Chapter 9
Futures Trading in Relation to Grain and Livestock Pricing

INTRODUCTION

The principal Illinois farm products—corn, soybeans, cattle, and hogs—are actively traded on futures markets. Futures markets are central to the price formation of these products and to the pricing activities of farmers, whether farmers use them directly or indirectly. Some farmers use futures indirectly by contracting for deferred delivery at firm prices and by delaying pricing past the time of delivery. In such cases, some marketing agent is doing the farmer’s futures trading for him. More broadly, all of the commercial forces that go into the making up of prices are registered in futures markets by the trading done by people engaged in production, marketing, processing, and distribution. Their actions in cash commodities result in actions in futures, and these futures actions determine futures prices. Thus, indirectly, the actions of farmers are registered in futures, and actions in futures affect farmers’ production and marketing decisions. Futures markets are thus central to farmers’ pricing activities.

Some general comments about futures markets may be in order as background to their use.

1. Some of the trading is done by commercials whose trades are related to actions in cash commodities, and some trading is done by speculators. The proportion by each group varies by commodity, but the share done by commercials is fairly high, generally more than half.

2. The positions taken by commercials are partly dependent on their cash commodity positions and partly dependent on what they expect to happen to prices in the future. When they take cash positions they offset them either in futures or by not depending on their price expectation.

3. Speculators take positions in futures as they expect prices to go up or down. They look to the future, form expectations, and take positions. They make money when they are right and lose money when they are wrong. They influence prices up as they expect prices to go up, and vice versa.

4. Futures prices eventually go to the value of the cash commodity. The lines of causation are from supply-demand determined cash commodity value to futures prices. The anticipated values can wander as the actions and expectations of commercials and speculators change, but they will finally come home to roost on value in use.

5. Futures prices are about the future. The future is uncertain, therefore futures prices are speculative. They are formed in a crucible of actions and counter-actions of traders who contemplate the future, form judgements, and put money at risk. Through this process markets offer farmers opportunities they can accept or reject as their own speculative judgements and financial positions tell them.

6. Cross sections studies of the kinds of people who trade in futures indicate that the largest occupational group of speculators in agricultural commodities is farmers. This is not farmers who use futures in direct connection with their farm business but farmers who speculate. There is nothing the matter with speculation as such, but it is not a part of farm business. A farmer who wants to speculate should do so in a separate account and in no way relate the results to his farming operation.
KINDS OF USES AND WHAT A FARMER NEEDS TO KNOW

Farmers use futures markets directly and indirectly. In direct use they open an account with a commission house and make transactions. In indirect use they make cash contracts at firm prices for later delivery and cash contracts for immediate delivery with price to be fixed later and someone else, usually the firm with which the contract is made, makes an offsetting transaction in futures, that is, does the farmer’s futures trading for him.

In commercial use, such as the case of a farmer, a futures contract is a temporary substitute for an eventual cash transaction. It stands for a time in the place of a cash transaction that would have otherwise been made. Almost without exception, farmers have no reason to make or take delivery and should enter into futures transactions with the expectation that the futures position will be offset at the time that the eventual cash transaction is made.

Farmers can use futures contracts to fix approximate cash price in advance of delivery. For crops such prices can be fixed as early as November-December of the year preceding the year in which crops are grown and applied to physical delivery at the subsequent harvest or delivery at the end of the subsequent storage season. The total possible time line for corn, soybeans, and wheat can be as much as 20 months. For cattle and hogs, the length of the time forward that prices can be approximately fixed is as long as the most distant futures price. This is usually 13 months.

Farmers can use futures contracts to delay fixing approximate selling prices past the time that physical delivery is made, title passed, and money received. Effective ownership is retained by buying futures contracts at the time that the cash commodity is sold and delivered. The farmer can remain in the same long speculative position with futures that he held in grain while it was growing, in hogs while they were being gestated and fed, or cattle while they were on feed. Such a position can be held for the indefinite future.

Farmers can use cash forward contracts to fix selling prices in advance of delivery. Grain elevators typically offer cash forward contracts for harvest delivery as early as January preceding the planting season. Such contracts can be made at any time up to harvest that the farmer elects. Such contracts put the elevator in a long position with risk of loss if prices go down and in a similar position for potential windfall profits if prices go up. To avoid these extremes the elevator either makes a cash forward contract with a merchant or processor or sells futures contracts.

Opportunities to make cash forward contracts at firm prices for cattle and hogs are more limited but are available. A second kind of cash forward contract available to grain framers is for post harvest delivery. Most elevators have bids available for January, March, May, etc., delivery before and during harvest. Such bids reflect a payment for storage from harvest to the delivery time. Again, as farmers make such contracts someone sells futures contracts in an equivalent amount.

Many elevators offer delayed pricing or price later contracts. One kind is the preharvest and harvest delayed price contract. The farmers sell and title passes, but the price is fixed at such later time as the farmer elects. It is an arrangement in lieu of storage such that the farmer can retain effective ownership when storage is not available. A charge is made in place of a charge for storage.

A second kind of delayed price contract is made in the middle to latter part of the storage season. Title passes and the elevator can sell the grain, but the farmer fixes price at a later time. Such contracts are frequently made without storage charge.

In some delayed pricing situations the elevator keeps the grain either in regular or temporary storage and thus incurs no price risk. In other situations the elevator sells and ships. Having sold something not yet bought, the elevator is vulnerable to a rising price. The elevator makes money if the price goes down and loses money if it goes up. To avoid such gains and losses the elevator replaces sold grain by buying futures contracts.

A farmer needs to have only a limited amount of information and knowledge to use futures markets properly. There are two categories: (1) he must open an account with a commission house, know how to place orders, and know his obligations in his customer agreement with the house, particularly regarding margins posted, and (2) he needs to know what given futures price means in terms of the cash price at his usual, local market; that is, he needs to know cash-futures price relationships or basis. Knowing how to use futures is quite simple; it is knowing what to do that is difficult. The implementation of expectations is simple but the formulation of expectations is difficult.
MECHANICS OF FUTURES TRADING

Futures markets have a confusing and mysterious appearance to most people. Because of low margin requirements great leverage is possible, so equity changes—gains and losses can be huge. As a result of low margin and high leverage many, if not most, farmers are reluctant to make direct use of futures markets. This reluctance is unfortunate because: (1) futures markets are often better tools for forward and delayed pricing than other methods, and (2) use of futures markets is quite simple, and risks are inherently no greater than trading in cash commodities. A few basic things should be understood.

A futures contract is an agreement to later buy and sell a commodity at an agreed price. For every buyer there is a seller, hence for every long there is a short. If a farmer sells 5,000 bushels of December corn at $2.50 he has made a contract to deliver 5,000 bushels of no. 2 yellow corn in store in a public warehouse designated as regular for delivery by the Chicago Board of Trade—whatever day in December that he elects to do so. It is a simple contractual agreement using standard contracts traded on a recognized exchange.

Most contracts are made by both buyers and sellers for purposes other than making or taking delivery. Hence, most are offset before they mature. A contract can be offset by an opposite contract. A farmer sells 5,000 bushels of December corn on May 25 for $2.50. On September 9 he decides, for whatever reason, that he no longer wants to be committed to deliver and so buys 5,000 bushels of December corn and pays $2.00. He is now committed to both deliver and take delivery. The contracts are matched and cancelled. He has sold for $2.50 and bought at $2.00 for a $0.50 profit. His account is credited for $2,500, minus a small commission.

Commission houses are members of exchanges and act as agents for non-member traders. The customer signs an agreement with the commission house. The agreement is a limited power of attorney in which the commission house is authorized to execute the orders placed and the customer agrees to abide by the rules of the exchange, maintain margins as required, and be financially responsible for the trades he makes. In addition, the commission house is empowered to refuse orders or make offsetting transactions if the customer is in violation of the agreement. Commission houses are regulated by exchanges and the government. The commission house accepts and executes orders, keeps the accounts, is financially responsible to the exchange for the customers’ transactions, and has a fiduciary responsibility for the customers’ funds that are on deposit.

Registered representatives are employees of commission houses and are the people with whom customers deal. They relay orders to the floor for execution, furnish information, and consult with customers.

There are numerous kinds of orders that customers can place, but four cover most kinds of customer activity. A market order is to be executed immediately at the best possible price: “Buy 5,000 December corn” means “Do it now at the lowest price the pit broker can obtain.” A limited order has a reservation price attached to it: “Buy 5,000 December corn at $2.00” means “Buy it for less if you can but don’t pay over $2.00.” Limited orders must also have a time period attached to them. The customer must specify the length of time, and he may specify any period he wishes. It may be an hour, today only, a week, or indefinitely. “Buy 5,000 December corn at $2.00, open” means “Keep trying until I tell you to quit.” Spread orders are instructions to buy one delivery month and sell another. They may be at the market price, which means do it now at the widest difference possible, or they may be limited to a designated difference. “Buy 5,000 December and sell 5,000 July at 17 cents premium the July” means that the customer doesn’t care what prices he pays so long the difference is 17 cents or more. Again, the time that the order is to remain in effect must be a part of the order. A stop order is contingent on the price reaching some indicated level, and when that level is reached it becomes a market order. Stop orders may be made to offset an existing position or may be used to initiate a position. A customer may be long 5,000 December corn and wish to avoid a loss past a certain point—say $2.00. “Sell 5,000 December at $2.00 stop” means “If the price goes down to $2.00 sell me out at the best price you can get.” It may be filled at $2.00 or less, depending on market conditions. Again, a length of time that the order is good must be indicated.

All orders except market orders can be cancelled at any time the customer elects. Commission houses will accept any order that they can clearly understand. Several kinds of orders can be combined
into one. Suppose the price of December corn is $2.11. An order may read "Buy 5,000 December at $2.10, stop $2.00, sell $2.30, one cancels the other, open." This means "Buy at $2.10 if you can; if you get it bought sell me out if it goes as low as $2.00 or as high as $2.30; these instructions last until I tell you different; if you don't get it bought the sell orders don't become effective; and when one sell order is filled the other is cancelled."

Exchanges require that commission house customers post margins to guarantee performance on contracts and that margins be maintained in the event that the market moves against the position of the customer. A margin is earnest money and remains the property of the customer. Margins are kept in segregated accounts. Initial margins are usually set at 5 to 10 percent of the contract value, and maintenance margins are set at about 75 percent of the initial margin.

The initial margin for a corn contract might be $1,000 or 20 cents per bushel, and the maintenance margin might be $750 or 15 cents. Suppose a customer deposits the minimum margin and sells 5,000 bushels of July corn for $2.30, and the price goes up to $2.34. The four cent loss is $200, and the customer's equity is $800. Because $800 is more than $750 all is well. The price goes up to $2.36. Now the loss is $300 and the equity is $700. Because $700 is less than $750 the customer will be requested to deposit an additional $300.

When equity goes below the maintenance level the margin must be restored to initial margin level. Suppose that the additional $300 is deposited and the price goes down to $2.30. The position value is now zero and the equity is $1,300. The additional $300 may be withdrawn. Suppose it is withdrawn and the price goes down to $2.10. The position value is $1,000 and the equity is $2,000. The customer may withdraw $1,000 and maintain the position.

The first thing we should note is that equity is continually marked to the market. A contract is not worth what it is bought or sold at, but rather it is worth its current value. Gains and losses are continually realized even though the contract remains in force. This is a useful reminder: a thing is not worth what is paid for it but what it can be sold for now.

The second point worthy of note is that futures markets are not high risk media unless they are made so. Suppose a customer deposits $2,000, buys 10,000 July corn at $2.30, and the price goes down to $2.24. He has lost $600, is below main-

tenance margin, and gets a margin call. Suppose he says no, and the house sells his contract for $2.24. The $600 loss and $73 commission is subtracted and $1,327 is returned. He has lost 34 percent of his deposit with a 2.6 percent change in the price. Wow! What kind of a swinging door did he get caught in? However, suppose he deposited the total value of the contracts of $23,000. He would have lost the same $673 or 2.9 percent. This is precisely what happens when a farmer deposits 10,000 bushels of corn in an elevator and the price goes down 6 cents. Futures markets are not inherently high risk media; they can be made high risk by using all of the leverage possible.

**PRICE RELATIONSHIPS OVER TIME**

Knowledge of usual changes in price relationship over time is essential to the effective use of futures markets for storable commodities such as corn and soybeans. Knowledge of changing price relationships in non-storable commodities such as hogs and cattle is not necessary for their effective use.

The price of cash grain gains in relationship to futures price during the storage season, that is, from harvest to the following summer. It goes up more than the futures or down less, as the case may be. This relationship exists because storage of grain is expensive and the holding of futures contracts is not: A storage facility must be provided, grain must be kept in condition, and money is tied up in the grain. A typical elevator charge for corn storage is 12 cents to January 1 and 1 ½ cents per bushel per month thereafter. In such a case, the charge through July is 22½ cents. If money is worth 8 percent and corn worth $2, the interest cost through July is 9.3 cents and the total is 31.8 cents. In contrast, a futures contract doesn't cost anything to store, and not much money is tied up.

If a livestock feeder anticipates needing corn during the following July he can buy cash corn at harvest and incur 31.8 cents additional cost, or he can buy a July futures contract and avoid the 31.8 cents. He is willing to pay approximately 31.8 cents more for a futures contract than he is for the cash corn. If the cash is at a discount greater than 31.8 cents, say 40 cents, he will buy and hold cash. If the discount is less, say 20 cents, he will buy the futures. It follows, then, that at a given time the cash price should be below the
futures price by the cost of holding until the delivery month.

The various futures contracts that apply to a given crop (for the 1979 corn crop the applicable futures were: December 1979, March 1980, May 1980, and July 1980) have different maturities, so there are different costs of storage incurred. Accordingly, each successive delivery month should be above the preceding one by the cost of storage.

Such is the theory of the carrying charge. It tends to be borne out in the real world. Figures 9-1, 9-2, and 9-3 are corn price charts for the 1975, 1976, and 1977 crops, respectively. The cash prices are bids to country elevators in East Central Illinois—bids to farmers were approximately six cents less. Figures 9-4, 9-5 and 9-6 are the corn basis charts for the same respective years. The December futures price was set equal to zero until December first, and the cash and July price were plotted in relation to December. On December 1 the July futures price was located at its then difference to December and set equal to zero. The cash price line is the amount that it was under December until December 1 and then the amount that it was under July until the expiration of the contract. Note that each figure covers a 19-month time span, so there is a seven-month

![Figure 9-1. 1975 Crop Corn: Cash and Futures](image1)

![Figure 9-2. 1976 Crop Corn: Cash and Futures](image2)

![Figure 9-3. 1977 Crop Corn: Cash and Futures](image3)

![Figure 9-4. Corn Basis 1975 Crop: No. 2 YC Country Elev. (ECI) and Chicago Futures](image4)

![Figure 9-5. Corn Basis 1976 Crop: No. 2 YC Country Elev. (ECI) and Chicago Futures](image5)

![Figure 9-6. Corn Basis 1977 Crop: No. 2 YC Country Elev. (ECI) and Chicago Futures](image6)
overlap during which there are two different basis charts applying to two different crops.

From the second three figures we note:

1. The cash price is erratically stable to the future until harvest. There is no storage cost involved in a growing crop. The difference during the growing season is the difference that is expected to prevail at harvest by the people who are bidding for cash corn.

2. The cash gains relative to the futures as the storage season progresses.

3. The July is higher than the December during the time that they are both traded.

4. The cash gains rapidly on the futures during the immediate post harvest period. The bulk of storage costs are incurred by providing space and equipment to put the corn away. The main additional cost for the balance of the season is the interest on money tied up.

5. The basis patterns are erratic; the individual years are quite different. In the long run basis changes are close to holding costs, but in the short run they depend on the supply of and demand for space.

The 1975 and 1976 crops were large, so the price of storage as reflected in the basis was high. In both years the cash price gained rapidly on the futures during the immediate post harvest period. Note that in 1975 the basis widened, and cash got to an extreme discount during harvest. The market did not anticipate and was not prepared for the deluge of corn. In 1976 the harvest pressure was well anticipated and the market was prepared even though the crop was larger. The ending basis in 1977 was unusually wide. Supplies of corn were abundant, and a large increase in carryover was expected.

In 1977 the pre-harvest basis was quite large, reflecting the large carryover of 1976 corn and the expectation of a large crop. Because of the low price level producers were tight holders of corn, and the basis narrowed rapidly from peak harvest into December. When cash prices neared $2.00, sales increased and the basis widened slightly. Further basis narrowing was minimal until April and May. Transportation problems and large ending stocks resulted in a widening basis in June and July.

LIVESTOCK

Because many people are familiar with the carrying charge structure in grain markets they look for a similar pattern in hog and cattle markets. This is a mistake. The carrying charge pattern exists in grain because it must be stored, and storage has a cost. Hogs and cattle can only be stored by feeding them to overweight, which is a process that (1) loses money, and (2) can be done for a limited time only. Because livestock is not stored there is no functional relationship among the various futures contracts. Each maturity is a supply-demand event unto itself.

PRICE RELATIONSHIPS OVER SPACE

The price with which the producer is concerned is the one at the local market at which he sells his grain and livestock. But quoted prices are typically at central market locations, and futures prices apply to the delivery points specified in the futures contracts. While Toledo, Ohio and St. Louis, Missouri are alternate delivery points for corn and wheat, Chicago is the basic delivery point on Chicago futures prices for wheat, corn, and soybeans. Thus, the futures prices represent prices of grain in store at Chicago. There are numerous locations at which hogs and cattle can be delivered. Peoria, Illinois is the par delivery point for hogs, so futures represents grades no. 1 through no. 3 at Peoria. Par delivery for cattle is at Peoria and Joliet, Illinois; Omaha, Nebraska; and Sioux City, Iowa.

The livestock futures markets have a fairly good record of convergence. The average price of hogs at Peoria during the delivery month is never precisely equal to the average of the futures over the same time span. Sometimes the futures average higher than the cash and sometimes lower, so the long-term average difference is essentially zero. The important thing is that at sometime immediately preceding or during the delivery month cash and futures are equal. That point usually occurs on several different days.

The cash price of choice cattle at Omaha averages fairly close to the average of the futures price during the delivery month. Again, they are virtually always equal on numerous days immediately preceding and during the delivery month. What this convergence means is that the individual producer can have confidence that he can buy back futures that he sells at prices equal to the price that he can obtain for his cash hogs and cattle.
if his local cash prices are equal to Peoria and Omaha prices.

Commodity prices differ over space in what is called a spatial equilibrium pattern. The relationships depend on cost of movement. When grain is tributary to a central market its price is below the central market by the cost of transportation. Corn in central Indiana is typically below the Baltimore price by the cost of transportation to Baltimore. Prices at all locations are functionally interrelated by transportation costs.

Unfortunately, the differences between locations are not stable over time. Supplies at the many different points of origin vary between years as do local demands. Requirements at the thousands of locations of use vary both between years and within years. Thus, equilibrium is never achieved. But there are normal values about which the differences fluctuate. Futures prices are central, and the multitude of cash prices fluctuate in relation to them.

THE SIGNIFICANCE OF DIFFERENCES

Understanding and anticipating cash-futures price relationships over time and space is the central consideration in using futures markets and evaluating cash forward and delayed pricing contracts. For merchants who operate on a national scale it is very complex. For producers confined to a small geographic area it is not very complex. Each producer needs to be able to estimate what the cash price will be at his local market in relation to the nearby futures price at the time that he intends to market the commodity. He needs to be able to estimate what the price of hogs will be at this local market in relation to the Peoria price at the time that he intends to sell hogs. He needs to be able to estimate what the price of the kind and quality of cattle that he intends or is feeding will be in relation to the price of choice steers at Omaha at the time he will have cattle ready for market.

The producer needs to be able to estimate what the price of cash corn at his local elevator will be in relation to the December futures price at harvest, in relation to the March futures price during January and February, and in relation to the July futures price during the May-July period. He needs to be able to do the same thing for soybeans.

What all of this amounts to is the ability to translate futures prices for the different times of the year. For hogs and cattle it is simple. The producer looks at the futures price for the month nearest the time that he will have hogs and cattle ready and adjusts it up or down for his local market. For corn and soybeans the estimation of the harvest, the January, the March, and the summer basis is a two step process. The first step to examine the history of local basis for several years and from this examination develop a concept of average or normal basis. The producer then needs to figure out why the basis was particularly wide in some years and particularly narrow in others, just as we did for corn for 1975, 1976, and 1977. In short, the producer needs to be continually aware of basis just as he is aware of price, and he needs to become a student of basis. The more he works at it, the greater his skills will become.

HOW TO USE . . .

The following section is devoted to how to use futures and how to evaluate cash forward and delayed price contracts. Before proceeding we note generalities that you should keep in mind.

To this point we have not mentioned hedging, and because so many people have at least heard of hedging we should do so. In discussing the use of futures in connection with the farm business two words need to be said about hedging: “It isn’t.” Farmers don’t hedge, nor can they. Their problem is to establish selling prices. They can contract forward at firm prices, or they can delay pricing past the completion of production. But they cannot avoid the decision about when to sell. The difference between futures activities of farmers and hedging is that in hedging risks of price level change can be avoided, but farmers cannot avoid the speculative decisions of when to sell. Farmers use futures better when they clearly understand this difference.

Farmers should stay out of delivery months for grain and not take livestock positions very close to the end of trading. Delivery month trading and the expiration of contracts, particularly late in the storage season, sometimes gets hectic and erratic. The technical delivery situation sometimes dominates markets, so price relationships for points away from the delivery point are not normal. In most instances grain merchants start trading on the basis of the next contract month about the tenth of the delivery month.

One of the most difficult problems that farmers face in using futures markets or in forward contracting in cash markets is the amount of flexibility
that they should allow themselves—how many changes of mind can they have, particularly in the event of adversity. What is a good forward sale may turn out to be a bad one as conditions change. Forecasts are not cast in concrete, and marketing plans and commitments should not be either. A sale of December corn at $2.75 was a good plan in early summer of 1977 but became pointless when December went under $2.00 and the loan was raised from $1.75 to $2.00. A sale of new-crop corn in the spring of 1974 was a good idea until the weather degenerated.

Marketing plans should be changed when (1) the plan has gone sour, or (2) goals have been realized. Both adversity and success are basis for change of plan. There cannot be hard and fast rules about when and how often changes of mind are permitted. Three do’s and don’ts stand out. (1) Do base changes in positions on changes in price expectations that are based on changes in supplies or demands or on changed prices. The central question that must be continually asked is: How much do I want to have priced at today’s supply, demand, and price situation? (2) Don’t allow recent price behavior to be of major influence. So called moving hedges based on trend analysis have been popular at times. They have been successful at times and unsuccessful at others. They buy when the price has gone up and sell when it has gone down and lose every time the price reverses itself. A rising price when your forecast says the price should go lower may be the result of an unforeseen force or it may be a market error. (3) Don’t trade in and out of markets. A farmer’s game is judgment of economic value and longer-term price changes. Short-term movements are the game of active speculators, particularly those who give full-time attention to trading and are located at markets. To trade in and out is to play someone else’s game.