August	
September	
October	
December	

- At any given time, there is simultaneous trading in a number of different call and put options—different in terms of commodities, contract months and strike prices.

- Strike prices are listed in predetermined intervals (multiples) for each commodity: As an example, corn options are initially listed in 10-cent intervals (i.e., $2.00, $2.10, $2.20, etc.). Since strike price intervals may change in response to market conditions, Chicago Board of Trade Rules and Regulations should be checked for current contract information.

- When an option is first listed, strike prices include an at- or near-the-money option, five strikes above and five strikes below. This applies to both puts and calls. As market conditions change additional strike prices are listed, offering you a variety of strikes to choose from.

- An important difference between futures and options is trading in futures contracts is based on prices, while trading in options is based on premiums. To illustrate, someone wanting to buy a December corn futures contract might bid $2.50 per bushel. But a person wanting to buy an option on December corn futures might bid 25 cents for a $2.60 call option or 40 cents for a $2.40 call option. These bids—25 cents and 40 cents—are the premiums that a call option buyer pays a call option seller for the right to buy a December corn futures contract at $2.60 and $2.40, respectively.

- The premium is the only element of the option contract negotiated through the trading process; all other contract terms are standardized.

- For an option buyer, the premium represents the maximum cost or amount that can be lost, since the option buyer is limited only to the initial investment. In contrast, the premium represents the maximum gain for an option seller.

Option Pricing

At this point in your study of options, you may be asking yourself some very important questions: How are option premiums arrived at on a day-to-day basis? Will you have to pay 10 cents for a particular option? Or will it cost 30 cents? And if you bought an option and want to sell it prior to expiration, how much will you be able to get for it?

The short answer to these questions is that premium is determined by basic supply and demand fundamentals. In an open-auction market, buyers want to pay the lowest possible price for an option and sellers want to earn the highest possible premium. There are some basic variables that ultimately affect the price of an option as they relate to supply and demand, and they will be covered in the next section.

Intrinsic Value

It can be said that option premiums consist of two components:

1. Intrinsic value
2. Time value

An option's premium at any given time is the total of its intrinsic value and its time value. The total premium is the only number you will see or hear quoted. However, it is important to understand the factors that affect time value and intrinsic value, as well as their relative impact on the total premium.

Intrinsic value + Time value = Premium

Intrinsic Value—This is the amount of money that could be currently realized by exercising an option with a given strike price. An option's intrinsic value is determined by the relationship of the option strike price to the underlying futures price. An option has intrinsic value if it is currently profitable to exercise the option.

A call option has intrinsic value if its strike price is below the futures price. For example, if a soybean call option has a strike price of $6.00 and the underlying futures price is $6.50, the call option will have an intrinsic value of 50 cents.

A put option has intrinsic value if its strike price is above the futures price. For example, if a corn put option has a strike price of $2.60 and the underlying futures price is $2.30, the put option will have an intrinsic value of 30 cents.

Determining Intrinsic Value

Calls: Strike price < Underlying futures price
Puts: Strike price > Underlying futures price

Option Classification

At any point in the life of an option, puts and calls are classified based on their intrinsic value. The same option can be classified differently throughout the life of the option.

In-the-Money—In trading jargon, an option, whether a call or a put, that has intrinsic value (i.e., currently worthwhile to exercise) is said to be in-the-money by the amount of its intrinsic value. At expiration, the value of a given option will be whatever amount, if any, that the option is in-the-money. A call option is in-the-money when the strike price is below the underlying futures price. A put option is in-the-money when the strike price is greater than the underlying futures price.

Out-of-the-Money—A call option is said to be out-of-the-money if the option strike price is currently above the underlying futures price. A put option is out-of-the-money if the strike price is below the underlying futures price. Out-of-the-money options do not have any intrinsic value.

At-the-Money—If a call or put option strike price and the underlying futures price are the same, or approximately the same, the option is at-the-money. At-the-money options do not have any intrinsic value.

Determining Option Classifications

In-the-money
Call option: Futures price > Strike price
Put option: Futures price < Strike price

Out-of-the-money
Call option: Futures price < Strike price
Put option: Futures price > Strike price

At-the-money
Call option: Futures price = Strike price
Put option: Futures price = Strike price

To repeat, an option's value at expiration will be equal to its intrinsic value—the amount by which it is in-the-money. This is true for both puts and calls.

Calculating an Option's Intrinsic Value
Mathematically speaking, it is relatively easy to calculate an option's intrinsic value at any point in the life of an option. The math function is basic subtraction. The two factors involved in the calculation are the option's strike price and the current underlying futures price.

For call options, intrinsic value is calculated by subtracting the call strike price from the underlying futures price.

- If the difference is a positive number (i.e., the call strike price is less than the underlying futures price), there is intrinsic value.
  - Example: 22 December soybean oil call when December soybean oil futures is trading at 23 cents. (23 cents – 22 cent strike price = 1 cent of intrinsic value)

- If the difference is 0 (i.e., call strike price is equal to the underlying futures price), then that call option doesn't have any intrinsic value.
  - Example: 22 December soybean oil call when December soybean oil futures is trading at 22 cents. (22 cents – 22 cent strike price = 0 intrinsic value)

- If the difference is a negative number (i.e., call strike price is greater than the underlying futures price), then the call option currently doesn't have any intrinsic value.
  - Example: 22 December soybean oil call when December soybean oil futures is trading at 20 cents. (20 cents – 22 cent strike price = 0 intrinsic value)

Note. Intrinsic value can only be a positive number (i.e., an option can't have negative intrinsic value).Therefore, you can say the call option in this example is out-of-the-money by 2 cents but you shouldn't say that it has a negative 2 cents intrinsic value.

For put options, intrinsic value is calculated by subtracting the underlying futures price from the put strike price.

- If the difference is a positive number (i.e., the put strike price is greater than the underlying futures price), there is intrinsic value.
  - Example: $3.50 March wheat put when March wheat futures is trading at $3.20. ($3.50 strike price – $3.20) = 30 cents of intrinsic value)

- If the difference is 0 (i.e., put strike price is equal to the underlying futures price), then that put option doesn't have any intrinsic value.
  - Example: $3.50 March wheat put when March wheat futures is trading at $3.50. ($3.50 strike price - $3.50 = 0 intrinsic value)

- If the difference is a negative number (i.e., put strike price is less than the underlying futures price), then the put option currently doesn't have any intrinsic value.
  - Example: $3.50 March wheat put when March wheat futures is trading at $3.75. ($3.50 strike price - $3.75 = 0 intrinsic value)

Note. Intrinsic value can only be a positive number (i.e., an option can't have negative intrinsic value). Therefore, you can say the put option in this example is out-of-the-money by

25 cents but you shouldn't say that it has a negative 25 cents intrinsic value.

At the expiration of a call or put option, the option's premium consists entirely of intrinsic value—the amount that it is in-the-money.

Time Value

If an option doesn't have intrinsic value (either it's at-the-money or out-of-the-money), that option's premium would be all **time value**.

Time value is the difference between the total premium and the intrinsic value.

Total premium
- Intrinsic value
Time value

Although the mathematics of calculating time value is relatively easy when you know the total premium and the intrinsic value, it is not quite as easy to understand the factors that affect time value.

Quiz 5

QUIZ

Here's a quick quiz to check your understanding of what the intrinsic value will be for a given option. If you have fewer than six correct answers, it would be a good idea to review the preceding discussion.

1. **A November soybean call has a strike price of $6.50. The underlying November futures price is $7.00. The intrinsic value is _____.**

2. **A July corn call has a strike price of $2.50. The underlying July futures price is $2.50. The intrinsic value is _____.**

3. **A September wheat call has a strike price of $3.00. The underlying September futures price is $3.50. The intrinsic value is _____.**

4. **A March soybean call has a strike price of $6.50. The underlying March futures price is $5.89. The intrinsic value is _____.**

5. **An August soybean meal put has a strike price of $230. The underlying August futures price is $250. The intrinsic value is _____.**

6. **A December wheat put has a strike price of $3.60. The underlying December futures price is $3.20. The intrinsic value is _____.**

7. **A May corn put has a strike price of $2.80. The underlying May futures price is $2.55. The intrinsic value is _____.**

8. **A September soybean put has a strike price of $6.20. The underlying September futures price is $6.77. The intrinsic value is _____.**

See the answer guide at the back of this book.

Now on to the other component of option premium—time value. Simply stated, time value is equal to the total premium less the intrinsic value. **Time value**—sometimes called **extrinsic value**—reflects the amount of money buyers are willing to pay in expectation that an option will be worth exercising at or before expiration.

One of the components of time value reflects the amount of time remaining until the option expires. For example, let's say that on a particular day in mid-May the November soybean futures price is quoted at $6.30. Calls with a strike price of $6.50 on November soybean futures are trading at a price of 12 cents per bushel. The option is out of the money and therefore, has no intrinsic value. Even so, the call option has a time value of 12 cents (i.e., the option's premium—its extrinsic value) and a buyer may be willing to pay 12 cents for the option.

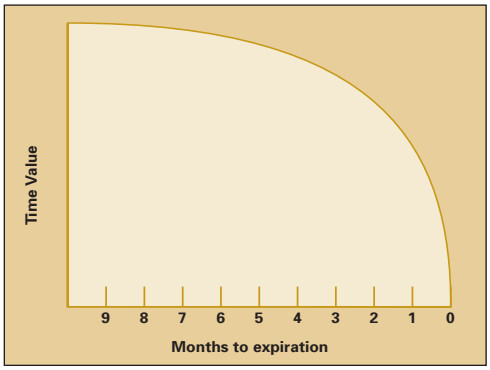
Why? Because the option still has five months to go before it expires in October, and, during that time, you hope that the underlying futures price will rise above the $6.50 strike price. If it were to climb above $6.62 (strike price of $6.50 + $.12 premium), the holder of the option would realize a profit.

At this point in the discussion, it should be apparent why at expiration an option's premium will consist only of intrinsic value. Such an option would no longer have time value—for the simple reason that there is no longer time remaining.

Let's go back to the out-of-the-money call, which, five months prior to expiration, commanded a premium of 12 cents per bushel. The next question is why 12 cents? Why not 10 cents? Or 30 cents? In other words, what are the factors that influence an option's time value? While interest rates and the relationship between the underlying futures price and the option strike price affect time value, the two primary factors affecting time value are:

1. **The length of time remaining until expiration.**

2. **The volatility of the underlying futures price.**



Length of Time Remaining Until Expiration
All else remaining equal, the more time an option has until expiration, the higher its premium. Time value is usually expressed in the number of days until expiration. This is because it has more time to increase in value (to employ an analogy, it's safer to say it will rain within the next five days than to say it will rain within the next two days). Again, assuming all else remains the same, an option's time value will decline (erode) as the option approaches expiration. This is why options are sometimes described as "decaying assets." As the above chart shows, an option at expiration will have zero time value (its only value, if any, will be its intrinsic value).

Also note that the rate of decay increases as you approach expiration. In other words, as the option approaches expiration, the option buyer loses a larger amount of time value each day. Therefore, hedgers, who buy options, may want to consider offsetting their long option position prior to the heavy time value decay and replace it with another risk management position in the cash, futures or option market.

Volatility of the Underlying Futures Price
All else remaining the same, option premiums are generally higher during periods when the underlying futures prices are volatile. There is more price risk involved with market volatility and therefore a greater need for price protection. The cost of the price insurance associated with options is greater, and thus the premiums will be higher. Given that an option may increase in value when futures prices are more volatile, buyers will be willing to pay more for the option. And, because an option is more likely to become worthwhile to exercise when prices are volatile, sellers require higher premiums.

Thus, an option with 90 days to expiration might command a higher premium in a volatile market than an option with 120 days to expiration in a stable market.

Other Factors Affecting Time Value
Option premiums also are influenced by the relationship between the underlying futures price and the option strike price. All else being equal (such as volatility and length of time to expiration), an at-the-money option will have more time value than an out-of-the-money option. For example, assume the soybean oil futures price is 24 cents per pound. A call with a 24-cent strike price (an at-the-money call) will command a higher premium than an otherwise identical call with a 26-cent strike price. Buyers, for instance, might be willing to pay 2 cents for the at-the-money call, but only 1.5 cents for the out-of-the-money call. The reason is that the at-the-money call stands a much better chance of eventually moving in the money.

An at-the-money option is also likely to have more time value than an option that is substantially in the money (referred to as a deep in-the-money option). One of the attractions of trading options is “leverage”—the ability to control relatively large resources with a relatively small investment. An option will not trade for less than its intrinsic value, so when an option is in-the-money, buyers generally will have to pay over and above its intrinsic value for the option rights. A deep in-the-money option requires a greater investment and compromises the leverage associated with the option. Therefore, the time value of the option erodes.

Generally, for a given time to expiration, the greater an option’s intrinsic value, the less time value it is likely to have. At some point, a deep in-the-money option may have no time value—even though there is still time remaining until expiration.

Another factor influencing time value is interest rates. Although the effect is minimal, it is important to realize that as interest rates increase, time value decreases. The opposite is also true—as interest rates decrease, time value increases.

Quiz 6

QUIZ

Here's a quick quiz to check your understanding of time value. If you have fewer than six right, it would be a good idea to review the previous discussion on time value.

1. A $2.70 December corn call is selling for a premium of 35 cents. At the time, December corn futures are trading at $3.00.
The time value is_____.

2. A $6.80 November soybean put is selling for a premium of 3 cents. November soybean futures are trading at $6.77.
The time value is_____.

3. A wheat call has a strike price of $3.70. At expiration, the underlying futures price is $3.80.
The time value is_____.

4. July corn futures are trading at $3.00. A $2.50 July corn call is trading at a premium of 60 cents.
The time value is_____.

5. September soybean futures are trading at $6.20. A $6.50 September soybean put is trading at a premium of 38 cents.
The time value is_____.

6. The time value of an option is typically greatest when an option is _____-the-money.

7. All else being equal, an option with 60 days remaining until expiration has more or less time value than an option with 30 days remaining until expiration?_____.

8. If market volatility increases, the time value portion of the option generally_____.

See the answer guide at the back of this book.

Option Pricing Summary

In the final analysis, the three most important things you need to know about option premium determination are:

1. Premiums are determined by supply and demand, through competition between option buyers and sellers.

2. At expiration, an option will have only intrinsic value (the amount that can be realized by exercising the option). If an option has no intrinsic value at expiration, it will expire worthless. At expiration, an option has zero time value.

3. Prior to expiration, an option's premium will consist of its intrinsic value (if any) plus its time value (if any). If an option has no intrinsic value, its premium prior to expiration will be entirely time value.

Option Pricing Models

As you become more familiar with option trading, you will discover there are computerized option pricing models that take into consideration the pricing factors we have discussed here and calculate "theoretical" option premiums. These theoretical option values may or may not match what an option actually trades for. So, regardless of what a computer pricing model may say, the

final price of an option is discovered through the exchange's trading arena.

These computer programs also determine how much risk a particular option position carries. This information is used by professional option traders to limit their risk exposure. Some of the different option variables used to measure risk are delta, gamma, theta, vega.

Delta—The option variable you may hear discussed most often is delta and is used to measure the risk associated with a futures position. Delta measures how much an option premium changes given a unit change in the underlying futures price.

Gamma—This variable measures how fast an option's delta changes as the underlying futures price changes. Gamma can be used as a gauge to measure the risk associated with an option position much the same way as delta is used to indicate the risk associated with a futures position.

Theta—The option pricing variable, theta, measures the rate at which an option's time value decreases over time. Professional option traders use theta when selling options to gauge profit potential or when buying options to measure their exposure to time decay.

Vega—The option variable that measures market volatility, or the riskiness of the market.

As a novice to options trading, it is good to be aware of these terms, but more than likely you won't use them. Typically, these pricing variables are used by professional option traders and commercial firms.

What Can Happen to an Option Position

Earlier in the chapter, we went over several examples in which the intrinsic value of the option was determined based on whether or not an option was exercised. Hopefully, this gave you a better understanding of how to determine the intrinsic value of an option. But, in reality, there are three different ways of exiting an option position:

- **Offset**
- **Exercise**
- **Expiration**

The most common method of exit is by offset.

Offsetting Options

Options that have value are usually offset before expiration. This is accomplished by purchasing a put or call identical to the put or call you originally sold or by selling a put or call identical to the one you originally bought.

For example, assume you need protection against rising wheat prices. At the time, July wheat futures are trading at $3.75 a bushel and the $3.70 July wheat call is trading for 12 cents a bushel ($.05 intrinsic value + $.07 time value). You purchase the July wheat call. Later, July wheat moves to $4.00 and the $3.70 July wheat call option is trading for a premium of 33 cents a bushel ($.30 intrinsic value + $.03 time value). You exit the option position by selling back the $3.70 call for its current premium of 33 cents.

The difference between the option purchase price and sale price is 21 cents a bushel ($.33 premium received when sold - $.12 premium paid when bought), which can be used to reduce the cost of wheat you are planning to buy.

Offsetting an option before expiration is the only way you'll recover any remaining time value. Offsetting also prevents the risk of being assigned a futures position (exercised against) if you originally sold an option.

Your net profit or loss, after a commission is deducted, is the difference between the premium

paid to buy (or received to sell) the option and the premium you receive (or pay) when you offset the option. Market participants face the risk there may not be an active market at the time they choose to offset, especially if the option is deep out-of-the-money or the expiration date is near.

Exercising Options

Only the option buyer can exercise an option and can do so at any time during the life of the option, regardless of whether it is a put or a call. When an option position is exercised, both the buyer and the seller of the option are assigned a futures position. Here is how it works. The option buyer first notifies their broker that they want to exercise an option. The broker then submits an exercise notice to the Chicago Board of Trade Clearing Services Provider. An exercise notice must be submitted to the Clearing Services Provider by 6:00 p.m. on any business day so that the exercise process can be carried out that night.

Once the Clearing Service Provider receives an exercise notice, it creates a new futures position at the strike price for the option buyer. At the same time, it assigns an opposite futures position at the strike price to a randomly selected clearing member who sold the same option. See the chart below. The entire procedure is completed before trading opens the following business day.

Futures Positions After Option Exercise

	Call option	Put option
Buyer assumes	Long futures position	Short futures position
Seller assumes	Short futures position	Long futures position

The option buyer would exercise only if an option is in-the-money. Otherwise, the option buyer would experience a market loss. For example, suppose you are holding a $2.50 put option and the futures market reaches $3.00. By exercising your $2.50 put option you would be assigned a short futures position at $2.50. To offset the position you would end up buying futures at $3.00, thus experiencing a 50-cent loss ($2.50 - $3.00 = -$.50).

Because option buyers exercise options when an option is in-the-money, the opposite futures position acquired by the option seller upon exercise will have a built-in loss. But this does not necessarily mean the option seller will incur a net loss. The premium the seller received for writing the option may be greater than the loss in the futures position acquired through exercise.

For example, assume an option seller receives a premium of 25 cents a bushel for writing a soybean call option with a strike price of $6.50. When the underlying futures price climbs to $6.65, the call is exercised. The call seller will thus acquire a short futures position at the strike price of $6.50. Since the current futures price is $6.65, there will be a 15-cent per bushel loss in the futures position. But, because that's less than the 25 cents received for writing the option, the option seller still has a 10-cent per bushel net profit. This profit can be locked in by liquidating the short futures position through the purchase of an offsetting futures contract.

On the other hand, suppose the futures price at the time the option was exercised had been $6.85 per bushel. In this case, the 35-cent loss on the short futures position acquired through exercise would exceed the 25-cent premium received for writing the call. The option seller would have a 10-cent per bushel net loss. And, had the futures price been higher, the net loss would have been greater.

The only alternative an option seller has to avoid exercise is to offset their short option position by buying an identical option prior to being

assigned an exercise notice by the Clearing Service Provider. Once the notice of exercise has been assigned, the alternative of purchasing an offsetting option is no longer available. The only alternative at this point will be to liquidate the futures position acquired through exercise by offsetting the assigned futures contract.

If, for some reason, you are holding an in-the-money option at expiration, the Chicago Board of Trade Clearing Service Provider will automatically exercise the option unless you give notice to the Clearing Service Provider before expiration.

Letting an Option Expire

The only other choice you have to exit an option position is to let the option expire—simply do nothing, anticipating the option will have no value at expiration (expire worthless). In fact, the right to hold the option up until the final day for exercising is one of the features that makes options attractive to many. So if the change in price you've anticipated doesn't occur, or if the price initially moves in the opposite direction, you have the assurance that the most an option buyer can lose is the premium paid for the option. On the other hand, option sellers have the advantage of keeping the entire premium they earned provided the option doesn't move in-the-money by expiration.

Note: As an option trader, especially as an option buyer, you should not lose track of your option value, even if it is out-of-the-money (without intrinsic value) because you still may be able to recover any remaining time value through offset.

Even hedgers who use options for price protection may offset their long option position sooner than originally expected. The time value recovered through offset lowers the expected cost of risk management. In this situation, the hedger will usually take another position in the cash, futures or option markets to ensure they still have price protection for the time period they want.

Quiz 7

QUIZ

Multiple Choice:
Select the best answer to each of the following questions.

1. The buyer of an option can:
(a) sell the option
(b) exercise the option
(c) allow the option to expire
(d) all of the above

2. Upon exercise, the seller of a call:
(a) acquires a long futures position
(b) acquires a short futures position
(c) acquires a put
(d) must pay the option premium

3. Funds must be deposited to a margin account by:
(a) the option seller
(b) the option buyer
(c) both the option buyer and the seller
(d) neither the option buyer nor the seller

4. Premiums for options are:
(a) specified in the option agreement
(b) arrived at through competition between buyers and sellers
(c) determined at the time an option is offset

5. The components of option premiums are:
(a) intrinsic value, if any
(b) time value, if any
(c) the sum of (a) and (b)
(d) the strike price and brokerage commission

6. What two factors have the greatest influence on an option's premium?
(a) the length of time remaining until expiration and volatility
(b) time and interest rates
(c) interest rates and volatility

7. Assume you pay a premium of 27 cents per bushel for a soybean call with a strike price of $6.00. At the time, the futures price is $6.25. What is the option's time value?
(a) 2 cents/bu
(b) 25 cents/bu
(c) 27 cents/bu

8. Assume the same facts as in question 7 except at expiration the futures price is $5.50. What is the option's intrinsic value?
(a) 50 cents/bu
(b) 20 cents/bu
(c) 0

9. If you pay a premium of 10 cents per bushel for a corn put option with a strike price of $2.60, what's the most you can lose?
(a) 10 cents/bu
(b) $2.60/bu
(c) your potential loss is unlimited

10. If you sell (write) a call option and receive a premium of 30 cents per bushel, what's the most you can lose?
(a) 30 cents/bu
(b) the initial margin deposit
(c) your potential loss is unlimited

11. Assume you pay a premium of 30 cents per bushel for a call with a strike price of $6.00 and the futures price at expiration is $6.50. How much is the option in the money?
(a) 30 cents/bu
(b) 50 cents/bu
(c) 20 cents/bu
(d) 80 cents/bu

See the answer guide at the back of this book.

Chapter Five

Option Hedging Strategies for Buying Commodities

Introduction to Risk Management Strategies

The primary purpose of Chapters 5 and 6 is to familiarize you with the many different ways in which options on agricultural futures can be used to achieve specific objectives. Upon completion of this section of the course, you should be able to:

- **recognize situations in which options can be utilized**
- **determine the most appropriate option strategy to accomplish a particular goal**
- **calculate the dollars and cents outcome of any given strategy**
- **compare options with alternative methods of pricing and risk management such as futures hedging and forward contracting**
- **explain the risks that may be involved in any particular strategy**

The strategies that are covered in Chapters 5 and 6 include:

Strategies for Commodity Buyers (Chapter 5)

1. Buy futures for protection against rising prices
2. Buy calls for protection against rising prices and opportunity if prices decline
3. Sell puts to lower your purchase price in a stable market
4. Buy a call and sell a put to establish a purchase price range
5. Cash purchase without risk management

Strategies for Commodity Sellers (Chapter 6)

1. Sell futures for protection against falling prices
2. Buy puts for protection against falling prices and opportunity if prices rally
3. Sell calls to increase your selling price in a stable market
4. Buy a put and sell a call to establish a selling price range
5. Cash sale without risk management

If you could describe options in one word, the word would be *versatile*. The better you understand options, the more versatile they become. You start to recognize opportunities for using options that otherwise may not have occurred to you. And, of course, the better you understand options, the more skillful you become in using them.

The key to using options successfully is your ability to match an appropriate strategy to a particular objective at a given time—like choosing the right "tool" to do a given job. Naturally, no individual is likely to use all possible option strategies for the simple reason that no individual is likely to have a need for every possible strategy. However, the pages that follow will suggest several situations in which the knowledge you have acquired about options will give you a significant advantage over those who are not familiar with the many benefits they offer.

As we indicated, the attractiveness of options lies in their versatility:

- **They can be used for protection against declining prices or against rising prices.**

- **They can be used to achieve short-term objectives or long-term objectives.**

- **They can be used conservatively or aggressively.**

The strategy discussions in this section are intended to serve a dual purpose. The first is to demonstrate the versatility of options and help you achieve a higher level of familiarity with the mechanics of option trading. The second is to provide a "reference guide" to option strategies so that, as opportunities become available for using options, you can readily refer to the specific strategy or strategies that may be appropriate.

A suggestion: Rather than attempt, at the outset, to become a "master of every strategy," glance initially at the first paragraph of each strategy discussion, which describes the situation and objective for using the strategy. Then focus your attention on those strategies that seem most pertinent to your business and that correspond most closely to your objectives. You may want to come back to the others later to increase your knowledge of the many ways in which options can be used. You will note that every strategy discussion and illustration is followed by a brief quiz relating specifically to that strategy. This can serve as a useful test of your understanding.

Why Buy or Sell Options?

There are so many things you can do with options that the reasons for buying or selling them are as diversified as the marketplace itself.

In the case of purchasing options, hedgers typically buy them to achieve price protection. If you are worried prices will rise before you have a chance to purchase the physical commodity, you would buy a call option. Call options allow you to establish a ceiling price for a commodity you are planning to purchase. On the other hand, if you are worried prices will fall before you have a chance to sell your physical product or crop, you would buy a put option. Puts allow you to establish a minimum (floor) selling price.

In both cases, you're not locked in at the ceiling or floor price as you are with futures or forward contracting. If the market moves in a favorable direction after purchasing an option, you can abandon the option and take advantage of current prices. That is different than a futures hedge, which locks in a specific price. However, the cost of the option is deducted from (or added to) the final sale (or purchase) price.

Selling options is a little different. The reason people sell options can be stated in just a few words: *to earn the option premium.* This applies to both the writing of calls and of puts. Whether to write a call or a put depends largely on one's cash market position or price outlook.

Generally, call options are written by those who do not expect a substantial price increase. They may even be bearish in their price expectations. In any case, they hope the underlying futures price will not rise to a level that will cause the option to be exercised. If an option expires without being exercised, the option seller earns the full option premium.

Puts, on the other hand, are generally sold by those who do not expect a substantial decrease in price. They may even have a bullish outlook. They hope the underlying futures price will not fall to a level that will cause the option to be exercised. If the put expires without being exercised, the option seller earns the full option premium.

Instead of waiting, crossing your fingers in the hope an option will not be exercised, an option seller can always offset the option position before it expires. Under this scenario, the

option seller would earn the price difference between the sale price and purchase price.

Which Option to Buy or Sell

A common denominator of all option strategies is the need to decide specifically which option to buy or sell: an option with a short time remaining until expiration or with a long time remaining until expiration? An option that is currently out-of-the-money, at-the-money, or in-the-money? As you learned earlier, option premiums reflect both the time remaining until expiration and the option strike price relation to the current underlying quoted futures price. It follows that different options, therefore, have different risk-reward characteristics.

Generally, the decision as to which option contract month to buy or sell will be dictated by the time frame of your objective. For example, if it is summer and your objective is to achieve protection against declining soybean prices between now and harvest, you would likely want to purchase a November put option. On the other hand, if it is winter and you want protection from a possible corn price decrease during the spring, you would probably want to purchase a May put option. As we discussed in the "Option Pricing" section of Chapter 4, the longer the time until the option expires, the higher the premium provided all other factors are equal.

When it comes to choosing the option strike price, however, there is no easy rule of thumb. Your decision may be influenced by such considerations as: In your judgment, what is likely to happen to the price of the underlying futures contract? How much risk are you willing to accept? And (if your objective is price protection), would you rather pay a smaller premium for less protection or a larger premium for more protection? Options with a wide range of strike prices provide a wide range of alternatives.

Several brief examples, below, illustrate how and why.

Example 1

Assume it is late spring and you would like protection against lower soybean prices at harvest. The November futures price is currently quoted at $6.75. For a premium of 25 cents, you may be able to purchase a put option that lets you lock in a harvesttime selling price of $6.75 plus your local basis. Or, for a premium of 15 cents, you may be able to buy a put that lets you lock in a harvesttime selling price of $6.50 plus the basis. If prices subsequently decline, the higher-priced option provides you with up to 25 cents more protection; but, if prices rise, the savings on the cost of the lower-priced option will add another 10 cents (the difference in the premiums) to your net selling price. In effect, it is similar to deciding whether to buy an automobile insurance policy with a small deductible or a larger deductible.

Example 2

Assume you decide to purchase a corn call option for protection against a possible spring price increase. If the May futures price is currently $2.70 and you pay 8 cents for an out-of-the-money call with a $2.80 strike price, you will be protected from any price increase above $2.88 (strike price + premium). But, if you pay a premium of 15 cents for an at-the-money call with a strike price of $2.70, you will be protected from any price increase above $2.85 (strike price + premium). The out-of-the-money option, however, is cheaper than the at-the-money option—your out-of-pocket expense is the 8-cent premium (rather than the $.15 premium) if prices decline rather than increase.

Example 3

In anticipation that wheat prices will remain steady or decrease slightly over the next four

months, you decide to sell a call option to earn the option premium. If you are strongly bearish about the price outlook, you might want to earn a premium of 17 cents by writing an at-the-money $3.40 call. But, if you are only mildly bearish or neutral about the price outlook, you might wish to write an out-of-the-money $3.50 call at a premium of 13 cents. Although the premium income is less, the out-of-the-money call gives you a 10-cent "cushion" against the chance of rising prices. That is, you would still retain the full 13-cent premium if, at expiration, the futures price had risen to $3.50.

In each of these illustrations—and, indeed, in every option strategy—the choice is yours. The important thing is to be aware of the choices and how they affect the risks and rewards.

The Buyer of Commodities

Commodity buyers are responsible for the eventual purchase of physical raw commodities (e.g., corn, soybeans, wheat, oats) or derivatives of the raw commodities (e.g., soybean meal, soybean oil, fructose, flour). For example, commodity buyers can be food processors, feed manufacturers, feedlots, livestock producers, grain merchandisers, or importers. They share a common risk—rising prices. Additionally, commodity buyers share a common need—price risk management. The following strategies illustrate a variety of strategies with varying degrees of risk management that can be used by commodity buyers.

Strategy #1: Buying Futures

Protection Against Rising Prices

The current time period is mid-summer and you need to purchase wheat during the first half of November. The December wheat futures are trading at $3.50/bushel. Your business can realize a profit at this price level but may sustain a loss if the prices rally much higher. To lock in this price, you take a long position in December wheat futures. Although, you are protected if the prices move higher, you will not be able to benefit should the prices move to a lower price.

Based on historical basis records in your area, you expect the basis to be about 10 cents under the December wheat futures price. As a buyer of commodities, your purchase price will improve if the basis weakens and worsen if the basis strengthens. For example, if the basis turns out to be stronger at 5 cents under, then your purchase price will be 5 cents higher than expected. If the basis weakens to 20 cents under, then your purchase price will be 10 cents lower than expected.

Action

In August you purchase a December wheat futures contract at $3.50/bushel.

Expected Purchase Price =

Futures price +/- Expected basis

$3.50 - .10 = $3.40/bushel

Long December wheat futures at $3.50/bushel

If Dec wheat futures are:	Basis	Cash price	Long futures gain(-)/loss(+)	Actual buying price
3.00	-.10	2.90	+ .50 (L)	3.40
3.25	-.10	3.15	+ .25 (L)	3.40
3.50	-.10	3.40	0	3.40
3.75	-.10	3.65	- .25 (G)	3.40
4.00	-.10	3.90	- .50 (G)	3.40

Results
Assuming basis turns out to be 10 cents under December futures in November and the December wheat futures move above $3.50/bushel, the higher price you pay for the physical wheat will be offset by a gain in your futures position. If December wheat futures moves below $3.50/bushel, you will pay a lower price for the physical wheat but you will have a loss on your long futures position. Note the different price scenarios for the November time period. Regardless, if December wheat futures moves higher or lower, the effective purchase price will be 3.40/bushel provided the basis turns out to be 10 cents under. A change in the basis will affect the purchase price.

Strategy #2: Buying Call Options

Protection Against Higher Prices and Opportunity if Prices Decline

Assume you are a buyer who needs to establish a wheat purchase price for November delivery. The time is August and the December wheat futures price is $3.50 per bushel. At this level, you decide to use options to protect your flour purchase price and related profit margins against a significant rise in the price of wheat. By buying call options you'll be protected from a price increase yet retain the downside opportunity should prices fall between now and November.

The cash market price for wheat in your region is typically about 10 cents below the December futures price during November. This means the normal basis during late fall is 10 cents under, and, given the current market conditions, you expect this to hold true this year. Therefore, if the December futures price in November is $3.50, the cash price in your suppliers' buying region is expected to be about $3.40 per bushel.

Premiums for December wheat call and put options are currently quoted as follows:

Option strike price	Call option premium	Put option premium
$3.10	$.41	$.01
$3.20	$.33	$.04
$3.30	$.27	$.08
$3.40	$.21	$.12
$3.50	$.15	$.16
$3.60	$.11	$.22
$3.70	$.07	$.28
$3.80	$.03	$.34
$3.90	$.01	$.41

Expected Buying Price
To compare the price risk exposure for different call option strikes simply use the following formula:

Maximum (ceiling) Buying Price =
Call strike price + premium paid +/- basis

In the current example, the comparison between the $3.40 call and the $3.50 call would be:

Call	+	Premium	-	Basis	=	Ceiling price
$3.40	+	$.21	-	$.10	=	$3.51
$3.50	+	$.15	-	$.10	=	$3.55

As you can see, greater price protection involves a somewhat higher cost.

Action
After considering the various option alternatives, you purchase the $3.50 call for 15 cents, which provides protection above the current market price level.

Scenario #1: Prices Rise
If prices rise, and assuming the basis remains unchanged at 10 cents under, you will pay a maximum of $3.55/bushel for wheat. That is, the option strike price ($3.50) plus the premium paid for the option ($.15) less the basis ($.10 under).

Assume the December futures price has risen to $4.50 and your supplier is offering cash wheat at $4.40 ($4.50 futures price - $.10 basis).

With the futures price at $4.50, the call option with a strike price of $3.50 can be sold for at least its intrinsic value of $1.00. Deducting the 15-cent premium paid for the option gives you a net gain of 85 cents/bushel. The cash market price of $4.40 less the 85-cent gain gives you an effective buying price of $3.55/bushel.

Scenario #2: Prices Decrease
If December wheat futures prices decrease below the $3.50 strike price, your option will not have any intrinsic value but may have some remaining time value. To receive the remaining time value and lower the purchase price, you should attempt to offset the option. Your net wheat flour price will be directly related to the cash price for wheat plus the premium you initially paid for the option minus any time value you recover. If the option doesn't have any time value, you can allow the option to expire worthless.

For example, assume the December wheat futures price at the time you procure your cash wheat needs has decreased to $3.00 and your supplier is offering a local price of $2.90 (futures price less the basis of $.10 under). You allow the option to expire since it has no intrinsic or time value. The net price you pay for wheat, equals $3.05 ($2.90 cash price + $.15 option premium paid).

Whether the market price has gone up or down, the following formula allows you to calculate the net price for the basic ingredient (wheat in this scenario) you are buying:

Futures price when you purchase the ingredient
+/- Local basis at the time of your purchase
+ Premium paid for the option
- Premium received when option offset (if any)
= Net purchase price

Results
Note the different price scenarios for the November time period. Regardless of the price increase in cash wheat, the maximum purchase price is $3.55/bushel because of the increasing profits in the long call option position. As prices decline, the wheat buyer continues to improve on the effective buying price.

Long 3.50 December wheat call at $.15/bushel premium

If Dec wheat futures are:	Basis	Cash price	Long futures gain(-)/loss(+)	Effective buying price
3.00	-.10	2.90	+ .15 (L)	3.05
3.25	-.10	3.15	+ .15 (L)	3.30
3.50	-.10	3.40	+ .15 (L)	3.55
3.75	-.10	3.65	- .10 (G)	3.55
4.00	-.10	3.90	- .35 (G)	3.55

Quiz 8

QUIZ

1. **Assume you pay a premium of 13 cents per bushel for a January soybean call with a $6.40 strike price, and the basis is 20 cents over in December.**

   What is the net price for soybeans if the January soybean futures price in December is the price shown in the left-hand column?

January soybean futures	Net price
$6.20	$_____per bu
$6.80	$_____per bu
$7.40	$_____per bu

2. **Assume you buy a March corn call option with a strike price of $2.30 at a premium cost of 8 cents a bushel. Also assume, in February, your corn supplier usually quotes you a price of 10 cents under March futures. What would your net price be if the March futures price in February is the price shown in the left-hand column?**

March futures price	Net price
$2.80	$_____per bu
$2.60	$_____per bu
$2.20	$_____per bu

See the answer guide at the back of this book.

Strategy #3: Selling Put Options

Lower Your Buying Price in a Stable Market

If you anticipate the market remaining stable, you can lower the buying price of your ingredients by selling (going "short") a put option. By selling a put option as a commodity buyer, you can lower the purchase price of your ingredients by the amount of premium received provided the market remains relatively stable.

If the futures market falls below the put's strike price, you'll be able to buy the cash commodity at a lower price than you originally expected (the cash and futures markets generally move parallel to each other), but you will lose on the short put. If the futures market falls below the strike price by more than the premium, your losses on the short put offset the lower price paid to your supplier. If the futures market rallies, the only protection you have against the higher cash price is the premium collected from selling the put. Also, because selling options involves market obligations, margin funds must be posted with your broker.

Action

Assume again you are a wheat buyer for a food manufacturer that that needs to establish a price for mid-November delivery. It is August, the December wheat futures price is $3.50 per bushel, and you expect wheat prices to trade in a narrow range through the next several months. Also, assume out-of-the-money December wheat puts (i.e., strike price of $3.30) are trading at 8 cents a bushel. The expected basis is 10 cents under December. You decide to sell December $3.30 puts to reduce the actual price you pay for cash wheat between now and November. (The December contract is used because it most closely follows the time you plan to take delivery of your ingredients.)

To calculate the expected floor purchase price simply use the following formula:

Minimum (floor) Buying Price =
Put strike price - premium received +/- expected basis

$3.30 put strike - $.08 premium - $.10 basis = $3.12

With this strategy, the effective purchase price will increase if the futures price rises above the put strike price. Once that happens, your protection is limited to the premium received and you will pay a higher price for wheat in the cash market.

Results
Your effective buying price will depend on the actual futures price and basis (10 cents under as expected) when you purchase your cash wheat. In this example, the table below lists the net wheat prices as a result of various futures price levels.

As the equation indicates, after adjusting for the basis, premium received from the sale of the puts reduces the effective purchase price of wheat. But there are risks when selling options. If prices fall below the put strike price, there is the possibility you will be exercised against and assigned a long futures position at any time during the life of the option position. This would result in a position loss equal to the difference between the strike price and the futures market price. This loss offsets the benefit of a falling cash market, effectively establishing a floor price level. In contrast, if the market price increases, your upside protection is limited only to the amount of premium collected.

Futures price is:	-	Actual basis	=	Cash price	+/-	Short put gain (-)/loss (+)	=	Net buying price
$3.00	-	$.10	=	$2.90	+	$.22 (L)	=	$3.12
$3.25	-	$.10	=	$3.15	-	$.03 (G)	=	$3.12
$3.50	-	$.10	=	$3.40	-	$.08 (G)	=	$3.32
$3.75	-	$.10	=	$3.65	-	$.08 (G)	=	$3.57
$4.00	-	$.10	=	$3.90	-	$.08 (G)	=	$3.82

Quiz 9

QUIZ

1. **If you sell an October soybean oil put with a strike price of 25 cents for 1 cent per pound and the expected basis is $.005/lb under October, what is your expected net floor and ceiling price?**

   Ceiling price_____ Floor price_____

2. **What is your gain or loss on the 25-cent soybean oil put option you sold if: (*Hint:* Assume it is close to option expiration and there is no remaining time value.)**

Futures price is:	Put gain/loss	Futures price is:	Put gain/loss
$.22	_____	$.25	_____
$.23	_____	$.26	_____
$.24	_____	$.27	_____

3. **Using your answers from Question 2, what will be the effective purchase price for soybean oil if: (*Hint:* Assume the basis is $.01/lb under October and it is close to option expiration so there is no remaining time value.)**

Futures price is:	Effective purchase price	Futures price is:	Effective purchase price
$.22	$_____ per lb	$.25	$_____ per lb
$.23	$_____ per lb	$.26	$_____ per lb
$.24	$_____ per lb	$.27	$_____ per lb

See the answer guide at the back of this book.

Strategy #4 Buy a Call and Sell a Put

Establish a Buying Price Range

This long hedging strategy provides you with a buying price range. Purchasing a call option creates a ceiling price and selling a put establishes a floor price. The strike prices of the options determines your price range. You would choose a lower strike price for the put option (i.e., a floor price) and a higher strike price for the call option (i.e., a ceiling price). As with all strategies, the range selected depends on your company's price objectives and risk exposure. The premium received from selling the put allows you to reduce the premium cost of the call. You effectively lower the ceiling price by selling the put.

Once more, assume you are buying wheat for your firm and decide to use wheat options to establish a price range for requirements between August and November. As described in Strategy #1, December wheat futures are at $3.50 a bushel and the expected buying basis in November is generally 10 cents under December wheat futures. The premiums for the December wheat call and put options (the same as used in Strategies #2 and #3) are:

Strike price	Call option premium	Put option premium
$3.10	$.41	$.01
$3.20	$.33	$.04
$3.30	$.27	$.08
$3.40	$.21	$.12
$3.50	$.15	$.16
$3.60	$.11	$.22
$3.70	$.07	$.28
$3.80	$.03	$.34
$3.90	$.01	$.41

Action

You first need to calculate the "buying price range" that fits your risk tolerance level. This is done by using the following formulas.

Maximum (ceiling) Purchase Price =
Call strike price + call premium paid - put premium received +/- expected basis

Minimum (floor) Purchase Price =
Put strike price + call premium paid - put premium received +/- expected basis

Using these formulas and the various option premiums, you can calculate different buying ranges based upon the strike prices chosen. The greater the difference between the call and put strike prices, the wider the purchase price range. Conversely, a smaller difference in the strike prices will result in a narrower purchase price range.

After considering various options, you decide to establish a buying price range by purchasing a $3.50 call for 15 cents and selling a $3.30 put for 8 cents. The call option was initially at-the-money and the put option was initially out-of-the-money.

Results

Regardless of what the futures market does, your net buying price will be no more than $3.47 ($3.50 call strike + $.15 call premium paid - $.08 put premium received - $.10 basis) and no less than $3.27 ($3.30 put strike + $.15 call premium paid - $.08 put premium received - $.10 basis), subject to any variation in the basis. The price range is 20 cents because this is the difference between the call and put strike prices.

Looking at the net results based on different futures prices scenarios in the table below confirms the establishment of a buying price range.

Dec. futures price at offset	-	Basis	=	Cash price	-/+	$3.50 Call gain (-)/loss(+)	-/+	$3.30 Put gain (-)/loss(+)	=	Net price
$3.00	-	$.10	=	$2.90	+	$.15 (L)	+	$.22 (L)	=	$3.27
$3.25	-	$.10	=	$3.15	+	$.15 (L)	-	$.03 (G)	=	$3.27
$3.50	-	$.10	=	$3.40	+	$.15 (L)	-	$.08 (G)	=	$3.47
$3.75	-	$.10	=	$3.65	-	$.10 (G)	-	$.08 (G)	=	$3.47
$4.00	-	$.10	=	$3.90	-	$.35 (G)	-	$.08 (G)	=	$3.47

*Long call option gain/loss = futures price - call strike price - call premium paid; maximum loss = premium paid

*Short put option gain/loss = futures price - put strike price + put premium received; maximum put profit = premium received

QUIZ

Quiz 10

1. **Assume you are a soybean buyer wanting to establish a buying price range. This time, you purchased a $6.00 March soybean call for 15 cents and sold a $5.50 March soybean put for 5 cents. The expected basis is 20 cents over the March soybean futures price.**

   What is your buying price range?

   Ceiling price_____ Floor price_____

2. **What is the gain or loss on the $6.00 call option you purchased if:**
   (*Hint:* Assume it is close to option expiration and there is no remaining time value.**)**

Futures price is:	**Call gain/loss**
$5.00	_____
$5.50	_____
$6.00	_____
$6.50	_____
$7.00	_____

3. **What is the gain or loss on the $5.50 put option you sold if:**
   (*Hint:* Assume it is close to option expiration and there is no remaining time value.**)**

Futures price is:	**Put gain/loss**
$5.00	_____
$5.50	_____
$6.00	_____
$6.50	_____
$7.00	_____

4. **Using your answers from Questions 2 and 3, what will be the effective purchase price if: (*Hint:*** Assume the actual basis is $.20/bu over the March soybean futures price and it is close to option expiration so there is no remaining time value.**)**

Futures price is:	**Effective purchase price**
$5.00	$_____ per bu
$5.50	$_____ per bu
$6.00	$_____ per bu
$6.50	$_____ per bu
$7.00	$_____ per bu

See the answer guide at the back of this book.

Comparing Commodity Purchasing Strategies

A commodity buyer should realize that there isn't one "perfect" strategy for all firms or for all market conditions. Different economic conditions require different purchasing strategies. Therefore, an astute commodity buyer should become familiar with all of the available purchasing strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised, even in the middle of a purchasing cycle, due to changing market conditions.

The purchasing strategies we looked at in this chapter are some of the more common ones, but by no means, are they to be considered a complete list of purchasing strategies. Each firm with their own risk/reward profiles will have to make a decision—which strategy is the best for their needs.

The following chart compares four purchasing strategies involving futures or options and one strategy without price risk management. Each of the strategies has strengths and weaknesses, which will be discussed in the following paragraphs.

Note: All of the following strategies being compared assume a basis of 10 cents under the December wheat futures contract. If the basis turns out to be anything other than 10 cents under the December contract, the effective purchase price will be different. A stronger basis would increase the purchase price and a weaker than expected basis would lower the effective purchase price.

Long Futures

The long futures position is the most basic price risk management strategy for a commodity buyer. This strategy allows the commodity buyer to **"lock in a price level"** in advance of the actual purchase. It provides protection against the risk of rising prices but does not allow improvement in the purchase price should the market decline. This position requires the payment of a broker's commission as well as the costs associated with maintaining a margin account. In the following table, the long futures position fares the best when the market moves higher (i.e., when the price risk occurs).

Long Call Option

The long call option position provides protection against rising commodity prices but also allows the buyer to improve on the purchase price if the market declines. The long call position **"establishes a maximum (ceiling) price level."** The protection and opportunity of a long call option position comes at a cost—the call option buyer must pay the option premium at the time of the purchase. In the table, the long call option provides upside price protection similar to the long futures position except at a cost. Unlike the long futures position, the long call option nets a better purchase price when the market declines.

If Dec. wheat futures is at:	Long futures	Long call	Short put	Long call/ short put	Do nothing
3.00	3.40	3.05	3.12	3.27	2.90
3.25	3.40	3.30	3.12	3.27	3.15
3.50	3.40	3.55	3.32	3.47	3.40
3.75	3.40	3.55	3.57	3.47	3.65
4.00	3.40	3.55	3.82	3.47	3.90

Short Put Option
Although the short put option position is the riskiest of the strategies that we covered in this publication, it provides the best purchase price in a stable market, as seen in the table. However, if the market declines, the put option **"establishes a minimum (floor) purchase price level."** The worse case scenario for this strategy is if the market rallies because the upside protection is limited to the premium collected for selling the put.

Long Call Option and Short Put Option
By combining the short put position with the long call position, the commodity buyer establishes a lower ceiling price level because of the premium received for selling the put. However, the cost of this benefit is that the short put position limits the opportunity of lower prices by establishing a floor price level. Effectively, the commodity buyer **"established a purchase price range"** with this strategy. The price range is determined by the strike prices and therefore can be adjusted (widened or narrowed) by choosing alternative strike prices. After the long futures position, this strategy provided the most protection against rising prices, as noted in the table.

Do Nothing
Doing nothing to manage purchasing price risk is the most simplistic strategy for a commodity buyer—but also the most dangerous should the market rally. Doing nothing will yield the best purchase price as the market declines but **"provides zero risk management"** against a rising market, as indicated in the table.

Other Purchasing Strategies
There are many other purchasing strategies available to a commodity buyer. These strategies may involve futures, options or cash market positions and each will have their own set of advantages and disadvantages. As stated earlier in this chapter, a good commodity buyer should acquaint themselves with all of their alternatives and understand when a specific strategy should be employed or revised. Remember, a strategy that worked effectively for one commodity purchase may not be the best for your next commodity purchase.

Chapter Six

Option Hedging Strategies for Selling Commodities

The Seller of Commodities

Commodity sellers, similar to commodity buyers, are potential hedgers because of their need to manage price risk. Commodity sellers are individuals or firms responsible for the eventual sale of the physical raw commodities (e.g., wheat, rice, corn) or derivatives of the raw commodities (e.g., soybean meal, flour). For example, commodity sellers can be farmers, grain elevator, grain cooperatives, or exporters. Although they have different functions in the agricultural industry, they share a common risk—falling prices and a common need to manage that price risk. The following strategies for commodity sellers provide different risk management benefits.

Strategy #1: Selling Futures

Protection Against Falling Prices

As a soybean producer, who just completed planting, you are concerned that prices will decline between spring and harvest. With November soybean futures currently trading at $6.50/bushel and your expected harvest basis of $.25 under November soybean futures, the market is at a profitable price level for your farm operation. To lock in this price level, you take a short position in November soybean futures. Although you are protected should the prices move lower than $6.50, this strategy will not allow you to improve your selling price if the market moves higher.

A short futures position will increase in value to offset a lower cash selling price as the market declines and it will decrease in value to offset a higher cash selling price as the market rallies. Basically, a short future position locks in the same price level regardless of which direction the market moves.

The only factor that will alter the eventual selling price is a change in the basis. If the basis turns out to be stronger than the expected 25 cents under, then the effective selling price will be higher. For example, if the basis turns out to be 18 cents under November at the time you sell your soybeans, the effective selling price will be 7 cents better than expected. If the basis weakens to 31 cents under at the time of the cash soybean sale, then the effective selling price will be 6 cents lower than expected.

Action

In the spring, you sell November soybean futures at $6.50/bushel.

Expected Selling Price =

Futures price +/- expected basis =
$6.50 - .25 = $6.25//bushel

Results

Assuming the November soybean futures drops below $6.50 at harvest and the basis is 25 cents under, as expected, the lower price you receive for your cash soybeans would be offset by a gain in your short futures position. If November soybeans futures rallies above $6.50 and the basis is 25 cents under, the higher selling price you receive for the soybeans will be offset by a loss on the short futures position.

Short November Soybean Futures at $6.50/bushel								
If Nov. soybean futures is at:	+/-	Basis	=	Cash price	+/-	Short futures gain(+)/loss(-)	=	Actual selling price
$5.50	-	$.25		$5.25	+	$1.00(G)		$6.25
$6.00	-	$.25		$5.75	+	$ .50(G)		$6.25
$6.50	-	$.25		$6.25		0		$6.25
$7.00	-	$.25		$6.75	-	$ .50(L)		$6.25
$7.50	-	$.25		$7.25	-	$1.00(L)		$6.25

Note the different price scenarios for the harvest time period (October) in the table above. Regardless of the November soybean futures moving higher or lower, the effective cash selling price will be $6.25/bushel if the basis is 25 cents under. Any change in the basis will alter the effective selling price.

If the basis was stronger (20 cents under) when futures were at $5.50, the effective selling price would have been $6.30. If the basis weakened (30 cents under) when futures were at $7.50, the effective selling price would have been $6.20.

Strategy #2: Buying Put Options

Protection Against Lower Prices and Opportunity if Prices Rally

As a soybean producer whose crop has just been planted, you are concerned that there may be a sharp decline in prices by harvest in October. You would like to have protection against lower prices without giving up the opportunity to profit if prices increase. At the present time, the November futures price is quoted at $6.50 per bushel. The basis in your area during October is normally 25 cents under the November soybean futures price. Thus, if the November futures price in October is $6.50, local buyers are likely to be bidding about $6.25.

Premiums for November soybean put and call options with various strike prices are presently quoted as follows:

Put option strike price	Put option premium	Call option premium
$6.00	$.10	$.61
$6.20	$.19	$.51
$6.50	$.30	$.31
$6.80	$.49	$.21
$7.00	$.60	$.12

Expected Selling Price

To evaluate the expected minimum (floor) selling price and compare the price risk exposure from the various put options, use the following formula:

Minimum (floor) Selling Price =
Put strike - premium paid +/- expected basis

Comparing two of the put options from the previous chart:

$6.80 (strike) - $.49 (premium paid) - $.25 (expected basis) = $6.06 floor price

$6.50 (strike) - $.30 (premium paid) - $.25 (expected basis) = $5.95 floor price

As you can see, the greater protection comes from the put option with the higher strike prices and therefore, the greatest premium.

Action
You decide to use options to manage your price risk. After considering the various options available, you buy the $6.50 put (at-the-money) at a premium of 30 cents a bushel.

Scenario #1: Prices Decline
If prices decline and assuming the basis remains unchanged at 25 cents under, you will receive a minimum $5.95 per bushel for your crop. That is the option strike price ($6.50) minus the expected basis ($.25 under) less the premium paid for the option ($.30).

Assume the November futures price has declined to $5.50, and local buyers are paying $5.25 (futures price - the basis of $.25 under).

With the futures price at $5.50, the $6.50 put option can be sold for at least its intrinsic value of $1.00. Deducting the 30 cents you paid for the option gives you a net gain of 70 cents. That, added to the total cash market price of $5.25, gives you a total net return of $5.95 per bushel.

Scenario #2: Prices Increase
If prices increase, you will allow your put option to expire if there isn't any time value, because the right to sell at $6.50 when futures prices are in excess of $6.50 doesn't have any intrinsic value. Your net return will be whatever amount local buyers are paying for the crop less the premium you initially paid for the option.

Assume the futures price when you sell your crop has increased to $8.00, and local buyers are paying $7.75 (futures price - the basis of $.25 under).

You would either allow the option to expire if there isn't any time value or offset the put option if there is time value remaining. If you allow the put option to expire, your net return will be $7.45 (local cash market price of $7.75 - the $.30 premium paid).

Regardless of whether prices have decreased or increased, there is an easy way to calculate your net return when you sell your crop:

Futures price when you sell your crop
+/- Local basis at the time you sell
+ Premium paid for the option
- Option value when option offset (if any)
= Net selling price

Results
Note the different price scenarios for the October time period. Regardless of the price decline in soybeans, the minimum selling price is $5.95/bushel because of the increasing profits in the long put option position. As prices rally, the soybean seller continues to improve on the effective selling price. In other words, the soybean seller has protection and opportunity.

Long $6.50 November Soybean Put at $.30/bushel Premium

If Nov. soybean futures is at:	+/-	Basis	=	Cash price	+/-	Long put gain(+)/loss(-)	=	Actual selling price
$5.50	-	$.25		$5.25	+	$.70(G)		$5.95
$6.00	-	$.25		$5.75	+	$.20(G)		$5.95
$6.50	-	$.25		$6.25	-	$.30(L)		$5.95
$7.00	-	$.25		$6.75	-	$.30(L)		$6.45
$7.50	-	$.25		$7.25	-	$.30(L)		$6.95

Quiz 11

QUIZ

1. Assume that you pay a premium of 30 cents a bushel for a November soybean put option with a $6.50 strike price, and the basis is expected to be 25 cents under November futures when you sell your crop in October. What would your selling price be if the November soybean futures price at expiration (i.e., no time value) is the price shown in the left-hand column?

November futures price	Net return
$5.80	$ _____ per bu
$6.60	$ _____ per bu
$8.30	$ _____ per bu

2. Assume you buy a September corn put option with a strike price of $2.70 at a premium cost of 8 cents a bushel. Also, assume your local basis is expected to be 10 cents under September futures in August. What would your selling price be if the September futures price at expiration is the price shown in the left-hand column?

September futures price	Net return
$2.40	$ _____ per bu
$2.70	$ _____ per bu
$3.00	$ _____ per bu

See the answer guide at the back of this book.

Strategy #3: Selling Call Options

Increase Your Selling Price in a Stable Market

If you are expecting a relatively stable market, you can increase your selling price by selling (going short) a call option. As a commodity seller, you will increase the effective selling price by the amount of premium collected when you sell call options.

If the futures market price increases above the call strike price, you will be able to sell the cash commodity at a better price but you will begin to lose on the short call option position. If the market rallies above the call strike price by an amount greater than the premium collected, the losses on the short call with outweigh the increased cash selling price. As a result, this strategy locks in a maximum (ceiling) selling price level.

If the futures market declines below the strike price, the only protection you have against falling prices is the premium collected from selling the call option. Note, that by selling options, you have a market obligation and therefore you will be required to maintain a margin account. Additionally, as an option seller, you may be exercised on at any time during the life of the option. As with all risk management strategies, the effective selling price will be affected by any change in the expected basis.

Action
Assume you are a soybean producer who is planning to deliver soybeans in October at harvest and expect the harvest basis to be 25 cents under the November soybean futures. November soybean futures are currently trading at $6.50/bushel and you don't expect very much price movement in the months leading up to harvest. To enhance your effective selling price, you decide to sell the 6.80 November soybean call option (out-of the-money) for a premium of 21 cents per bushel.

Use the following formula to evaluate this strategy. This formula should also be used to compare this type of strategy using different strike prices:

Expected Maximum (ceiling) Selling Price	
Call Option Strike Price	6.80
+ Premium Received	.21
+/- Expected Basis	-.25
	$6.76

With this strategy, the effective selling price will decrease if the futures price falls below the call strike price. Once that happens, your price protection is limited to the premium collected and you will receive a lower selling price in the cash market.

Results
Your effective selling price will depend on the futures price and the actual basis when you sell your cash commodity. In this example, the following table lists the effective selling prices for a variety of futures price scenarios.

As the formula indicates, after adjusting for the actual basis, the premium received from the sale of the call increases the effective selling price. But note that there are risks associated with selling options. If prices rally above the call strike price, there is the possibility that you will be exercised on and assigned a short futures position at any time during the life of the call option. As the market rallies, the losses sustained on the short call position will offset the benefits of a higher cash price, thereby establishing a ceiling selling price ($6.46). In contrast, if the market prices decline, your downside price protection is limited to the amount of premium collected.

Strategy #4 Buy a Put and Sell a Call

Establish a Selling Price Range

This is a short hedging strategy with the net effect of creating both a floor price and a ceiling price. Let's assume you are a soybean farmer and you have just planted your crop. The November soybean futures contract is trading at $6.50 per bushel, and you anticipate the local basis to be 25 cents under by harvest. You like the idea of having downside price protection but if there is a market rally between now and fall, you won't be able to take advantage of it if you're short futures. Instead, you decide to buy a put option. You have downside protection but are

Short $6.80 Call Option for 21 cents Premium: Scenarios

Nov soybean futures at:	+/-	Basis	=	Cash price	+/-	Short call gain(+)/loss(-)	=	Net selling price
$5.50	-	$.25	=	$5.25	+	$.21(G)	=	$5.46
$6.00	-	$.25	=	$5.75	+	$.21(G)	=	$5.96
$6.50	-	$.25	=	$6.25	+	$.21(G)	=	$6.46
$7.00	-	$.25	=	$6.75	+	$.01(G)	=	$6.76
$7.50	-	$.25	=	$7.25	-	$.49(L)	=	$6.76

not locked in if prices rise. The only catch is the option premiums are a little higher than what you'd like to spend. What you can do to offset some of the option cost is establish a "fence" or "combination" strategy. With this type of strategy, you buy a put and offset some of the premium cost by selling an out-of-the-money call option.

However, this strategy establishes a selling price range where you can't benefit from a price rally beyond the call strike price. The premiums for the November soybean put options and the November soybean call options are:

Strike price	Put option premium	Call option premium
$6.00	$.10	$.61
$6.20	$.19	$.51
$6.50	$.30	$.31
$6.80	$.49	$.21
$7.00	$.60	$.12

Action

The first step would be to calculate "the selling price range" under various option scenarios. This is easily done by using the following formulas:

Floor price level =
Put strike price - put premium + call premium +/- expected basis

Ceiling price level =
call strike price - put premium + call premium +/- expected basis

After considering various alternatives, you decide to buy an at-the-money $6.50 put for 30 cents and sell an out-of-the-money $6.80 call for 21 cents. The strategy can be put on for a net debit of 9 cents per bushel, and the selling price range is well within your projected production costs plus profit margin.

Results

As shown in the table below, your net selling price will vary depending on what the November soybean futures price is when you offset your combination put/call (fence) strategy. What is interesting, is with the long put/short call strategy the net selling price will be anywhere from $6.16 to $6.46 provided the basis is 25 cents under.

Long $6.50 Put and Short $6.80 Call: Scenarios

Futures price at harvest	-	Actual basis	=	Cash price	+/-	Put gain(+)/loss(-)*	+/-	Call gain(+)/loss(-)**	=	Net selling price
$5.50	-	$.25	=	$5.25	+	$.70(G)	+	$.21(G)	=	$6.16
$6.00	-	$.25	=	$5.75	+	$.20(G)	+	$.21(G)	=	$6.16
$6.50	-	$.25	=	$6.25	-	$.30(L)	+	$.21(G)	=	$6.16
$7.00	-	$.25	=	$6.75	-	$.30(L)	+	$.01(G)	=	$6.46
$7.50	-	$.25	=	$7.25	-	$.30(L)	-	$.49(L)	=	$6.46

* Long put option gain/loss = put strike price – futures price – put premiums; maximum cost (loss) = premium paid

** Short call option gain/loss = call strike price – futures price + call premiums; maximum gain = premium received

QUIZ

Quiz 12

1. **Assume you are a soybean producer wanting to establish a selling price range. You purchase a $6.00 put for 11 cents and sell a $7.00 call for 12 cents. The expected basis is 25 cents under November soybean futures.**

   What is your anticipated selling price range?

   Floor price_____ Ceiling price_____

2. **What is the gain or loss on the $6.00 put option if:**
   (*Hint:* Assume it is close to option expiration and there is no remaining time value.**)**

Futures price is:	**Put gain/loss**
$5.25	_____
$5.50	_____
$6.75	_____
$7.00	_____
$7.25	_____

3. **What is the gain or loss on the $7.00 call option if:**
   (*Hint:* Assume it is close to option expiration so the option has no remaining time value.**)**

Futures price is:	**Call gain/loss**
$5.25	_____
$5.50	_____
$6.75	_____
$7.00	_____
$7.25	_____

4. **Using your answers from Questions 2 and 3, what will be the effective selling price for soybeans if: (*Hint:*** Assume the actual basis is $.30/bu under the November soybean futures price and it is close to option expiration, so the option has no remaining time value.**)**

Futures price is:	**Effective selling price**
$5.25	$_____ per bu
$5.50	$_____ per bu
$6.75	$_____ per bu
$7.00	$_____ per bu
$7.25	$_____ per bu

See the answer guide at the back of this book.

Comparing Commodity Selling Strategies

A commodity seller doesn't have one "perfect" strategy that will fit all market conditions. You need to realize that different economic conditions require different selling strategies. Therefore, a smart seller of commodities should become familiar with all of the available selling strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised due to changing market conditions.

The commodity selling strategies we looked at in this chapter are fairly common ones, but by no means, are they to be considered an all inclusive list of selling strategies. Each individual or firm with their own risk/reward profiles will have to make the ultimate decision—what strategy is the best for their risk management needs.

The following chart compares four commodity selling strategies involving futures or options and one strategy not involving price risk management. Each of the strategies has their own strengths and weaknesses, which will be discussed in the following paragraphs.

Short Futures

The short futures position is the most basic price risk management strategy for a commodity seller. This strategy allows the commodity seller to **"lock in a price level"** in advance of the actual sale. It provides protection against the risk of falling prices but does not allow improvement in the selling price should the market rally. This position requires the payment of a broker's commission, as well as the costs associated with maintaining a margin account. In the comparison chart, the short futures position fares the best when the risk occurs as the market moves lower.

Long Put Option

The long put option position provides protection against falling commodity prices but also allows the seller to improve on the selling price if the market rallies. The long put position **"establishes a minimum (floor) selling price level."** The protection and opportunity of a long put option position comes at a cost—the put option buyer must pay the option premium. In the comparison chart, the long put option provides upside price protection similar to the short futures position with the difference being the cost of the protection—the premium. Unlike the short futures position, the long put option nets a better selling price when the market rallies. When buying a put option, you must pay a brokerage commission but you do not have a margin account to maintain.

If Nov. soybean futures are at:	Short futures	Long put	Short call	Long put/ short call	Do nothing
5.50	6.25	5.95	5.46	6.16	5.25
6.00	6.25	5.95	5.96	6.16	5.75
6.50	6.25	5.95	6.46	6.16	6.25
7.00	6.25	6.45	6.76	6.46	6.75
7.50	6.25	6.95	6.76	6.46	7.25

Note: All of the strategies being compared assume a basis of 25 cents under the November futures contract. If the basis turns out to be anything other than 25 cents under the November futures contract, the effective selling price will be different. A stronger basis would increase the selling price and a weaker than expected basis would lower the effective selling price

Short Call Option
Although the short put option position is the riskiest of the selling strategies covered in this section, it provides the best selling price in a stable market, as seen in the comparison chart. However, if the futures market price increases, the put option **"establishes a maximum (ceiling) selling price level."** The worse case scenario for this strategy is if the market declines significantly because the downside protection is limited to the premium collected for selling the call.

Long Put Option and Short Call Option
By combining the short call position with the long put position, the commodity seller establishes a higher floor price level because of the premium received for selling the call. However, the cost of this benefit is that the short call position limits the opportunity of higher prices by establishing a ceiling price level. Effectively, the commodity seller using this strategy **"establishes a selling price range."** The selling price range is determined by the strike prices and therefore can be adjusted (widened or narrowed) by choosing alternative strike prices. Next to the short futures position, this strategy provides the most protection against falling prices, as noted in the comparison chart.

Do Nothing
Doing nothing to manage price risk is the most simplistic strategy for a commodity seller—but also *the most dangerous* should the market decline. Doing nothing will yield the best selling price as the market rallies but **"provides zero price risk management"** against a falling market, as indicated in the comparison chart.

Other Strategies for Selling Commodities

There are many other strategies available to a commodity seller. These strategies may involve futures, options or cash market positions and each will have their own set of advantages and disadvantages. As stated earlier in this chapter, a commodity seller should be acquainted with all of their alternatives and understand when a specific strategy should be employed or revised. Remember, a strategy that worked effectively for one commodity sale may not be the best for your next commodity sale.

The first four strategies discussed are usually used in advance of the actual sale of commodities. The next strategy (#5) can be used after the sale of the commodity.

Strategy #5: Sell Cash Crop and Buy Calls

Benefit from a Price Increase

Another strategy that can be used by a commodity seller is to buy a call option after you sell the cash commodity. This strategy would enhance your effective selling price if the market rallies after the cash market sale has been completed.

If you're like most farmers, you've probably asked yourself on more than one occasion this question:

"Should I sell my crop now or store and hope prices go up by spring?"

If you sell at harvest you receive immediate cash for your crop—money that can be used to pay off loans or reduce interest expenses. It also eliminates the physical risk of storing crops, and ensures you won't get into a situation where an increase in price still doesn't cover storage expenses. Therefore, one of the primary comparisons to consider when deciding to store grain or purchase a call option is the cost of storage versus the cost (premium paid) of the call.

But, on the other side, it is always hard to sit back and watch prices rise during the winter months and not be able to take advantage of them.

Rather than make the choice, some farmers will sell their crops at harvest then turn around

and purchase call options. That way, they have immediate cash at harvest but can still take advantage of a possible market rally.

Let's assume you are a corn producer. It is now October and the March futures price is quoted at $2.30 a bushel. At the time, the March $2.30 corn call option is trading at 10 cents per bushel.

Action
You sell your corn at harvest. After reviewing the premiums for the various call options, you decide to buy one at-the-money March call option for every 5,000 bushels of corn you sell at the elevator.

Results
If prices decline, your maximum cost, no matter how steep the futures price decline, will be 10 cents per bushel—the premium paid for the call.

If the March futures price increases anytime before expiration, you can sell back the call for its current premium, and your net profit is the difference between the premium you paid for buying the March call and the premium received for selling (offsetting) the March call.

Depending upon the March futures price, the table below shows your profit or loss if you had bought a March $2.30 call at a premium of 10 cents. Assume there is no remaining time value left in the option.

If March corn futures price in February is:	Long call net gain or loss
$2.00	.10 loss
$2.10	.10 loss
$2.20	.10 loss
$2.30	.10 loss
$2.40	0
$2.50	.10 gain
$2.60	.20 gain
$2.70	.30 gain

One of the greatest benefits of this strategy is the flexibility it provides to producers. They don't have to feel locked in to a given harvest price or take on additional storage costs with no guarantee that prices are going up and their grain won't suffer some physical damage. Of course, there is a price for this flexibility—the option premium. And option premiums will vary, depending on what option strike price you buy. Your options are open.

QUIZ

Quiz 13

1. Assume it is now November, that the July corn futures price is $2.70, and that call options with various strike prices are currently being traded at the following premiums:

Call option strike price	Call option premium
$2.50	$.23
$2.60	$.19
$2.70	$.15
$2.80	$.09

Based on the futures price at expiration and the call you have purchased, determine the net profit or loss.

If futures price at expiration is:	Net profit or loss at expiration if you bought			
	$2.50 call	**$2.60 call**	**$2.70 call**	**$2.80 call**
$2.50	_____	_____	_____	_____
$2.80	_____	_____	_____	_____
$3.10	_____	_____	_____	_____

2. Based on your answers to Question 1, which option offers the greatest profit potential?

(a) July $2.50 call
(b) July $2.60 call
(c) July $2.70 call
(d) July $2.80 call

3. Based on your answers to Question 1, which option involves the largest possible loss?

(a) July $2.50 call
(b) July $2.60 call
(c) July $2.70 call
(d) July $2.80 call

4. Assume at harvest you sold your corn at $2.60 per bushel and purchased a $2.80 July call option for 9 cents. What will be the effective selling price if: (*Hint:* Assume it is close to option expiration so there is no remaining time value.)

Futures price is:	Effective sale price:
$2.50	$_____per bu
$2.80	$_____per bu
$3.10	$_____per bu

See the answer guide at the back of this book.

Flexibility and Diversity
The strategies described up to now have hopefully served two purposes: to illustrate the diversity of ways in which agricultural options can be used and to increase your "comfort level" with the arithmetic of options. By no means, however, have we included—or attempted to include—all of the possible strategies.

Neither have we fully discussed the "ongoing flexibility" enjoyed by buyers and sellers of options. The existence of a continuous market means that options initially bought can be quickly sold, and options initially sold can be quickly liquidated by an offsetting purchase. This provides the opportunity to rapidly respond to changing circumstances or objectives.

For example, let's say you paid 1.4 cents per pound for an at-the-money soybean oil put option with a strike price of 23 cents and, after several months, the underlying futures price declines to 18 cents. The put is now trading for 6 cents. By selling back the option at this price, you can ensure yourself a net return on the option of 4.6 cents. ($.06 premium received – $.014 premium paid). This could be an attractive strategy if, at 18 cents, you feel the price decline has run its course and prices are likely to rise. Once the futures price rises above 23 cents the put no longer holds any intrinsic value.

Options in Combination with Other Positions
As you fine-tune your understanding of options, you may well discover potentially worthwhile ways to use puts and calls in combination with hedging or forward contracting, either simultaneously or at different times.

For instance, assume a local elevator offers what you consider an especially attractive price for delivery of your crop at harvest. You sign the forward contract, but you're a little uneasy about the delivery clause. If you are unable to make complete delivery of the agreed upon amount, the elevator charges a penalty for the undelivered bushels. To protect yourself, you buy enough call options to cover your delivery requirements. Then, if you are unable to make complete delivery on the forward contract due to reduced yields and if the calls increased in value, you could offset some or all of your penalty charges.

For example, suppose a producer has entered into a forward contract to deliver 10,000 bushels of corn at $2.20 in November. December futures are currently trading at $2.40. He simultaneously buys two December $2.60 corn calls (out of the money) at 10 cents per bushel. A floor price for the crop has been established at $2.10 ($2.20 forward contract – $.10 premium paid).

Suppose it was a long, dry, hot summer, and production fell short of expectations. If these fundamentals caused futures prices to go beyond $2.70, (i.e., the strike price plus the $.10 paid for the option), the farmer could sell back the calls at a profit. The producer could then use this money to offset some of the penalty charges he might incur if he doesn't meet the delivery requirements of the forward contract.

Speculative Strategies
Other participants in the marketplace—traders and speculators—help to provide a liquid market that enables options to be quickly bought and sold. They hope to profit by correctly anticipating the direction and timing of price changes.

For example, let's say a trader anticipates rising wheat prices and buys a futures contract at $3.20 per bushel. The futures price subsequently climbs to $3.50, giving the trader a "paper profit" of 30 cents per bushel. On the one hand, the trader does not want to give up the opportunity to realize an even larger profit if the price continues to move sharply higher but, on the other hand, is reluctant to risk losing the paper profit already achieved if the price should turn downward. The solution could be to leave the long futures

position intact (to profit from further increases) and buy a $3.50 put (for insurance against a price decline).

If the cost of the $3.50 put is 8 cents per bushel, buying the put has the effect of "locking in" 22 cents of the 30-cent unrealized gain. Should prices continue upward to $3.80, for example, the net profit is 52 cents ($.60 futures gain—$.08 premium paid).

Conversely, suppose the trader sold the futures contract when the futures price was $3.30 and the futures price subsequently declined to $2.80. One alternative, of course, is to liquidate the futures position and pocket the 50-cent profit. A better alternative might be to leave the futures position intact and buy a call with a $2.80 strike price. If the trader pays 10 cents for the call, this locks in 40 cents of the unrealized profit in the short futures position.

Ways to Speculate on Volatile Prices or on Stable Prices

Just as it is possible to speculate on rising prices with a known and limited risk by buying calls (the most one can lose is the option premium), or to speculate on declining prices by buying puts, experienced option traders can use strategies that offer an opportunity for profit if the underlying futures price changes substantially in either direction. Briefly, here is how they work:

If one expects prices during the months ahead to be highly volatile but is uncertain about the most probable direction of the price change, a trader might consider purchasing both a put and a call with the same strike price and expiration month. This strategy is called **buying a straddle.** The trader will realize a net profit at expiration if the futures price is either above or below the strike price by an amount greater than the total of the premiums paid for the two options. The maximum risk is the cost of the options.

Example: Expecting volatile corn prices over the next three months, one simultaneously buys a $3.00 put at a premium of 15 cents per bushel and a $3.00 call at a premium of 15 cents per bushel—total premium cost: 30 cents. If the futures price at expiration is below $2.70 or above $3.30, the position realizes a net profit. At any price within this range—other than exactly $3.00—a portion (but not all) of the 30-cent premium cost will be recovered by offsetting the in-the-money option and allowing the out-of-the-money option to expire worthless.

Another strategy—known as **selling a straddle**—offers a way to profit from relatively stable prices. It involves selling (writing) both a put and a call with the same strike price and expiration month. There are two break-even points associated with this strategy. The lower break-even point equals the common strike price less the net credit. The upper break-even point equals the common strike price plus the net credit. The maximum profit potential equals the net credit received. (It should be pointed out, however, that this strategy involves a number of risks and should be considered only by those traders who thoroughly understand these risks.)

Example: Assume one earns a 15-cent premium by writing a $3.20 call and an additional 15-cent premium by writing a $3.20 put for a total of 30 cents. If the futures price at expiration is between $2.90 and $3.50, the position will realize a net profit.

For instance, if the futures price at expiration is $3.10, the call buyer will allow the option to expire worthless and the writer will retain the 15-cent premium. However, the put writer will net a 5-cent gain as the put buyer offsets the option to recapture 10 cents of intrinsic value plus any remaining time value. ($.15 gain on call + $.05 gain on put = $.20 net profit.)

Transaction Costs

Trading futures and options involves various transaction costs, such as brokerage commissions and possible interest charges related to margin money. The strategies in this book do not include transaction fees. However, in reality, these costs should be included when evaluating futures and options strategies as they will effectively lower the commodity selling price or increase the commodity buying price. Check with your commodity broker for more information on commodity transaction costs.

Tax Treatment

With all futures and options strategies, you may want to check with your tax accountant regarding reporting requirements. The tax treatment may vary depending on the type of strategy implemented, the amount of time you hold the position, and whether the position is considered a hedge or speculative strategy.

In Conclusion

If you feel you have a working understanding of the material covered in this course—or even a major portion of it—consider yourself far better informed than all but a small percentage of your competitors. And, with the ever-increasing emphasis on marketing skills, it is an advantage that can open the door to new profit opportunities. This does not mean, however, that you should rush immediately to the phone to begin placing orders to buy or sell futures or options.

Review and, from time to time, review again—the portions of this course having to do with market nomenclature and mechanics. Eventually, it will become second nature to you to calculate the possible outcomes of any given strategy and to compare that strategy with alternative marketing/pricing strategies.

Establish a relationship with a broker who is knowledgeable about agricultural futures, options, and price risk management. A broker can answer questions you will inevitably have, keep you posted on new developments, and alert you to specific opportunities that may be worth your consideration.

Seek additional information. Whenever available, send for copies of booklets and other publications on options from such sources as futures exchanges, brokerage firms, and extension-marketing specialists. Watch for opportunities to attend worthwhile seminars on futures and options.

Granted, honing your options skills will require an investment of time and effort, but there is a good chance it may be one of the best investments you will ever make. Besides, by completing this Hedger's Self-Study Guide, you have already begun to make an investment!

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Glossary

at-the-money option—An option whose strike price is equal—or approximately equal—to the current market price of the underlying futures contract.

basis—The difference between the local cash price of a commodity and the price of a related futures contract, i.e., cash price - futures price = basis.

bearish—A market view that anticipates lower prices.

break-even point—The futures price at which a given option strategy is neither profitable nor unprofitable. For call options, it is the strike price plus the premium. For put options, it is the strike price minus the premium.

bullish—A market view that anticipates higher prices.

call option—An option that gives the option buyer the right to purchase (go "long") the underlying futures contract at the strike price on or before the expiration date.

CBOT—Chicago Board of Trade.

CFTC—Commodity Futures Trading Commission.

closing transaction—See liquidation.

commission—Fees paid to the broker for execution of an order.

exercise—The action taken by the holder of a call if he wishes to purchase the underlying futures contract or by the holder of a put if he wishes to sell the underlying futures contract.

exercise price—Same as the strike price.

expiration date—The last date on which the option may be exercised. Although options expire on a specified date during the month prior to the named month, an option on a November futures contract is referred to as a November option, since its exercise would lead to the creation of a November futures position.

expire—When option rights are no longer valid after the option's expiration date.

extrinsic value—Same as time value.

futures contract—A contract traded on a futures exchange for the delivery of a specified commodity at a future time. The contract specifies the item to be delivered and the terms and conditions of delivery.

futures price—The price of a futures contract determined by open competition between buyers and sellers on the trading floor of a commodity exchange or through the exchange's electronic trading platform.

hedge—The buying or selling of futures contracts and/or options contracts for protection against the possibility of a price change in the physical commodity.

holder—Same as option buyer.

in-the-money option—An option that has intrinsic value, i.e., when a call strike price is below the current underlying futures price or when a put strike price is above the current underlying futures price.

intrinsic value—The dollar amount that would be realized if the option were to be exercised immediately. See in-the-money option.

liquidation—A purchase or sale that offsets an existing position. This may be done by selling a futures or option that was previously purchased or by buying back a futures or option that was previously sold.

long—A position established by purchasing a futures contract or an options contract (either a call or a put).

long hedge—Buying a futures contract(s) and/or using an option contract(s) to protect the price of a commodity one is planning to buy.

margin—In commodities, an amount of money deposited to ensure fulfillment of a futures contract at a future date. Option buyers do not post margin, since their risk is limited to the option premium, which is paid in cash when the option is purchased. Option sellers are required to post margin.

margin call—A requirement made by a brokerage firm to a market participant to deposit additional funds into one's margin account to bring it up to the required level. The reason for additional funds can be the result of a losing market position or an increase in the exchange margin requirement.

offset—Taking a futures or option position equal and opposite to the initial or opening position of an identical futures or option contract, "close out."

opening transaction—A purchase or sale that establishes a new position.

open interest—Total number of futures or options (puts and calls) contracts outstanding on a given commodity.

option buyer—The purchaser of either a call option or a put option; also known as the option holder. Option buyers receive the right, but not the obligation, to enter a futures market position.

option seller—The seller of a call or put option; also known as the option writer or grantor. An option seller receives the premium and is subject to a potential market obligation if the option buyer chooses to exercise the option rights.

out-of-the-money option—A put or call option that currently has zero intrinsic value. That is, a call whose strike price is above the current futures price or a put whose strike price is below the current futures price.

premium—The price of a particular option contract determined by trading between buyers and sellers. The premium is the maximum amount of potential loss for an option buyer and the maximum amount of potential gain for an option seller.

put option—An option that gives the option buyer the right to sell (go "short") the underlying futures contract at the strike price on or before the expiration date.

serial option—Short-term option contracts that trade for approximately 60 days and expire during those months in which there is not a standard option contract expiring. These options are listed for trading only on the nearby futures contract, unlike standard options, which can be listed for nearby and deferred contract months.

short—The position created by the sale of a futures contract or option (either a call or a put).

short hedge—Selling a futures contract(s) and/or using options to protect the price of a commodity one is planning to sell.

speculator—A market participant who buys and sells futures and/or options in hopes of making a profit—adding liquidity to the market.

standard option—Traditional option contracts trading in those months which are the same as the underlying futures contract. Standard option contracts can be listed for nearby and deferred contract months.

strike price—The price at which the holder of a call (put) may choose to exercise his right to purchase (sell) the underlying futures contract.

time value—The amount by which an option's premium exceeds the option's intrinsic value. If an option has zero intrinsic value, its premium is entirely time value.

transaction cost—Fees charged by brokers including exchange fees to buy or sell futures and options contracts.

underlying futures contract—The specific futures contract that may be bought or sold by the exercise of an option.

writer—See option seller.

Answer Guide

Quiz 1—page 4

1. (b) Futures contracts are standardized as to quantity, quality, delivery time and place. Price is the only variable. In contrast, the terms of a forward contract are privately negotiated.

2. (a) All futures prices are discovered through competition between buyers and sellers of a given commodity. Neither the exchange nor the Clearing Organization participates in the process of price discovery.

3. (e) The Clearing Service Provider performs both of these functions. The Clearing Service Provider ensures the integrity of futures and options contracts traded at the Chicago Board of Trade and clears every trade made at the CBOT.

4. (b) At the end of each trading session, the Clearing Service Provider determines net gains or losses for each member firm, and each member firm does the same with its customers' accounts.

5. (e) Speculators perform all of these functions.

6. (a) A true hedge involves holding opposite positions in the cash and futures markets. The other positions are merely forms of speculation, since they cannot offset losses in one market with gains in another.

7. (d) Futures margins act as performance bonds that provide proof of an individual's financial integrity and one's ability to withstand a loss in the event of an unfavorable price change. They do not involve credit or down payments, as securities margins do.

8. (f) Being long in a falling market (b) or short in a rising market (c) would result in a loss and, therefore, could lead to a margin call. Because situations (a) and (d) are both profitable, there would not be a margin call.

9. (c) Customer margin requirements are set by each brokerage firm, while clearing margin requirements for clearing member firms are set by the Clearing Service Provider. Neither the Federal Reserve Board nor the Commodity Futures Trading Commission is involved with setting margins.

10. (a) A customer can withdraw gains as soon as they are credited to the account, provided they are not required to cover losses on other futures positions. Accounts are settled after the markets close, so funds are usually available by the start of the next business day.

Quiz 2—page 11

1. (c) Cash prices and futures prices generally move upward and downward together but not necessarily by identical amounts. Even so, the changes are usually close enough to make hedging possible by taking opposite positions in the cash and futures markets.

2. (a) Protection against rising prices is accomplished by taking a long futures position—i.e., by purchasing futures contracts. Protection against declining prices can be achieved by selling futures contracts.

3. (a) The farmer is in the same position, in terms of market exposure, as someone who has purchased and is storing the crop; benefitting if prices increase and losing if prices decrease.

4. (c) The basis is the amount by which the local cash price is below (or above) a particular futures price. The difference between futures prices for different delivery months is known as the carrying charge or the spread.

5. (d) Credit yourself a bonus point if your sharp eye caught this tricky question. The question asks what buying price you can lock in by selling a futures contract. Buying prices are locked in by buying futures contracts.

6. (c) The approximate selling price you can lock in by selling a futures contract is the price of the futures contract you sold minus the local basis, 15 under ($2.50 - $.15).

7. (a) Transportation costs due to location differences are one of the components of the basis; thus higher transportation costs would, all else remaining the same, weaken the basis.

8. (d) An unhedged long cash market position is a speculative position—you will realize a gain if prices increase or a loss if prices decrease.

9. (b) When the basis is relatively weak. For example, assume you initially hedged by purchasing a wheat futures contract at $3.50. If, down the road, prices rise and your supplier is quoting you $4.00 and the futures price is $3.80 (a basis of $.20 over), your net purchase price when you lift the hedge is **$3.70** ($4.00 supplier's cash price - $.30 gain on futures).

On the other hand, let's say futures prices still increased to $3.80 but your supplier is quoting you $3.90 (a weaker basis of $.10 over). Under this scenario your net purchase price is only **$3.60** ($3.90 supplier's cash price - $.30 gain on futures).

10. (a) If you could predict the basis exactly, you would know exactly what net price a given hedge would produce. To the extent basis is subject to fluctuation, there is a "basis risk."

11. (a) Provided you like the quoted price for soybean oil, it would make "sense" to hedge your price risk by purchasing soybean oil futures. According to your basis records, the quoted February basis of 5 cents over is historically strong. Since you would benefit from a weakening basis you could take advantage of today's futures prices by hedging, wait for the basis to weaken, then offset your futures position by selling soybean oil futures and simultaneously purchase soybean oil from one of your suppliers.

12. (b) $3.50 futures price + $.12 expected basis = $3.62 expected purchase price

Of course, if the basis is stronger than 12 cents over, your actual purchase price will be higher than expected. And, if the basis is weaker than 12 cents over, your actual purchase price will be lower than expected. The important point to remember is hedging with futures allows you to "lock in" a price level, but you are still subject to a change in basis.

Quiz 3—page 16

1.

May futures price	Net purchase price	Explanation
$2.58	$2.70	$2.58 futures price - .05 basis $2.53 cash purchase price + .17 futures loss (buy $2.75 - sell $2.58) $2.70 net purchase price
$2.84	$2.70	$2.84 futures price - .05 basis $2.79 cash purchase price - .09 futures gain (buy $2.75 - sell $2.84) $2.70 net purchase price
$2.92	$2.70	$2.92 futures price -.05 basis $2.87 cash purchase price -.17 futures gain (buy $2.75 - sell $2.92) $2.70 net purchase price

2. In April, the price of corn from your supplier is $2.87 ($2.80 futures + $.07 basis). The gain on the futures position is 5 cents per bushel ($2.80 sold futures - $2.75 bought futures), which is used to lower the net purchase price to $2.82 ($2.87 cash price - $.05 futures gain).

Quiz 4—page 20

1.

Cash market	**Futures market**	**Basis**
Jul		
Elevator price for soybeans delivered in Oct at $6.30/bu	Sell soybean futures at $6.55/bu	-.25

Futures price	**Expected basis**	**Expected selling price**
$6.55/bu	-$.20/bu	$6.35/bu

2.

Cash market	**Futures market**	**Basis**
Jul		
Elevator price for soybeans delivered in Oct at $6.30/bu	Sell soybean futures at $6.55/bu	-.25
Oct		
Elevator price for soybeans at $5.90/bu	Buy soybean futures at $6.10/bu	-.20
result:	$.45 gain	+.05 change

elevator sale price	$5.90/bu
gain on futures position	+$.45/bu
net sales price	$6.35/bu

If you had not hedged, you would have received only $5.90 per bushel for your crop versus $6.35. By hedging, you were protected from the drop in prices but also gained 5 cents from an improvement in the basis.

Quiz 5—page 26

1. 50 cents	**2.** 0	**3.** 50 cents	**4.** 0
5. 0	**6.** 40 cents	**7.** 25 cents	**8.** 0

Quiz 6—page 29

1. 5 cents	**2.** 0	**3.** 0	**4.** 10 cents
5. 8 cents	**6.** at	**7.** more	**8.** increases

Quiz 7—page 33

1. (d) The buyer of an option can exercise the option, sell the option to someone else, or allow the option to expire.

2. (b) Upon exercise, the seller of a call acquires a short futures position.

3. (a) Only the seller of an option is required to deposit and maintain funds in a margin account. The option buyer has no such requirement.

4. (b) Option premiums are arrived at through competition between buyers and sellers on the trading floor of the exchange or through the exchange's electronic order-entry system.

5. (c) An option's premium is the total of its intrinsic value (if any) plus its time value (if any).

6. (a) An option's value is influenced most by time and volatility.

7. (a) With the soybean futures price at $6.25, a $6.00 call selling for 27 cents would have an intrinsic value of 25 cents and a time value of 2 cents.

8. (c) If the futures price at expiration is $5.50, a call conveying the right to purchase the futures contract at $6.00 would be worthless.

9. (a) The most that any option buyer can lose is the premium paid for the option. Your maximum loss would thus be 10 cents per bushel.

10. (c) Your potential loss is unlimited because you must honor the call option if it is exercised.

11. (b) With the underlying futures price at $6.50, a call with a strike price of $6.00 would be in the money by 50 cents.

Quiz 8—page 41

1.

January futures price	Net price	Explanation
$6.20	$6.53	$6.20 futures price
		+ .20 basis
		+ .13 premium
		- .00 intrinsic value at expiration
		$6.53 net purchase price
$6.80	$6.73	$6.80 futures price
		+ .20 basis
		+ .13 premium
		- .40 intrinsic value at offset
		$6.73 net purchase price
$7.40	$6.73	$7.40 futures price
		+ .20 basis
		+ .13 premium
		-1.00 intrinsic value at offset
		$6.73 net purchase price

2.

March futures price	Net price	Explanation
$2.80	$2.28	$2.80 futures price
		- .10 basis
		+ .08 premium
		- .50 intrinsic value at offset
		$2.28 net purchase price
$2.60	$2.28	$2.60 futures price
		- .10 basis
		+ .08 premium
		- .30 intrinsic value at offset
		$2.28 net purchase price
$2.20	$2.18	$2.20 futures price
		- .10 basis
		+ .08 premium
		+ .00 intrinsic value at expiration
		$2.18 net purchase price

Quiz 9—page 43

1. There is no ceiling price. By selling a put option you are protected only to the level of premium received.

Floor price = put strike +/- basis - premium

$.235/lb = $.25 - $.005 - $.01

2. Short put gain/loss = futures price - put strike price + premium received

(maximum gain = premium received)

Futures price is:	Put gain/loss	
$.22	$.02 loss	$.22 - $.25 + $.01
$.23	$.01 loss	$.23 - $.25 + $.01
$.24	$.00	$.24 - $.25 + $.01
$.25	$.01 gain	futures price equals put strike price, so you keep entire premium
$.26	$.01 gain	futures price is higher than put strike price, so you keep entire premium
$.27	$.01 gain	futures price is higher than put strike price, so you keep entire premium

3. Purchase price was lower than expected because the basis weakened to 1 cent under October.

Futures price is:	-	Actual basis	=	Cash price	+/-	$.25 Put gain(+)/loss(-)	=	Effective purchase price
$.22	-	$.01	=	$.21	+	$.02 (L)	=	$.23
$.23	-	$.01	=	$.22	+	$.01 (L)	=	$.23
$.24	-	$.01	=	$.23		$.00	=	$.23
$.25	-	$.01	=	$.24	-	$.01 (G)	=	$.23
$.26	-	$.01	=	$.25	-	$.01 (G)	=	$.24
$.27	-	$.01	=	$.26	-	$.01 (G)	=	$.25

Quiz 10—page 45

1. The soybean buyer is anticipating a local basis of 20 cents over the March futures price. Given this information, you can calculate the ceiling and floor prices.

$5.80 floor price =
$5.50 put strike price + $.15 call premium - $.05 put premium + $.20 expected basis

$6.30 ceiling price
$6.00 call strike price + $.15 call premium - $.05 put premium + $.20 expected basis

2. Long call gain/loss = futures price - call strike price - premium cost; maximum loss = premium paid

Futures price is:	Call gain/loss	
$5.00	$.15 loss	futures price is lower than call strike price, so the call has no value; the out-of pocket cost was the 15-cent premium
$5.50	$.15 loss	futures price is lower than call strike price, so the call has no value; the out-of pocket cost was the 15-cent premium
$6.00	$.15 loss	futures price is at the call strike price, so the call has no value; the out-of pocket cost was the 15-cent premium
$6.50	$.35 gain	futures price is greater than call strike price, so the call has intrinsic value; the out-of pocket cost was the 15-cent premium
$7.00	$.85 gain	$7.00 - $6.00 - $.15 premium

3. Short put gain/loss = futures price - put strike price + premium received; maximum gain = premium received

Futures price is:	Put gain/loss	
$5.00	$.45 loss	$5.00 - $5.50 + $.05
$5.50	$.05 gain	futures price equals put strike price, so you keep entire premium
$6.00	$.05 gain	futures price is higher than put strike price, so you keep entire premium
$6.50	$.05 gain	futures price is higher than put strike price, so you keep entire premium
$7.00	$.05 gain	futures price is higher than put strike price, so you keep entire premium

4. Since the actual basis was 20 cents over March, as expected, the purchase price range fell within $5.80 to $6.30 regardless of the futures price.

March futures price is:	+	Actual basis	=	Cash price	+/-	$6.00 Call gain(+)/loss(-)	+/-	$5.50 Put gain(+)/loss(-)	=	Effective purchase price
$5.00	+	$.20	=	$5.20	+	$.15(L)	+	$.45(L)	=	$5.80
$5.50	+	$.20	=	$5.70	+	$.15(L)	-	$.05(G)	=	$5.80
$6.00	+	$.20	=	$6.20	+	$.15(L)	-	$.05(G)	=	$6.30
$6.50	+	$.20	=	$6.70	-	$.35(G)	-	$.05(G)	=	$6.30
$7.00	+	$.20	=	$7.20	-	$.85(G)	-	$.05(G)	=	$6.30

Quiz 11—page 52

1.

November futures price	Net return	Explanation
$5.80	$5.95	$5.80 futures price - .25 basis - .30 premium + .70 intrinsic value of option $5.95 net return
$6.60	$6.05	$6.60 futures price - .25 basis - .30 premium + .00 intrinsic value of option $6.05 net return
$8.30	$7.75	$8.30 futures price - .25 basis - .30 premium + .00 intrinsic value of option $7.75 net return

2.

September futures price	Net return	Explanation
$2.40	$2.52	$2.40 futures price - .10 basis - .08 premium + .30 intrinsic value of option $2.52 net return
$2.70	$2.52	$2.70 futures price - .10 basis - .08 premium + .00 intrinsic value of option $2.52 net return
$3.00	$2.82	$3.00 futures price - .10 basis - .08 premium + .00 intrinsic value of option $2.82 net return

Quiz 12—page 55

1. As explained in Strategy #5, the soybean producer is anticipating a harvest basis of 25 cents under the November futures price. Given this information, you can calculate the floor and ceiling prices.

Put strike price - put premium + call premium +/- expected basis = floor price
$6.00 - $.11 + $.12 - $.25 = $5.76

Call strike price - put premium + call premium +/- expected basis = ceiling price
$7.00 - $.11 + $.12 - $.25 = $6.76

2. Long put gain/loss = put strike price - futures price - premium paid
Note: maximum loss = premium paid

Futures price is:	**Put gain/loss**	
$5.25	$.64 gain	$6.00 - $5.25 - $.11
$5.50	$.39 gain	$6.00 - $5.50 - $.11
$6.75	$.11 loss	futures price equals the put strike price, so the put has no value; the out-of-pocket expense was the 11-cent premium
$7.00	$.11 loss	futures price is higher than put strike price, so the put has no value
$7.25	$.11 loss	futures price is higher than put strike price, so the put has no value

3. Short call gain/loss = call strike price - futures price + premium received
Note: maximum gain = premium received

Futures price is:	**Call gain/loss**	
$5.25	$.12 gain	futures price is lower than call strike price, so the call has no value; you keep the entire premium
$5.50	$.12 gain	futures price is lower than call strike price, so the call has no value; you keep the entire premium
$6.75	$.12 gain	futures price is lower than call strike price, so the call has no value; you keep the entire premium
$7.00	$.12 gain	futures price equals the call strike price, so the call has no value; you keep the entire premium
$7.25	$.13 loss	$7.00 - $7.25 + $.12

4. Since the actual basis was 30 cents under November, 5 cents weaker than expected, the sale price range was 5 cents lower on both ends.

Futures price is:	-	Actual basis	=	Cash price	+/-	$6.00 Pall gain(+)/loss(-)	+/-	$7.00 Call gain(+)/loss(-)	=	Effective sale price
$5.25	-	$.30	=	$4.95	+	$.64(G)	+	$.12(G)	=	$5.71
$5.50	-	$.30	=	$5.20	+	$.39(G)	+	$.12(G)	=	$5.71
$6.75	-	$.30	=	$6.45	-	$.11(L)	+	$.12(G)	=	$6.46
$7.00	-	$.30	=	$6.70	-	$.11(L)	+	$.12(G)	=	$6.71
$7.25	-	$.30	=	$6.95	-	$.11(L)	-	$.13(L)	=	$6.71

Quiz 13—page 59

1.

	Net profit or loss at expiration if you bought			
If futures price at expiration is:	$2.50 call	$2.60 call	$2.70 call	$2.80 call
$2.50 or below	loss $.23	loss $.19	loss $.15	loss $.09
$2.80	gain $.07	gain $.01	loss $.05	loss $.09
$3.10	gain $.37	gain $.31	gain $.25	gain $.21

The profit or loss is the option's intrinsic value (if any) at expiration less the premium paid for the option. Thus, if the futures price at expiration is $3.10, the call with a $2.50 strike price would have a net profit of 37 cents.

$.60 intrinsic value at expiration
- $.23 premium
$.37 net profit

2. (a) If prices increase, the call with the lowest strike price will yield the largest profit. This is why individuals who are bullish about the price outlook may choose to buy an in-the-money call.

3. (a) Since the maximum risk in buying an option is limited to the option premium, the call with the highest premium involves the greatest risk.

4. Since the actual selling price was established at harvest, you would just add the gain or loss on the call to the harvest selling price.

Futures price is:	Harvest sale price	+/-	$2.80 call gain(+)/loss(-)	=	Effective sale price
$2.50	$2.60	-	$.09 (L)	=	$2.51
$2.80	$2.60	-	$.09 (L)	=	$2.51
$3.10	$2.60	+	$.21 (G)	=	$2.81

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