3

Merchandising and Inventory Management of Commodities: Carrying Charges and Basis

Raleigh B. Wilson

Several months ago when I was asked to prepare a program related to the cash activity of the grain industry, I accepted, considering it an honor to be asked to make this presentation. As I thought about this program, I felt that I had taken on a real task, but after further thought and consideration, I started thinking about the operations in cash grain and realized that they are so much a matter of daily business routine to those of us involved, that it is a good thing to sit back and try to put into words a presentation that will explain the relation of the terminal elevator operator to the futures market.

Up to this point in the seminar you have been concerned with the mechanics of the activities and operations of the futures market. Now we will introduce the relation of the futures market to cash grain operations, as it relates to carrying charges and cash basis.

In grain merchandising, every terminal and subterminal market throughout the country, as well as the local country elevators, is concerned with carrying charges and basis in its cash grain operations, with location and transportation important factors to be considered.

It should be pointed out that the terminal elevator operator has a place and purpose in the structure of commodity markets. He serves as the warehouseman for crops that move to market in volume during a short period of time once or twice a year, to be resold for consumption during the next twelve months. The producer, with the increase of mechanization on the farm and increased yields due to scientific farming improvements, moves an ever greater volume in a shorter period of time. He sells that portion of his crop which he intends to, obtains payment for his grain, and thus relieves himself of the problems of storage, conditioning, insurance, and financing.

These factors are now passed on to the terminal warehouseman. At the time of purchase the terminal operator has a general idea of his outlets for the grain, when sales can be made, and approximate sales value. It is the desire of the terminal operator to be able to buy and accumulate his inventory at a price in relation to the futures that will compensate him for his expense of carrying the grain as well as the drying, cleaning, and turning that might be necessary to keep his inventory in condition. It is therefore obvious that the elevator operator must have an effective means of minimizing his risk from wide price fluctuations, and obtain carrying charges and merchandising margins for the length of time he has the grain in his elevator.

In the most simple illustration, it is shown how grain is bought and hedged in the current future, and then resold and the current hedge lifted. This does occur on a certain portion of the elevator volume that is handled on a "turn over" operation. When grain is purchased, the first problem of the elevator operator is to decide where hedges will be placed against inventory accumulation. There are available to the warehouseman four of five future delivery months for hedging purposes. It becomes a matter of market judgment where to place the hedge. So at this point the elevator operator has to look at the "carrying charge" presented to him by the various delivery months and decide if the difference shown is as wide as can be expected, or whether it is best to hedge in the current future, and wait for a more opportune time to move his hedge to a deferred future.

Before taking up carrying charges in detail, I would like to present an illustration of price relationship of corn in an attempt to show you how the "basis," that is the premium or discount of grain relative to a futures contract at a given point, is determined. (See Figure 1).

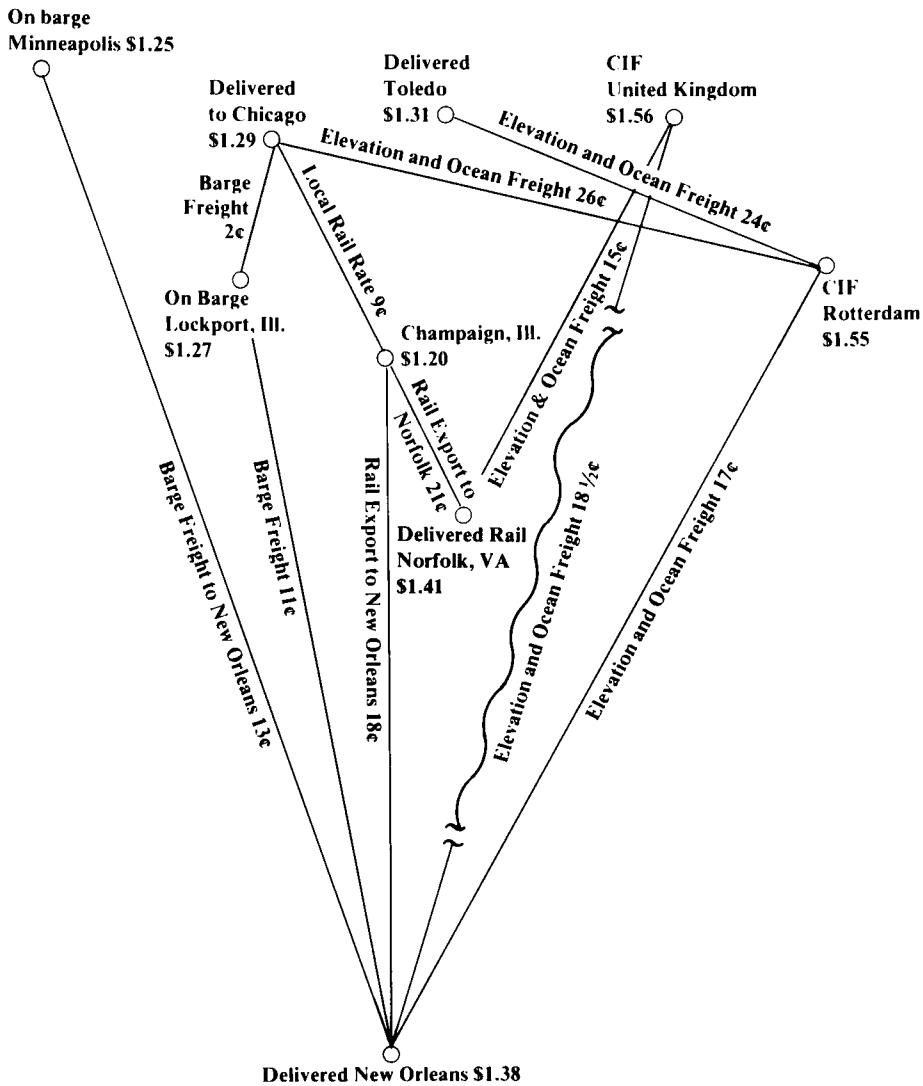
This illustration on the price relationship of corn values at interior and export points in the United States compared to CIF[1] values at the United Kingdom and Rotterdam was prepared by Mr. Ted Rice of our New York office. I feel this sketch is helpful in pointing out how values at various interior points in the United States relate to the world values, and it will also give you a picture of the cash value compared with Chicago futures prices. This relationship of cash price to a futures, or "basis," is the operating fundamental of a cash grain warehouseman.

For purposes of simplicity of calculation some of the values in the example are slightly different from actual. It must be remembered that ocean freight rates, including the differential between Gulf and St. Lawrence, change constantly. The interior prices shown are to the elevator loaded on barge, or freight car, as the case may be, and not the price paid to the producer. Elevator margins vary according to location and time of year. The purpose of the illustration is to point out a logical range of values relative to Chicago at a number of points.

Using the Chicago May corn future at $1.29, our bid to the country elevators for delivery by truck to our Lockport elevator would be a basis of 4 under May, or $1.25 (allowing 2¢ for elevation) which from the illustration would equal $1.29 Chicago or May price delivered Chicago. We would also be bidding the same $1.29 or May price delivered Chicago for rail grain from

[1] CIF means "cost, insurance, and freight."

Figure 1. Theoretical Price Surface for Corn



other origins. The truck bid is usually under rail because of the value of billing for transit purposes.

Let's look at this same illustration and go back to harvest last fall when Chicago December corn was $1.23 and May was $1.29 or a carrying charge of six cents was "showing on the board," and use Minneapolis corn for purposes of illustration. Navigation of the upper Mississippi River closes in early December and does not open again until late March or early April. Let's assume the buying basis delivered our Minneapolis river elevator during harvest was 9 cents under December, or $1.14. The elevator operator can place a hedge in the December corn at that time or can look at the May future and sales volume for opening of navigation for purposes of carrying charges. Let's say that this corn is hedged in the May at $1.29 so the cost of the corn is now 15 under May. During the months prior to opening of the upper river, trading is done on Minneapolis corn basis "opening of navigation." Let's assume in line with our illustration that sales are made basis 9 over the May, or 1.38 CIF NOLA with futures prices unchanged or $1.29 May. From this difference of 15 under to 9 over, or 24 cents, is deducted the barge freight of 13 cents, leaving 11 cents to cover elevation costs, shrink, interest, and other minor expenses. The interest on $1.14 corn for four months, December 1 to April 1 at 5⅞ is 1.9 cents per bushel. If we would place the other costs at approximately 3 cents then we have captured the six cents carrying charges showing on the board last fall at harvesttime.

Our sketch also shows the relationship of a central Illinois rail point, Champaign, Illinois, and the three-way possibility of merchandising rail corn from central Illinois to Chicago, New Orleans, or Norfolk. Because of many factors involved, this central Illinois corn will find a home at interior processing plants or elevators or it will move into export channels at one of the three points mentioned above. It is ideal for the central Illinois elevator to have all outlets competing for their offerings. The purpose of the foregoing was to bring out illustrations of carrying charges and basis in typical cash transaction.

Those of us in grain merchandising must be considered "opportunists" trying to devote our limited resources to those activities which present the maximum profit or minimum loss. For illustration of this point let's take a look at the wheat and corn futures close on the Chicago Board of Trade during the fall of last year as shown below:

Table 1

	October 15, 1964		October 30, 1964		November 16, 1964		November 30, 1964	
	Wheat	Corn	Wheat	Corn	Wheat	Corn	Wheat	Corn
December	1.49	1.20¾	1.51½	1.19	1.51½	1.20	1.51⅛	1.23⅛
March	1.52¼	1.24½	1.54¼	1.23¼	1.55¼	1.24½	1.54½	1.27⅜
May	1.53	1.26¾	1.54½	1.26	1.56½	1.26¾	1.55⅝	1.29⅜
July	1.49⅝	1.28⅛	1.50½	1.27¼	1.52⅜	1.28½	1.52⅛	1.30¾
September	1.51¾	1.25⅞	1.52½	1.25⅝	1.55	1.26⅜	1.54½	1.28⅛

These closing prices show the fluctuation of prices and spreads over a period of a month and a half. The December-May carrying charge for wheat ranged from 3 to 5 cents while the same December-May corn range was 6 to 7 cents. From the November 30th close, we can see the carrying charge for corn is in

line with our previous illustration reflecting approximately six cents from December to May with wheat showing 4½ cents for the same period with an inverse of 3½ cents to July because of new crop wheat available for delivery in July.

From an elevator management point of view, the relationship of carrying charges during corn harvest of these two commodities has to be compared. On October 30 the December-March corn carrying charge of 4½ cents against wheat at 2¾ cents plus the interest calculation due to price relationship would make wheat an additional ½¢ more expensive to carry than corn for the four-month period. In addition the carrying charge to May on wheat was only ¼ cent compared to 2¾ cents on corn based on the close October 30th. Therefore, wheat ownership should be liquidated and replaced with corn. The futures market prices tell us this, but it is easier said than done. It is clear that the Chicago market will try to liquidate wheat and increase corn ownership during this period of corn harvest and heavy movement. However, these same calculations are made by elevators in other parts of the country and the wheat buyers take this opportunity to be selective as to wheat class and grade and future billing requirements in making purchases against the elevator space they have available. During the period of corn harvest last year, the Chicago elevators were fortunate to find a limited outlet for red wheat in the southwest on an export rate to New Orleans that allowed transit at many Texas points. As a result, our red wheat was available to many Texas mills for blending purposes at a discount under southwestern hard wheats. The important factor duing these periods of heavy corn movement is to have as much space as possible available for corn. Delivery on the December wheat contract would not be the solution to an elevator space problem. The pressure of corn harvest is usually over by December. It is more expedient to find outlets during October and November as space is needed. We have been looking at the wheat and corn relationship in this case. Often sales of other commodities might be more advantageous if the elevator can replace with corn at a depressed harvest basis. For example last fall when the truck corn basis dropped to 6 cents to 7 cents under December basis No. 2 Yellow at the height of harvest congestion a buyer for a cargo of soybeans with a vessel for nearby lifting would find several anxious sellers.

In the Chicago market we say we always have a sale for our grain if it is of deliverable grade because a short futures position can be satisfied by the delivery of warehouse receipts against the short position. As in the case of the foregoing illustration on wheat and corn carrying charges, the "inventory management" phase of terminal operations comes into play as each delivery month approaches. It is a policy decision of the local elevator manager, after examining his elevator inventory and hedged position of the individual grains, to decide on delivery intentions. Each grain must be studied to anticipate the potential demand of processors and users of the grain. It may be more prudent to sell cash grain before the delivery month or withhold the grain from the delivery market for more opportune sales at a later date.

How are carrying charges made? In general, we say carrying charges are created by grain not being wanted at existing prices. We decide to make delivery on a futures contract when we are unable to merchandise the cash article at as good as delivery basis. Frankly, we seldom make delivery if we believe the grain will be ordered out. The party who receives delivery does one

of two things: (1) he pays for the warehouse receipts, leaves the grain in our elevator and starts paying us carrying charges, or (2) he retenders, that is, he sells futures and redelivers the grain to someone else. If the grain remains in our elevator after the original delivery, although the warehouse receipts may pass back and forth through several hands as the current delivery is being satisfied, we are: (1) relieved of interest and insurance costs, and (2) paid .06 cents storage per bushel per day. If the grain is retendered day after day, it tends to weaken the nearby contract relative to deferred contracts. As these carrying charges widen, we will decide at some point to buy the nearby contract and sell the deferred. Then we, as a long in the current future, recapture our grain and have it hedged in a deferred future at a better basis than that which existed prior to delivery.

Another factor in carrying charges is our tax structure. If a speculator buys a future and holds it six months and one day or longer, he is eligible to capital gain if there is a profit. Because of the tax advantage of capital gain there is a tax advantage for speculators to buy futures which offer long term possibilities.

Generally speaking, carrying charge markets are bearish since they indicate the grain is not wanted. However, this is not always true—in a major speculative bull market such as the 1955-56 and 1960-61 soybean markets, there is a tendency for the tax buying aspect to widen carrying charges.

Also, as a generalization, carrying charges are wide when elevator stocks at delivery markets are large and narrow when they are small. There can be exceptions to this for individual commodities.

Now let's consider why inverse carrying charges usually indicate a bullish situation. First, they indicate there is little threat of deliveries because the cash basis at the delivery market is higher than the owner can obtain by making delivery against the futures. Second, stocks are usually relatively small with cash grain stocks needed for merchandising. Since cash ownership by the trade is small, there is little short hedging pressure. The speculative element is usually convinced that current prices are temporary and will decline in the future. That is very logical in the most common inverse carrying charge situation—old crop/new crop such as May/July wheat or September/December corn.

Inverse carrying charges as above provide incentives for the grain trade to be short cash and long futures. Grain merchants will offer cash grain for deferred shipment at a discount relative to spot values. Grain processors usually operate with minimum inventory and cover forward needs at a discount. As time passes the long in futures will stand for delivery unless he can convert his futures to cash at a favorable basis. On the other hand, the speculative short who has no grain must buy back his futures at a price which will allow the trade to convert to cash at a profit. This is not to infer that the speculative short always loses money. The cash merchant who is long futures and short cash does not care whether the market goes up or down, he is concerned with the basis in relation to the futures so he wants to be able to cover his short cash premium position at a profit.

Another facet of the futures market in cash grain merchandising is the fact that length of time for trading with the use of futures for protection is extended at least nine months in the future. This enables sales in the spring of the year of new crop grain on a basis relative to new crop futures. In the case of soybeans with November futures at a discount or inverse of approximately 15 cents under the May there had been considerable buying of the new crop positions by many importing countries. In corn there has also been considerable sale of new crop for export at the discount of new crop under old crop.

Because it is normal for an inverse carrying charge to exist between old and new crop such as September and December corn, or August, September, and November beans, firms such as ours will have no premium ownership and will go into harvest short cash or premiums and long futures as a result of forward sales mentioned above where we have sold on a basis and bought new crop futures for protection.

As harvest expands, purchases of cash are made against sales of futures until the short premium position is eliminated. It is then that the grain merchant hopes that the buying basis relative to the futures is attractive and inventory accumulation can be made at a basis that will provide carrying charges for the inventory accumulated. As this accumulation is made the merchant is in a long cash-short futures position which is the concept most people have of grain elevator operators. Few people appreciate the grain trade's contribution in accelerating purchases at harvest by forward sales of cash commodities against purchase of futures as their protection.

In this discussion I have not mentioned government activity. Our markets are still based on the fundamental laws of supply and demand, but government sales, storage, price support, and pricing policies are factors that affect both futures and cash operations of the grain trade. The trade must be ever alert to these changes and their market effect.

This paper was originally presented in 1965 at the Futures Trading Seminar at the Chicago Board of Trade.