CHAPTER 2

CASH-FUTURES BASIS: THE CONCEPT, USES, ISSUES

The difference between cash and futures prices, defined as basis, was introduced in Chapter 1. It is an important concept. As discussed in Chapter 1, the effectiveness of hedging efforts depends on the behavior of the basis. Basis has other and very important dimensions and applications, however.

Changes in the cash-futures basis can signal developments in the underlying supply–demand fundamentals. Basis thus becomes a barometer of market strength or weakness. The level of the basis is an important part of a decision process in determining whether storage of grain, cotton, or other storable commodities will be profitable. And as was noted briefly in Chapter 1, it is the level of the basis relative to the cost of delivery that becomes important in the delivery process as actions are taken by producers holding short hedges or market arbitrageurs to ensure cash-futures convergence. The level of basis will also determine the type and level of arbitrage activities employed by traders to force convergence in a cash-settled futures instrument. Basis is clearly an important concept, and it deserves more coverage.

CALCULATING AND RECORDING

Information on basis patterns for a particular market area is very valuable. On any specific day, there are potentially as many measures of basis for a particular cash market as there are futures contracts. On November 1, for example, the cash price for corn in a particular market area can be aligned with the December, March, May, July, and September corn futures contracts, all the futures contracts traded for corn. We will deal with the question of which futures contract to use later in the chapter. It is sufficient here to stick with technique. Table 2.1 shows a format that is useful in recording basis.

A time calendar in months runs down the left side of the table. Across the top are the various futures contract months. In each cell is the mean and the range (shown in

TABLE 2.1
Suggested Format for Recording of Cash-Futures Basis for Corn

Calendar Months	Futures Months				
	Mar.	May	July	Sept.	Dec.
January					
February					
April	The mean and range of the basis can be shown for each				
May	combination of calendar months and futures months in $ per bushel.				
June					
July					
August					
September					
October					–$.21 (–.36 to –.16)
November					
December					

parentheses) of the *observed* basis for corn across the past five years.[1] If you want to know the history of the basis in October using the December futures, we can see that it has averaged –$.21 with a range of –$.36 to –$.16 across the five-year period. You need to make sure you understand how these numbers are generated.

The entries in the cell where the calendar month of October intersects with the December futures column come from subtracting the average close of December corn futures during October from the average cash price during October. The calculations might be as implied in Table 2.2. For each of the five Octobers across a five-year period, the average close of the December futures during October would be subtracted from the average cash price for the October months. October is used in the example because it is the normal month in which corn is harvested. The December futures are used since there are no corn futures contracts for October and November and the December futures are the correct choice to be used in hedging a growing corn crop. ***You should take care to note it is cash prices in October of past years versus trading levels of December futures during October in those past years that are used to build the basis history.*** The worst-case basis of –$.36, recorded in Table 2.1, apparently occurred in year 5. Note this was the year in Table 2.2 when the average cash price was $2.60 and the average close for the December futures during October was $2.96.

The same procedure would be followed for each of the other calendar months to complete a large table of basis data. Clearly, the same thing could be done weekly by using weekly average cash prices and a weekly average of the close in December corn futures or some other futures contract of interest. Weekly data would provide more detail and are seen by many users, especially large farmers, to be worth the extra effort. Keep in mind that the product is bought and sold on a daily basis and the weekly or even daily data will provide better estimates of the basis to be expected than would monthly averages. Whether any increase in accuracy is worth the added effort would be for each user to decide, but with electronic spreadsheets on your computer

[1]The five-year period is selected for illustrative purposes. In practice, the user wants as much data as possible, but should not go back to early years when the basis patterns may have changed due to changing transportation costs, new storage facilities having been built, etc. Five years may be a reasonable choice in many settings.

TABLE 2.2
Procedure for Calculating a Cash-Futures Basis for Corn*

		Futures Prices (Basis)				
Year (Month)	Cash Price	Mar.	May	July	Sept.	Dec.
1 (Jan.)	2.41	2.65 (–.24)	2.72 (–.29)	2.75 (–.34)	2.60 (–.19)	2.50 (–.09)
1 (Feb.)	2.49	2.81 (–.32)	2.90 (–.41)	2.95 (–.46)	2.82 (–.33)	2.75 (–.26)
.						
.						
.						
5 (Oct.)	2.60	2.87 (–.27)	2.90 (–.30)	2.88 (–.28)	2.91 (–.31)	2.96 (–.36)
5 (Nov.)	2.02	2.47 (–.45)	2.50 (–.54)	2.60 (–.58)	2.47 (–.45)	2.40 (–.44)
5 (Dec.)	2.10	2.54 (–.41)	2.65 (–.55)	2.68 (–.58)	2.55 (–.45)	2.40 (–.30)

*All data are in dollars per bushel.

or the opportunity to subscribe to an advisory service that maintains these data sets, it is not difficult.

When it is absolutely necessary to go back and create a historical data set, some time savers are possible. Take a cash quote in the middle of the week, Wednesday for example, and record it. Match that cash quote against the close of the futures contract for a particular futures contract for the same Wednesday.

For example, assume the cash quote on Wednesday, October 4, is $3.10. Align that price with the closing price for December futures on October 4, say $3.45. A basis of –$.35 would then be allocated for week 1 in October for this particular year. Do that for all four weeks in the month and then average the results. You get a useful approximation of the basis pattern across recent years with far less number crunching involved. By scanning the calculations, the best and worst basis can be quickly identified. Recall again that the wide basis, the negative basis that is largest in absolute value, is the worst-case basis. The term "weak" is typically used to describe these basis levels that are negative and large in absolute terms. The producer would always prefer a small negative or even a positive basis, available primarily in deficit-producing areas, because that means a better selling price for the cash corn relative to the futures prices. Such a basis with cash price at or above futures is a "strong" basis.

Information on historical basis patterns is often available from the state extension service. The local grain elevator will have some information, and some commodity brokers keep a record of basis levels for several commodities in market areas involving their clients. Historical data on futures prices are available from the exchanges or from private-sector vendors who sell computerized data sets. At the worst, the decision maker may face the task of going to the library and working in the microfilm or microfiche areas. Procedurally, find a cash quote from the local newspaper for a day in the middle of the week and match that against the closing prices for the futures contracts of interest for the same day. Futures prices are always available on microfilm or other recordings of the *Wall Street Journal*. Once the information is gathered, many decision makers use a computerized spreadsheet program (such as Microsoft Excel) to do the calculations, generate the basis tables, and keep them updated. The computerized versions also allow interyear comparisons and plots across different years

that show any difference in the basis patterns. Such comparisons are valuable and electronic aides make them practical.

The discussion to this point implies interest in the historical pattern in the cash futures basis for corn at harvest in October. ***As development proceeds, it will be apparent to you that the basis pattern of interest will be a function of the pricing need and the decision situation involved.*** A hog producer with hogs scheduled to sell in late May will be interested in the cash hog prices in late May against June hog futures across recent years. There is no futures contract for hogs for the month of May. A wheat producer interested in using basis levels to guide a yes–no decision on storage, a decision to be made in late June, will want information on late June cash prices matched against late June levels of the following May (or March, possibly) futures. For a storage program, you will see that this is an ***opening basis***, the basis when you start or "open" the storage program. The producer will also want information on the expected ***closing basis*** late in the storage period as May 1 approaches. Exactly which basis will be needed will become clear as the various decision situations are presented and illustrated. The way the data are collected and recorded does not vary across commodities and across applications, however.

As illustrated in Chapter 1, it is the estimate of cash futures basis that is used to localize the futures price and to determine the forward price being offered by the futures market. During a particular decision period, once a particular basis level is pulled from historical data, it will not change. This is important, because it gives the producer a means of evaluating the cash-contract bids by the local elevator for later delivery.

To illustrate, assume a corn producer has found that the average cash futures basis for October, in the local market area, has averaged –$.30 per bushel across the past five years with a worst-case basis of –$.42. During July, rainfall starts to boost crop prospects and there are reasons to be concerned that prices will be lower at harvest. The producer calls the local elevator and learns the elevator is offering $2.60 for October delivery. ***Is this a good offer, a competitive offer?***

At the time, the producer notes the December corn futures are trading at $3.00. The cash-contract offer for harvest delivery from the local elevator is reflecting a basis level of –$.40 ($3.00 futures versus the $2.60 cash offer), and the producer is concerned.[2] The –$.40 is $. 10 per bushel wider than the average the basis tables show and is within $.02 of the worst-case basis. Recognizing that he or she will be exposed to basis risk, the producer may well decide to hedge the corn at an expected forward

[2]Elevators tie their offers for cash-forward contracts to the futures market by including a margin that will be reflected in the basis. If a producer accepts the $2.60 cash offer, the elevator will immediately hedge its position by selling or going short in the futures market to protect against the risk of prices dropping below $2.60. The important point here is for the reader to recognize the value of basis tables in evaluating the cash bid. *If* the cash bid is reflecting a worst-case basis, *then* the producer might decide it is better to hedge directly in the futures rather than paying the elevator to handle the hedge. Keep in mind that the elevator is facing basis risk and is paying the costs of the futures trades in the cash contract offer. We will come back to this issue in later chapters. The key point here is that most producers who are familiar with trading futures will not be willing to accept a cash contract that allows the elevator to pass all or most of the basis risk to the producer in the form of a low cash bid. Over time, as producers learn to look at the alternatives, the competitive environment in the community improves and the cash bids by the local elevators may start to look better relative to the forward price being offered directly by the futures. If there is competition, the elevator may have to get more efficient or accept a smaller margin.

price of $2.70 ($3.00 futures plus –$.30 average basis) directly in the futures versus accepting the cash-contract offer. After all, the producer reasons, the elevator will hedge the cash-contract positions in the futures—and the producer is not willing to pay as much as $.10 per bushel for the elevator to do the hedging.

A key point here: *Once the producer chooses to use the average basis, the –$.30, it will not change all year.* Some other producer in the same cash market area might choose to use a more conservative estimate of basis—say –$.35—but once that choice is made, there is no reason to change it during the particular growing season. Remember, it is based on historical data. The basis tables will not change until they are updated at the end of the year.

Knowledge of basis levels thus gives you as a decision maker an alternative to cash-contract offers and a means of evaluating these offers. When the cash-contract bid does not look competitive, the corn or other product can be hedged directly in the futures. *Without good basis records and data, these types of informed comparisons would not be possible.*

Basis information is very important. It is worth the effort required to gather historical information on basis, record it, and keep it updated for the five or more most recent years. Basis patterns will be shown to be important for pricing actions for growing crops, for livestock programs, for evaluating prices being offered in cash contracts for later delivery, and for storage decisions for the storable commodities.

LEVEL OF BASIS

Many people equate basis with transportation costs, but it is more complicated than that. It is true, however, that costs of moving the grain or the livestock is a very important component of basis. Corn is worth more at a barge point along the Mississippi than it is 50 miles from the waterway. Slaughter hogs that are being produced near the packing plant are worth more to the plant than they would be if they are a three-hour truck haul away. Transportation costs have increased over time and basis levels have adjusted to reflect those increases. Let's recognize that location and the related transportation costs are key determinants of basis level and look at some other forces that will cause the basis to be weak (more negative) or strong (less negative or even positive).

Forces that cause basis to be weak include the following:

Good weather at harvest

Big crops in competing countries

Big surplus stocks

Inadequate storage capacity on farms

Light participation in the government's price support programs

Shortage of rail cars or barges

The fact that producers need cash immediately

What we find is that anything that forces the producer to sell the cash crop immediately will tend to generate a weak basis at harvest. Good harvest-period

weather brings the crop to market in a rush, and strains the capacity of the storage and transportation facilities. The elevator with little or no storage space is not an aggressive buyer. Cash bids decline, and the basis tends to become more negative. Often, the "forced" sales are a local condition and the futures market does not trade lower with the cash market.

Big crops and big stocks put the buyer in the driver's seat. The processors of soybeans, for example, do not need to bid up cash prices because they know there is an abundant supply of product available. There is little or no incentive to bid up cash prices to get control of the physical product to hold in inventory, and the cash price can drift lower relative to futures prices. The threat of delivery by producers and others holding short positions in futures will eventually constrain basis levels, but there is a great deal of latitude left within that process. Almost any set of basis data for a particular market area and time period will have a range of $.10 to $.20 per bushel for corn across five years and an even wider range for soybeans and possibly wheat.

Problems of inadequate storage, a short supply of rail cars, and so forth, will allow the cash market in a particular market area to drop relative to the futures. In the Southeast, for example, there has been an increase in soft red wheat production in recent years. But there is little on-farm storage, and most of the commercial space is dedicated to corn and soybeans. This means the wheat producer in South Carolina, for example, may be able to buy commercial elevator space in Charleston elevators from harvest in June to some time in late summer. As September approaches, the elevator is going to pressure producers to sell wheat to make room for corn. The necessity of selling in a cash market that recognizes it is something of a distress sale puts pressure on *regional* cash prices. The futures market in Chicago will not necessarily dip to lower prices with the South Carolina cash market. The result is a weaker basis in South Carolina because of limited storage capacity.

Producers who historically were not in the government program are denied access to the loan price[3] as a source of cash flow and may have to dump their product on a harvest-period market that really does not need the grain. Cash prices tended to be forced down relative to futures, especially in states where a smaller percentage of the crop base was in the government program. Again, the local or regional basis is weaker due to lower local or regional cash prices. The forces influencing the cash price will not exert the same level of influence on the more nearly national futures price, and the local basis becomes weaker.

If producers need cash to pay off loans or meet other financial obligations, the cash product may be sold regardless of what the market signals are suggesting in terms of storage. Once again, cash prices can be forced lower in states or regions that were not heavily involved in the government programs and had no other means of meeting immediate cash flow needs.

The opposite of the foregoing cases will, of course, tend to make the basis stronger. If farmers have on-farm storage or can rent commercial space at favorable rates, they can delay sales until the harvest-period pressure subsides. If the corn or

[3]The "loan price" was set in farm bill legislation prior to 1996 and was the dollar value per bushel the producer can get at harvest by entering the grain in government storage programs. If prices go up later, the producer paid nominal costs of storage and reclaimed the grain for sale in the cash market. If cash prices never went up enough to justify reclaim, the grain was "forfeited" and the producer kept the cash from the initial program entry. With the 1996 farm legislation, the chances are much smaller that this type of program will be influencing basis patterns in future years.

wheat is eligible for a government loan program, then cash flow needs can be met by entering the product in the government loan program. The crop can be sold in subsequent months or forfeited to the government after the harvest-period pressure on price has diminished.

A small crop or small and tight stocks in a particular area will always help the basis. In deficit-producing areas, processors will want to control the local supplies if the crop is small, and they may bid up local cash prices to attract the producer's interest in selling. A moment's reflection will suggest that an adequate supply of rail cars to reach distant, especially export, markets and financially sound producers precludes having to dump product on a local market that cannot handle it or does not want it. Local cash prices are supported accordingly, and the basis does not weaken significantly.

Before closing this discussion, it should be noted that changing interest rates have affected long-term basis patterns. It costs more to hold $8.00 soybeans when the interest rate is 12 percent rather than 6 percent. A buyer, facing high interest costs on an inventory of cash product, will bid less for the soybeans. But interest rates seldom change enough within a year to threaten the effective use of basis patterns for decision-making purposes.

Location and related transportation costs are the primary reasons for basis levels in a particular market area. But there are other factors like storage capacity, the level of participation in government programs, weather at harvest, and the financial position of producers that will influence the level of the cash-futures basis at a particular point in time in a particular market area.

BASIS AS A BAROMETER

The futures market discovers price for the national market and considers the overall set of supply-demand information. Within this broad framework, the cash prices—and therefore the basis—can be influenced by market forces that generate information on what is going on behind the scenes. *The astute decision maker will benefit from monitoring basis patterns.*

Consider a grain exporting firm that seeks to buy grain, move it into the world market, and meet a targeted per-bushel profit margin. In such a "pass through" operation, the firm derives a bid to corn producers by subtracting an operating margin (including the targeted per-bushel profit) from bids it is receiving in the world market. If the firm needs 25,000 bushels of grain to complete a unit train load of wheat headed toward the New Orleans export point, the firm's cash bids will often be raised to encourage local producers to sell their grain. Bidding up the last 25,000 bushels of grain may be preferable to tolerating interest costs on the entire train of grain for several days. The firm accepts a smaller operating margin than it might like to see, especially on the last 25,000 bushels, and the cash-futures basis improves.

Observing that change in the cash-futures basis can tell the astute producer something about export market activity and the overall level of demand in the marketplace. If the basis is improving because export buyers are raising cash bids to pry the grain loose from producers and country elevators, the producer feels better about holding the grain in storage. This is especially true if the producer is speculating on the possibility of stronger cash prices. The grain is held with an increasing confidence that cash prices will rally. Improving demand in the cash markets and

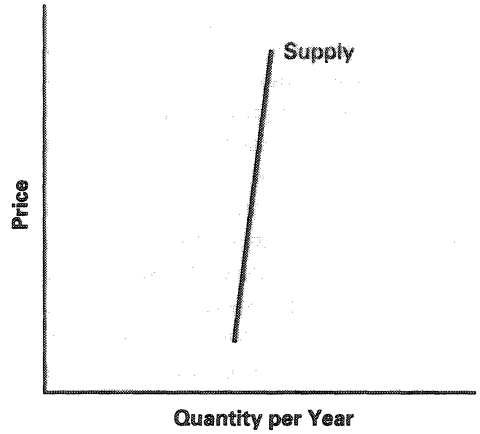

FIGURE 2.1
The Nature of the Supply Function for Grain for the Entire Year

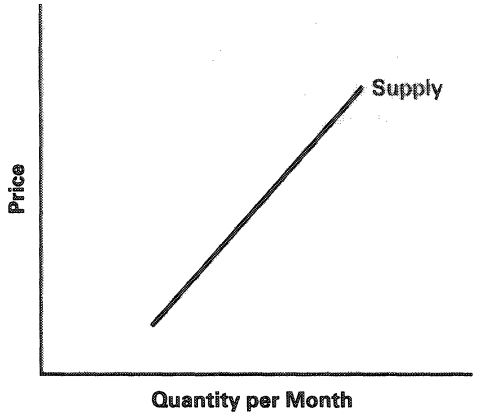

FIGURE 2.2
The Nature of the Supply Function for Grain for One Month

improving basis levels will also tend to boost the futures market. Trading levels of distant futures might move up enough to allow the producer to now forward-price the stored product at a profit even though profitable hedges were not being offered earlier. Basis developments relative to expectations based on historical data and historical basis patterns can become important input to many types of decisions.

The economics of what is happening are demonstrated in Figures 2.1 and 2.2. For the year, once harvest is complete, the supply curve is essentially vertical (Figure 2. 1). The supply curve is therefore very inelastic, which means it has little slope and suggests producers can offer little or no quantity response to a change in price.[4]

In Figure 2.2, the supply curve for a time period as short as one month *does* have some slope, and producers can change the quantity available to the market in response to a price change. Within the year, producers can and will pull grain out of storage and offer it to the export or domestic markets. As the price goes up, more

[4]The quantity available to the U.S. is not totally fixed for the year, of course, if we recognize that we are now involved in a world market. By exporting and importing product, any one country in the world market can change quantity in response to a price change.

product is sold. This selling is the response to the higher cash price. The improved basis that may result also becomes a barometer of what is going on in the marketplace and helps the producer make the decision of whether to sell and when to sell.

Basis patterns can be revealing in livestock as well. Increasingly, meatpackers are trying to schedule cattle or hogs into their plants to avoid costly variability in raw material supplies and operating levels. One way to do this is to offer producers a *basis contract,* a written contract that specifies delivery date(s), quality specifications, and a particular cash-futures differential or a basis level. If the packer is not able to get sufficient supplies scheduled for some future week, one way to attract more hogs or cattle is to improve the basis level in the contract offer. *That change in basis sends a signal to producers about the likely supply of hogs or cattle in the area and the attitude of the packer concerning future supplies.* Improved basis offers suggest the packer is concerned about the adequacy of supply for the future time period and this is very valuable information to the producer who is making decisions on exactly when to sell.

Changes in basis can be a barometer of the level of demand, or supply, in the cash market. An astute decision maker can often infer what is taking place in the market by watching the behavior of the basis. An improving basis means cash bids are moving up relative to futures, and there is always a reason for those improved cash prices.

USES OF BASIS PATTERNS

The question raised in Chapter 1 and earlier in this chapter concerning which futures month will be used for decision purposes is immediately answered when we look at direct uses of the basis. Here, we will look at hedging during a production season and then look at hedging a product held in inventory, the so-called storage hedge. As implied earlier, you will find that the basis data relevant to these two important decisions will be different.

For wheat to be harvested in June, the producer of a growing crop will want to have information on the cash futures basis using the *July* futures. For corn to be harvested in October, the harvest period, cash-futures basis levels using the *December* futures will be of interest. In soybeans to be harvested in October or early November, it will be the *November* futures that will be relevant. *It is always the futures contract that is at or beyond the end of the harvest period that will be used.* You should recall that futures are not traded for every month and review Appendix 1B in Chapter 1.

Let's use corn to illustrate. From early in the year, even before the crop is planted, the producer can monitor the December futures to see what forward price the futures market is offering. Recall the forward price is defined as:

$$FP = FUT + BASIS$$

Where

FP = forward price,

FUT = price for the futures contract to be used, and

BASIS = the expected basis for the period when the crop will be harvested and sold in the cash market.

It is the *harvest-period basis,* using the December futures, that will be used to adjust or localize the quote coming from the Chicago Board of Trade. In early May, the producer might be interested in the cash-futures basis using the May futures as a barometer of the market for corn still being held in storage, but that is *not* the basis needed to estimate and monitor forward-pricing opportunities for the growing crop. For the growing crop, the basis tied to the December futures will be of concern.

So, in early May, producers would come down the left column in Table 2.1 until they reach October (if harvest will be in October) and then go across to the column tagged with December futures. For the rest of the year, since the basis tables are based on historical information, whatever basis level is picked for use in that local market will continue to be used.[5]

The same approach is taken if the enterprise being hedged is cattle or if we are dealing with an agricultural bank in its attempts to gain protection against higher interest rates. *You always pick the futures month beyond the end of the cash program or decision period.* As a rule of thumb, you should not use November soybeans, for example, unless you are reasonably sure the soybeans will be harvested by November 15. During the last few days of trading before the November futures contract matures on the next to last Thursday of the month, basis performance can be quite variable. If there is good reason to expect harvest will be delayed until late November or early December, the producer should move out to the January futures (the next futures month) and hedge the soybeans using the January futures.

For a production hedge, use the futures month just past the projected end of the harvest. That futures contract will be used in calculating historical basis data. The normal contracts are November futures for soybeans, December for corn, October or December for cotton, July for winter wheat, and December for spring wheat.

The storage hedge is different. Here, we will be especially interested in the basis pattern for the end of the storage period, the *closing basis* for the program. In this decision situation, the basis at the beginning of the potential storage period, the *opening basis,* is also important in estimating or projecting the probable basis improvement and the related *profit* potential to the storage program. Thus, there is interest in the opening basis and the closing basis. The opening basis is the current cash price versus the current price for the distant futures at the beginning of the storage period. The closing basis is the cash price versus futures price for that same distant futures at the end of the storage period.

Consider the case in which storage of corn is being considered, with the storage period to run from October 1 to May 1. Table 2.3 records the framework needed to make the storage decision intelligently, and profitably, over time and demonstrates the very important storage hedge.

[5]As suggested earlier, not all decision makers will use the average basis. Some will lean toward the worst-case basis across recent years to be conservative. That way, the chances are smaller that the closing basis in the fall will be worse than the one used to estimate the forward price. Using the worst-case basis thus tends to ensure that any basis surprises that will occur at harvest will be favorable rather than unfavorable. If this is not clear, review the hedging illustrations in Chapter 1 that show a final basis not equal to the expected basis used when the hedge was initially planned and established. Table 1.3 provides an illustration.

TABLE 2.3
Demonstration of the Use of Basis and Basis Patterns in Making the Hold–Sell or Storage Decision

Date	Cash Prices and Basis	Futures Action
October 1	Cash bids @ $2.40, May futures @ $2.85, opening basis = –$.45	
	Cost of holding October 1 to May 1, including interest on the $2.40 cash corn, estimated @ $.21.	
	Expected closing cash futures basis on May 1 = –$.15	
	Expected profit = expected basis improvement less costs of holding = ($.45 – .15) – .21 = $.09	
October 1		Sell May corn futures @ $2.85.
May 4	Sell cash corn @ $2.50.	Buy back May futures @ $2.65.
	Net = –$.11	Net = $.20
	Overall = $.09	

Costs = 1–2 cents per bushel commissions plus interest on margin funds.

Note that the opening basis on October 1 *using the May futures is* –$.45 per bushel. With a relatively wide basis at harvest, interest in storing should improve as the decision maker looks ahead from an October 1 vantage point. After all, a wide basis at harvest means cash prices are relatively low and there is always resistance to selling at what looks like low prices. *But will storage be profitable?*

The answer comes from comparing the projected basis improvement with the estimated costs of holding the product. Note that in Table 2.3, the closing basis near May 1 (from historical tables) is *expected* to be –$.15. That means an expected basis improvement of $.30 per bushel (–$.45 to –$.15), and the costs of holding the grain are being estimated at $.21. Those costs include interest on the $2.40 corn, aeration, shrinkage, handling, and personal property taxes where applicable. Having considered all these costs, it looks as if storage has a good chance of being profitable.

The various parts of Table 2.3 deserve more emphasis before proceeding. *On October 1, the cash bid on October 1 against the October 1 trading level of the May futures sets the opening basis of –$.45.* No historical tables are needed here, and there are no projections required. The cash bid and the trading level of the May 1 futures are known with certainty on October 1. Producers can simply pick up the phone to check cash bids at local elevators and look in the newspaper, check with a broker, or use the electronic service they subscribe to to get October 1 prices for May futures.

The expected closing basis for May 1, the –$.15, *does* come from the historical tables. Recalling the format for recorded basis data discussed earlier in the chapter, that –$.15 could be the average basis across the past five years, it could be the worst-case basis around May 1 across the past five years, or it could be a level within the range of observed basis levels that the decision maker decides to use. *It is important to remember that the decision maker has to select a particular basis level from the historical tables.* As discussed earlier, using the worst-case or weakest basis would help to ensure that the storage program would not be subjected to a basis around May 1 that is weaker (or more negative) than that used in evaluating profitability of the stor-

age program. But there are still no guarantees. If some combination of cash prices and futures levels on May 4 emerges that gives a basis of –$.24, the hedged storage program breaks even.[6] Any basis on May 4 that is weaker than –$.24 would mean the program actually loses money. You must keep in mind that the individual producer is a price taker in both markets. Producers sell the cash product as high as they can, and buy back the futures position as low as possible—but individual decision makers can exert no influence on either of the two markets.

Before proceeding, it is important to spend time on Table 2.3. Be prepared to work through the final results with varying closing basis levels. Confirm, for example, that before commission and interest costs on margin money, a cash price of $2.70 and a May futures price of $2.75 on May 4 would result in an overall profit of $.19 per bushel, not the projected $.09. Confirm also that a cash price of $2.70 and a May futures price of $2.94 on May 4 would result in an overall profit of zero, not the projected $.09 per bushel.

Another way of dealing with the storage decision is to recognize that storage can be profitable when the projected closing basis allows pricing the corn above the break-even near May 1. Using the information from Table 2.3, the forward price for May 1 is

$$\begin{aligned} FP &= \text{Futures} + \text{Basis} \\ &= \$2.85 - .15 \\ &= \$2.70. \end{aligned}$$

With the corn forward-priced at $2.70, the projected break-even is $2.61 ($2.40 cash bid plus the $.21 costs of storage) and the profit potential is again $.09 per bushel. In other words, *the low cash price at harvest ($2.40) and its related weak basis creates a situation such that the grain can be forward-priced at a profit subject to basis risk.* The same basis improvement present in Table 2.3 generates the opportunity to forward-price above the break-even cost for May 1.[7]

Across the years, producers have built on-farm storage and then feel the storage has to be used. When prices are high at harvest, they store. When prices are low at harvest, they store. The attitude is that, since prices are usually at their lows for the year during harvest, storage should be profitable. But that approach is wrong. *It is basis and projected basis patterns that should be used in making the storage decision.*

[6]With a basis allowance of –$.15 near May 1, the projected profit is $.09 per bushel. If the *actual* closing basis near May 1 is –$.24, the program will only break even *no matter what the general price level turns out to be.* Any cash futures combination near May 1 that results in a basis weaker than –$.24 would result in a loss. Note that a –$.15 basis allowance suggests a profit of $.09, so a basis when the program is terminated that is $.09 "worse" than –$.15 (i.e., –$.24) will result in a break-even position. Anything worse than –$.24 will mean a loss. You should spend some time on this point and recognize there *is some possibility that a new worst-case basis could develop and turn the $.09 per-bushel profit expectation into a loss.*

[7]You should pause and note that costs of production do not enter into the storage decision. On October 1, all production costs are fixed. It is the cash bid of $2.40 on October 1 that is being bypassed (the opportunity cost, in economic terms) and it is the $2.40 that should be used to "cost" the corn into the storage program.

Research shows that holding any storable product as a cash-market speculator seldom works. Cash prices must increase enough to cover all costs, including shrink and, very important, interest on the value of the inventory. If you have to continue or renew a note with a 12 percent interest rate because you do not sell soybeans at $6.00 at harvest, interest costs alone will be $.06 per bushel per month! If no extension of a note is involved, the money could be earning 8–9 percent in a certificate of deposit, and that rate should be charged as the opportunity cost of holding the soybeans.

The point is, the cash market will seldom rally enough to cover all storage costs based on examination of past price patterns in the Midwest (a surplus production area) and also in the Southeast (a deficit production area). The rule therefore really becomes:

> **Hold and store grain or other storable commodities only when projected improvement in basis allows the commodities to be hedged or forward-priced at a profit.**

This fundamental rule for the storage decision explains the often-heard observation that the manager of a grain elevator does not much care about the *level* of the cash market, that the manager only cares about *basis.* Upon reflection, you would agree. *A well-managed grain elevator will always hedge its inventory, so it is in fact basis and basis patterns that are important.* The elevator will always try to buy cash commodities at harvest-period prices low enough to allow the inventory to be hedged at a profit given their extensive knowledge of historical basis patterns.

When the basis is weak at harvest and the projected basis improvement indicates storage will be profitable, the farmer with on-farm storage can do the same thing as the elevator. Having the storage bins gives the opportunity. Insisting on using the bins at all times as a cash market speculator will typically lose money. Remember, the bins are a fixed cost and fixed costs should never influence the hold–sell or storage decision.

Immediately, then, interest switches to how often the basis patterns do in fact say yes to storage. Figure 2.3 plots corn basis, using the May futures, from October 1 through the end of April for three representative years. The cash price used is the central Illinois price for # 2 yellow corn. With the costs of storing the corn from October 1 to May 1 usually in the $.20 to $.35 per bushel range—and it does differ for $3.00 corn versus $2.00 corn because of interest costs—there are years in which storing and forward pricing makes good money.

Year 2, for example, shows a harvest-period basis of about –$.53 and the basis improves to about –$.05 on May 1. The basis improvement was $.48, and there was good money to be made by storing. Conversely, years 1 and 3 offered no better than a breakeven situation. It is interesting to note that these actual basis patterns move to essentially the same level on May 1 even though the opening basis levels in October were significantly different. All the closing basis levels are in a range of –$.02 to –$.10 per bushel.

Figure 2.3 clearly demonstrates the need for a conscious decision on storage. In years (such as year 2) when the harvest-period basis is wide, storage may offer excellent profits. In other years, the best decision is to sell the cash grain at harvest and not insist on using the storage facilities. Across a number of commodities and across areas of the country, examination reveals the same patterns. *In some years, storage offers excellent profits, but in a majority of the cases, the harvest-period basis is saying "sell the cash."* Those basis-related signals are usually correct.

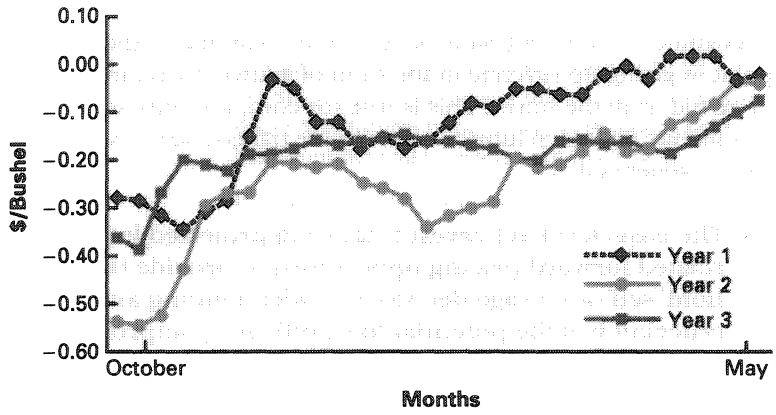

FIGURE 2.3
Basis Patterns for Corn, October to May, for Three Consecutive Years

Returning to the storage rule and restating in terms of the forward-pricing opportunities for emphasis, we can calculate the possible profits to storage as

$$PRO = FP - BE$$

where

PRO = expected profits,
FP = forward price, and
BE = the break-even price (harvest price + storage costs).

The rule then becomes:

Store and forward-price when the forward price offered exceeds the break-even price by a sufficient amount to justify the acceptance of the inherent basis risk.

You should stop and think a bit here about possible management strategies. Look at the basis path in year 2 in Figure 2.3. About all the basis improvement we might have expected based on an average closing basis of –$.05 for the historical data had been realized by mid-December. At that point, the producer should sell the cash product, buy back or offset the short position in May futures, and *terminate the storage program.* The expected basis gain has been realized and the costs of storing the commodity have been cut in half. The program will be much more profitable than anticipated, and you can terminate the program by selling cash and buying back the futures whenever you like. That flexibility is an obvious advantage of storing and forward-pricing in futures versus using a cash contract from the local grain elevator that calls for early May delivery.

The examples clearly show the importance of basis risk. *One reason that cash-forward contracts are so popular is that producers do not want to deal with the basis risk and are willing to pay someone else to handle the basis issues and accept exposure to basis risk for them.* At this point, you should pause and reflect on how much you should be willing to pay for avoiding exposure to basis risk. It will vary across producers, of course, but not many producers would be willing to pay the

equivalent of the worst-case basis in the form of a lower price in cash contract offers. Recognition of that notion is built into the wording of the storage rule. There is no point in giving up revenue in the form of a lower-than-can-be-justified cash contract price bid from the buyer. This is true for corn, for hogs, for cotton, or for any other commodity for which futures contracts are traded and for which historical basis tables can be generated.

The basis level at harvest relative to projected later basis levels, and the related forward-pricing opportunities, provide the keys to profitable hold–sell or storage decisions. Understanding and using this decision criterion has the potential to significantly improve the profit position of producers who have access to storage capacity.

BASIS AS A DECISION CRITERION

It is clear from the foregoing discussion that the actual basis level at harvest is the key to the storage decision. But the basis level is not always wide enough to justify storage. What does the decision maker who wants to benefit from expected higher prices do when the harvest-period basis and the projected basis improvement do not support storage?

There are a number of alternatives, including holding the product as a cash market speculator. But we have already argued that being a cash market speculator seldom works. Fortunately, there are alternatives and most involve using the basis as a guide. If the basis is too narrow at harvest to justify storage, producers can look at (1) a basis contract, (2) delayed pricing contracts, and (3) selling the cash and buying the futures.[8]

Basis Contract

The format of a basis contract is illustrated in Table 2.4. The buyer and seller agree on October 10 on a basis level tied to some distant futures contract—here the May corn futures. A negotiated percentage (usually around 75 percent) of the value of the product at harvest is paid to the producer at the time the contract is signed. The elevator gets the grain immediately. Between harvest and a specified ending date, usually May 1 if the May futures are involved, producers must decide when they are ready to close out the program and establish the price. In the table, it is assumed the producer makes that decision on March 21.

Several important features of the basis contract approach deserve emphasis.

1. *Most storage costs to producers are eliminated.* Here, the producer incurs only the interest cost on 25 percent of the harvest-period value. This is the important feature—price levels do not *have* to rally enough to cover all costs of holding the grain for the program to be profitable. If the producer does not have outstanding debt, interest earned on the $1.50 received at harvest might also be credited to the program.

[8]Later, it will be apparent that buying a call option on futures versus a direct position in futures is a possibility. But the procedure is much the same, and we will illustrate here by dealing directly in the futures. Coverage of option strategies is reserved for Chapter 7.

Date	Prices	Action
October 10	Cash = $2.00	Elevator pays a negotiated 75 percent of $2.00 ($1.50) to producer. Agrees to pay producer $.10 under May futures prior to May 1. Producer signs basis contract and transfers corn to elevator.
		Elevator buys May corn futures.
March 21	May futures = $2.41	Producer asks to "settle" and gets $2.31.
		The elevator sells the May corn futures and pays the producer a net price of $2.31.

TABLE 2.4
Demonstration of a Basis Contract for a Corn Producer and Elevator

2. *The elevator or other buyer gets the grain and the producer loses control.* If the elevator runs into financial trouble, the producer is in trouble.
3. *Basis contracts work to the benefit of buyer and seller when the buyer needs the grain and the seller is expecting prices to move higher.* Remember, the way the buyer shakes the grain loose to fill the train, meet processing needs, and so on, is to bid up the cash market and narrow the basis—and that is when the basis contract works. The buyer wants the grain immediately, and the bidding up of the cash grain and the willingness to negotiate a basis contract suggest to the producer that prices might increase.
4. *Very importantly, the producer is still fully exposed to price risk.* It does little good to have a contract for $.10 under May if you stand and watch the May futures go significantly lower in price. *Producers must monitor and protect themselves against major price breaks.* All the techniques to be developed in later chapters to help pinpoint when to hedge or forward-price will be equally appropriate in determining when to close out the basis contract or when to seek price protection.
5. Table 2.4 does not include specifics on futures prices, but *it is pertinent to note that the elevator is accepting the basis risk.* If the basis is wider than the $.10 allowed in the contract, the elevator incurs the costs. In a rising market, to illustrate, the futures position will not provide full protection to the elevator if the basis widens and is –$.20 or –$.25 when the producer decides to close the pricing component of the contract. The value of cash inventories has declined relative to the futures, and any holder of inventories will want to see the cash-futures basis strengthen.

The basis contract is thus an excellent approach when the harvest-period basis does not suggest storage but there is reason to expect prices to move up. The basis contract eliminates most storage costs, and the producer can benefit from even a small increase in price.

Delayed Pricing Contracts

The deferred or delayed pricing contracts or programs work much like the basis contract except the producer gives up title to the grain and has neither basis nor price set. How much, if anything, the producer gets up front varies. In some cases, it is a matter of getting free storage in a commercial facility for a few weeks or months. In other

instances, the producer may be allowed an extended period to price that delays the actual sale or pricing into another tax year. One approach is to pick a date or pick a time period and the producer receives the going cash market offer on that future day.

Generally, the deferred pricing schemes are not favorable to the producer. Price level could fall and the basis could widen, so both types of risk are present and are being carried by the producer. We could argue it is better than being a cash market speculator because not all costs of storing are present, but that depends on what up-front benefits accrue to the producer. On the negative side, the possession of the grain has transferred to the elevator, and the producer has lost control in the event of financial difficulty by the elevator.

If a basis contract is not available, producers have a third option when the basis is too strong to suggest storage. They can simply sell the cash product and buy futures for a corresponding number of bushels.

Sell Cash, Buy Futures

Selling cash and buying futures essentially captures the benefits of a strong basis. This approach has several attributes that are worthy of consideration.

1. *All costs of storage for the physical product are eliminated* since the producer gets the full harvest-period cash market value when the cash product is sold.
2. *Basis risk is largely eliminated* since the cash position has been closed out while the basis is favorable.
3. *The producer, holding long positions in the futures, is fully exposed to price risk*. If price levels in futures fall, margin calls will be involved and losses will accumulate.
4. The long position in futures is a speculative position in the futures market.[9]

The approach is not necessarily a bad one even recognizing the possible tax implications. *It is often far better than being a cash market speculator where the producer pays all the storage costs for the privilege of speculating in the cash market.* Speculating in futures can be much cheaper, and any small increase in price levels could move the program to the profitable side of the ledger.

Table 2.5 provides a comparison of several alternatives when the basis is unusually strong (small negative or even positive) at harvest and the prices trend higher through the year. Table 2.6 repeats the comparisons when the price trend is down. It is apparent, upon examination of the tables, that virtually any strategy will be superior to holding the product as a cash market speculator.

The tables are important, but the numbers and the results may not be intuitively obvious to you. To make sure all this is clear, let's work through the results shown in Table 2.5.

[9]There is a popular feeling among producers that so long as they do not take a bigger position in futures than was the cash position they just sold, they are somehow "hedging." This is false. Once the cash position is eliminated, there is no way the "equal and opposite" acid test of what is a hedge can be met. Appendix 2A to this chapter summarizes the implications to the tax position of the producer and provides general guides to distinguish a hedge from a speculative position. You are cautioned to remember that these are general guides and are not legal opinions.

October 1	Cash bids = $2.10 per bushel May futures = $2.30 Cost of storage = $.28
April 30	Cash market = $2.30 May futures = $2.40
Strategies:	
Cash speculator	–$.08 net compared to $2.10 sale
Basis contract*	$.17 net compared to $2.10 sale
Sell cash, buy futures**	$.09 net compared to $2.10 sale

TABLE 2.5
Comparison of Alternatives When the Basis Is Strong at Harvest: Price Trend Is Up

*Assumes settlement $.10 under May futures on April 30 and $.03 per bushel interest cost on the 25 percent of value not paid on October 1.

**Assumes commission costs of $.01 per bushel for the round turn in the futures.

The cash speculator holds $2.10 corn and incurs a cumulative cost of storage of $.28. The break-even price is therefore $2.38, but the corn is sold on April 30 at $2.30—the best cash bid available. The program loses $.08 per bushel.

Using a basis contract eliminates all the costs except the interest on the 25 percent of harvest-period value, the $.525 per bushel not paid on October 1. This illustration thus assumes the basis contract called for 75 percent of the October 1 value to be paid on October 1. At 10 percent for 7 months, the interest cost on the $.525 runs $.03 per bushel. The producer receives $2.30 on May 1 if the contract called for $.10 under May, an improvement of $.20 per bushel over the October 1 cash bid of $2.10. Deduct the $.03 interest costs, and the result is a $.17 net improvement over selling on October 1.

In selling cash and buying the futures, all costs are eliminated except the costs of trading futures. A $.01-per-bushel commission cost is used, and no interest on margin funds is included since the futures account is generating revenue in an upward-trending market. Buying futures at $2.30 and selling them at $2.40 grosses $.10 and nets $.09 after commissions compared to selling October 1.

October 1	Cash bids = $2.10 per bushel May futures = $2.30 Cost of storage = $.28
April 30	Cash market = $1.90 May futures = $2.00
Strategies:	
Cash speculator	–$.48 net compared to $2.10 sale
Basis contract*	–$.23 net compared to $2.10 sale
Sell cash, buy futures**	–$.33 net compared to $2.10 sale

TABLE 2.6
Comparison of Alternatives When the Basis Is Strong at Harvest: Price Trend Is Down

*Assumes settlement $.10 under May futures on April 30 and $.03 per bushel interest cost on the 25 percent of value not paid on October 1.

**Assumes commission costs of $.01 per bushel for the round turn in the futures and $.02 per bushel interest cost on added margin-call funds.

Thus, both the basis-contract and the sell-cash-buy-futures strategies are significantly superior to the cash speculative position. The relatively strong basis on October 1 was discouraging holding the cash grain, and this message is typically correct. If the –$.10 closing basis was representative of the historical levels, only $.10 in basis improvement was potentially available from October 1 to April 30. *The market was saying do not store.*

In Table 2.6, the comparisons are similar. Both the basis-contract and the sell-cash-buy-futures approaches lose less than the cash speculative strategy. Relative to selling on October 1, the basis-contract approach would lose $.23 as futures decline to $2.00 and the price settlement is at $1.90. The $.03 interest cost is still present.

Selling the cash and buying futures is $.33 below selling at harvest. When the futures market declines, margin calls will be involved. An added $.02 per bushel cost is incorporated to reflect the interest costs of the increased margin money. The net is therefore the $2.10 cash sale less the $.30 loss in futures less the $.03 combined commission and margin interest costs, or $1.77. That result is $.33 worse than selling at harvest for $2. 10.

Both Table 2.5 and 2.6 reflect modest movements in price. In a year in which the cash price goes up dramatically, the cash speculative strategy would look more favorable. The storage costs are still present, however, and those costs will pull the net from a cash speculative strategy below the other approaches *unless* the cash market goes up significantly relative to the futures as the basis strengthens in a major way. Such basis developments are not highly likely during a storage period.

The regular storage hedge is not shown in Tables 2.5 and 2.6. When the price trend is up (Table 2.5), the storage hedge would lose $.20. The forward price of $2.20, using a –$.10 basis for April 30, is $.18 below the break-even of $2.38 ($2.10 cash bid plus $.28 storage). There would be an added $.02 in costs of the hedge including interest on small margin calls. When the prices go down, the losses would be around –$.19—the –$.18 that was "locked in" plus $.01 commission costs. The futures position would have earned revenue in the down market so no interest cost on margin money is assessed. *Clearly, if there is reason to expect prices to decline during the storage period, any inventories that are being held should be hedged.*

The basis level, and expected movements in the basis, are key components of successful decisions on storage. By taking advantage of knowledge on how to manage basis, the decision maker can employ more effective overall strategies than just being a cash market speculator. When a profitable storage opportunity is not available, other strategies that are related to basis and basis behavior are often superior to being a cash market speculator.

BASIS CONTRACTS IN PRODUCTION PROGRAMS

By offering a basis contract that looks good to a producer, a grain elevator is helping to ensure it will get grain at harvest. Meatpackers who offer basis contracts to cattle feeders or hog producers are after the same thing—they want to ensure a stable flow of quality product into their facilities. In extending a basis contract in an effort to secure the raw material, the buyer is accepting the basis risk.

If there is no pricing provision in the contract, the buyer will not necessarily have a position in futures. The objective is to secure a supply of raw materials. The basis risk is still present. Assume a grain elevator extends a basis contract specifying a price of $.15 under November futures for soybeans at harvest. The contract ensures the producer will deliver soybeans to the elevator, but the elevator is still exposed to basis risk. *If, at harvest, the basis is wider than the level specified in the basis contract, the buyer will pay a net price that is above the going cash market.* A basis of –$.25 versus the contracted –$.15 in soybeans will mean the buyer is $.10 worse off via the basis contract than if he or she had just waited and bought in the cash market. It is apparent that if the basis is more favorable than the contracted level, the buyer will benefit. The same holds true for the buyer of cattle or hogs via basis contracts.[10]

The motivation, once again, is to tie down a supply of raw material and to schedule it into the elevator or into the processing facility. Buyers will want to accomplish that task without giving up too much in terms of exposure to basis risk. Clearly, buyers would prefer to establish basis levels in the contracts that are weaker (more negative or smaller positive) than they expect the final basis to be. Sellers want the strongest possible basis that can be negotiated. Again, we see the importance of producers having complete information on historical basis levels and basis patterns. If the producer does not have historical basis information, the elevator or other buyer is in a superior bargaining position in negotiating the details of the basis contract.

Keep in mind that the buyer is receiving a benefit in the form of guaranteed supplies. If that benefit is significant—and it certainly can be—then the buyer should be willing to pay a premium in the form of accepting basis risk. If, through superior knowledge of basis patterns, the buyer can secure supplies and transfer much or all of the basis risk to the producer, then the buyer has a double advantage. It is *very* important that the cattle feeder, for example, not accept a basis contract of "$1.00 under June" if the historical data set on basis levels in the packer's market area shows –$1.00 per hundredweight to be a worst-case basis and that the more likely basis is +$.50 per hundredweight.

Buyers use basis contracts to acquire product or raw material and stabilize flows into their facilities. In the process, basis risk is often transferred from the producer to the buyer during the production period. If the basis level in the contract is to the disadvantage of the producer given historical patterns, however, the risk is transferred back to the producer. It is important to have good basis information.

SUMMARY

The cash-futures basis is extremely important to the decision maker. Looking at the behavior of cash prices versus the nearby futures can provide an indication of the strength of demand in the cash market. The expected harvest-period basis allows the

[10]If the producer is also offered a pricing feature that is established at the time the contract is signed, as in the typical basis contracts in storage programs, the buyers will need to have a long position in futures. Basis risk is still transferred to the buyer, however

producer to monitor the forward price being offered by the futures market and gives a means of comparison with cash contract offers by the local elevator for harvest-period delivery.

By extending the basis calculations to distant futures, the producer has the foundation for profitable hold–sell or storage decisions. Storable product should be placed in storage when the projected basis improvement exceeds the costs of carrying the product. If the basis is too small at harvest to suggest storage, the product should be sold. If there are sound reasons to expect higher prices, then basis contracts, a deferred pricing plan, or even selling the cash and buying futures will usually outperform a cash speculative program and reduce the decision maker's risk exposure by reducing or eliminating the costs of storing the physical product.

Individual decision makers who do not have access to historical basis patterns should invest the time and effort to get the data. Knowledge of basis levels and basis patterns is extremely valuable in virtually any decision that involves use of futures markets as a price risk management tool.

KEY POINTS

- *The behavior* of the basis, not the *level of the basis,* is the key to the effectiveness of hedging programs.
- The level *and changes in the level* of the basis using the nearby futures can be a barometer of the strength in demand for the cash product and can also give some indication of the supply of product available to the market.
- *Basis patterns* are the key to effective storage decisions. The rule is to *store only when the projected improvement in the basis exceeds the costs of storing the product.*
- The best storage opportunities occur *when the basis is unusually weak (cash significantly below futures) at harvest.*
- When the basis is too strong at harvest to suggest storage, *the use of basis contracts, deferred pricing plans, or even selling the cash product and buying futures will usually be more effective than holding the product as a cash market speculator.*
- *Basis contracts leave the producer fully exposed to price risk,* and the decision maker should be alert to profitable opportunities to close out the basis contract.
- *Delayed pricing contracts typically leave the producer exposed to both price and basis risk* and are generally not effective marketing techniques for the producer.
- *Selling the cash product and buying futures at harvesttime can be an effective approach,* but it will typically be *viewed as a speculative position in futures* for tax purposes.
- *Historical data on basis levels and patterns are extremely valuable* and put the producer in a much better bargaining position with the buyer of grain or livestock. Developing over time a set of historical data and developing measures of the frequency with which various basis levels are observed *puts the individual producer in a more effective bargaining position in dealing with buyers.*

USEFUL REFERENCES

Wayne D. Purcell, *Managing Price Risk in Ag Community Markets,* John Deere Publishing, 1997. Chapter 4 of this reference provides a very basic treatment of cash-futures basis.

David Rinehimer, "Hedging," in Perry J. Kaufman, ed., *Handbook of Futures Markets: Commodity, Financial, Stock Index, and Options,* John Wiley & Sons, New York, 1984. In developing hedging examples, the author deals with basis patterns, the seasonality of basis, and related topics that would add to the coverage in this chapter.

APPENDIX 2A. SPECULATION AND TAX IMPLICATIONS

The tax treatment of trade in commodity futures is important to the user. If trade is ruled to be speculative in nature, deductions for tax purposes are restricted. Individuals may be able to deduct only $3,000 in a particular tax year, and any added losses must be carried forward to future years. Certain corporate entities may not be able to deduct any losses that are ruled to be speculative in nature.

If the activity is ruled to be legitimate hedging activity, then any losses on the futures side of the hedge program are deductible. In a year in which the market moves up significantly in the futures, the futures side of the transaction can show a large negative result. The decision maker is "covered" since the cash market will be moving up too, but it is clearly important that the trades be treated as hedges for tax purposes so that the negative accumulation in the futures account will be effectively deductible and taxes are paid only on the net profit from the hedged program. For a long hedge, of course, it could be a declining market that accumulates a negative balance in the futures account, and the tax implications are the same. It is important that the decision maker have an understanding of what is and what is not hedging.

There are apparently no clear court rulings on what is and what is not hedging, especially for the selective hedging approach popular with many traders. In this appendix, we offer strictly a layman's interpretation of the guidelines that appear to have been used in past court cases. *You are cautioned to keep in mind that these are not legal opinions and should be used accordingly.*

Criteria that appear to be used in the court rulings and in the opinions of the Internal Revenue Service are the following:

1. The trades should meet the "equal and opposite" test. That is, the futures position should be opposite the position in cash and should not be larger than the position in cash. For example, a corn producer who expects to produce 50,000 bushels of corn should not be short more than 50,000 bushels in corn futures. A cattle feeder who will need 20,000 bushels of corn to complete a feeding program is "short" in the cash market, and should not be "long" more than 20,000 bushels of corn in the futures market. This test of equal and opposite positions is typically the first criterion applied by the IRS and by the courts in legal rulings.
2. The futures positions should be designed to protect the user against disadvantageous moves in the cash market. An elevator holding 500,000 bushels of wheat in storage would be hurt if the price levels fall. Therefore, the elevator would be expected to be short in the futures market because that is the position that would protect against a decline in the cash market. If the elevator places long hedges to protect against rising costs of grain to fill an anticipated sale, the futures transactions should be accounted separately for the long hedges.
3. There should not be frequent trades in futures. The IRS and the courts may disallow trades that meet the equal and opposite test and the test of being positioned to protect against disadvantageous moves in the cash market if there are frequent trades. This is often an issue in the selective hedging programs. At the extreme, day trades (in which positions are placed and removed in the same trading day) are sure to raise serious questions about whether the program is a legitimate hedging program. The selective hedging program likely has a better chance of passing the test if the trades are infrequent and are clearly designed to protect

against major moves in the price levels based on some defensible criterion that is being used to signal change in the direction of price trends.

4. The trades in the futures should not have a profit motivation. Any appearance of trade in futures to earn profits and to help support an otherwise unprofitable business program is likely to receive an adverse reaction from the IRS and from the courts.
5. The futures trades should be an integral and important part of the ongoing daily activity of the business. This tends to be an overall criterion that suggests the business is using the futures property, meeting all the other "tests," and would have difficulty operating successfully without the futures activities.

In general, the decision maker can enhance the probability of a positive ruling in terms of what is hedging versus speculation if there is a clear intent to protect against adverse moves in the cash market, if the equal and opposite test is met, and if there is not evidence of frequent trades and a related profit motivation.

You should recognize that at the time of this writing, we are not aware of any court ruling that clearly establishes criteria to determine what is and is not hedging in a selective hedging program. A program that does not show frequent trades and has a documented and demonstrable reason for lifting and replacing hedges is more likely to receive a positive interpretation given the positions being adopted by the Treasury Department in recent years, but there are no ironclad guarantees that even that type of program will not be viewed as speculative in a particular situation and at a particular point in time.