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COMMODITY FUTURES MARKETS -- ARE CHANGES NEEDED?

Key Words: Futures Markets, Hedging, Risk-Shifting Performance

Abstract:

The usefulness of commodity futures markets for hedging is affected by delivery conditions, contract size and related contract details. Impediments to delivery or contract specifications designed primarily for large hedgers can reduce competition in such markets, thus lowering risk-shifting performance under certain conditions. Reduced risk-shifting performance was evident in grain futures markets in 1973.

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COMMODITY FUTURES MARKETS -- ARE CHANGES NEEDED?

Robert N. Wisner and J. Marvin Skadberg

Commodity futures markets play a major role in pricing and marketing grains and certain other agricultural commodities. Their effectiveness as a risk-shifting mechanism influences both prices paid by final users of the commodities and prices received by producers. A major premise of this paper is that stresses on the marketing system as a result of unprecedented increases in export movement have reduced the effectiveness of futures markets in performing their risk-shifting function. If this premise is accepted, it follows that these institutions should be examined carefully to determine whether their risk-shifting performance can be improved. ^{1/} The authors believe special attention should be given to delivery conditions and related details of futures contract specifications. Delivery impediments or contracts which do not fit the needs of a major portion of the industry can cause commodity futures markets to differ considerably from the perfectly competitive ideal, and can alter their risk-shifting performance, as will be shown below. Conversely, the need for extensive regulation of futures markets is reduced as conditions in these markets move closer to the perfectly competitive ideal.

Importance of Delivery Conditions

According to economic theory, futures prices at the time of contract expiration should equal cash prices for the same commodity at the delivery

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point, except for minor differences due to quality and market position. If futures prices are substantially above cash prices, firms have an economic incentive to sell futures contracts, buy the cash commodity and deliver it on the futures contracts. This arbitrage process will force futures prices down and/or bid up cash prices until the two are approximately equal if there are no hinderances to delivery. If cash prices are substantially above expiring futures quotations, users of the commodity (and speculators) have an incentive to reduce cash purchases and buy futures contracts to be held for delivery. This process will bid up futures prices relative to cash prices until the economic incentive for delivery disappears. The key assumption in this process is that no major hinderances to delivery exist and that delivery is an alternative available to a major portion of the traders in the market.

Hedging theory shows clearly that arbitrage between cash and futures markets, and the threat of delivery are important in performing the risk-shifting function. According to traditional concepts, hedging involves matching risks in the cash market with equal and opposite risks in the futures market. For example, consider grain processors who sell their products at a fixed price for later delivery before they can purchase needed grain in cash markets. Usually such firms buy futures contracts at the time forward product sales are made. Later, when the grain is purchased, the futures contracts are sold. In transactions such as these, losses caused by an advance in grain prices are expected to be offset by gains from the sale of futures contracts [2, pp.60-61]. The

gains will offset cash losses if cash and futures prices move in the same direction by approximately the same amount, a condition insured only by the threat of delivery on futures contracts. Holbrook Working identified several other kinds of hedges in addition to this pure risk-avoidance type [5]. To encompass the other types, hedging can be defined more broadly as the making of a futures transaction as a temporary substitute for an intended later cash transaction [4]. It can be shown that this definition also requires a stable and predictable relationship between cash and futures prices, with the two prices (at the delivery point) converging except for relatively constant and predictable differences due to quality and market position. If the two prices do not follow a predictable relationship, the futures transaction is not an effective substitute for a later cash transaction.

1973 Experiences

As evidence that risk-shifting performance recently has been reduced, consider cash-futures price relationships in the Chicago corn and soybean futures markets during the summer of 1973. An extreme case is reflected by the expiration of July corn futures prices on July 20, 1973 at \$3.80 per bushel, \$1.13½ per bushel above Chicago cash prices for No. 2 yellow corn. ^{2/} In past years, Chicago cash and expiring corn futures prices have seldom differed by more than 5 to 8 cents per bushel. The wide spread between cash and futures prices caused large unexpected losses for grain elevators and producers lifting short hedges at that time. The spread also was a market signal to deliver on contracts rather

than closing out hedges through offsetting futures transactions. However, futures contract specifications required delivery to be made in approved Chicago warehouses, and several midwest grain elevators report delivery was physically impossible at that time due to large volumes of grain moving through Chicago export channels and lack of available storage space in the approved warehouses. Similar conditions existed simultaneously in the soybean market. On July 10, 1973, for example, nearby soybean futures prices were \$1.19 above the Chicago cash price. On July 17, futures prices were \$1.77 above comparable cash quotations.^{3/} Such price relationships, for a short hedger, would generate futures losses substantially exceeding cash gains and would greatly reduce the effectiveness of the futures market as a risk-shifting mechanism. With continued uncertainty over delivery possibilities, one would logically expect wider marketing margins as a way of compensating for the additional price risks. Wider margins would affect prices received by farmers and/or prices paid by commodity users.

Ideal Delivery Conditions

In light of last summer's experiences, we believe several aspects of delivery in futures contracts should be re-examined, including the number and ownership of delivery points, time required for delivery and position of delivery. These aspects of futures markets have not been given extensive attention in published literature. The likelihood of delivery difficulties is increased by sharply expanded grain movements relative to handling capacity at major markets. For this reason, we

believe the 1973 experiences were not a temporary phenomenon, but one that could take place with increasing frequency unless changes are made to prevent its reoccurrence. Economic theory suggests ideal delivery conditions would include the following:

1. Futures contracts reflecting the same quality and market positions (i.e., on-track vs. in warehouse) as commonly prevailing cash prices at delivery points.
2. Sufficient delivery points so that the threat of delivery cannot be diminished greatly by local transportation strikes, market handlers' strikes, or other unusual circumstances.
3. Adequate storage, handling and in-bound transportation facilities at the delivery points so that the threat of delivery and potential receipt of delivery is operational at all times.
4. Year-around transportation outlets for the commodity at the delivery points.
5. Ownership of delivery facilities by a relatively large number of firms, so that no one firm can significantly impede delivery.
6. An adequate time period for making and receiving delivery, considering normal in-transit times from outlying areas to delivery points.
7. Economically sound price discounts and premiums for non-par delivery points.

These conditions are discussed in detail below and are related to the risk-shifting performance of futures markets.

Quality and Market Position

Quality specifications have not been a major consideration for corn and soybean futures markets, although potential difficulties do exist for wheat, feeder cattle and certain other commodities where a wide range of types or qualities of product are traded in cash markets. The problem is most acute when cash price spreads for different quality levels vary substantially through time. Alternatives for dealing with this aspect of delivery include (1) separate futures contracts for each of several major types or qualities, (2) variable premiums or discounts for delivery of non-par qualities, depending on cash market conditions, and (3) constant premiums or discounts for delivery of non-par qualities. As an example of contracts with potential problems, the Chicago wheat contract permits delivery of No. 2 soft red, dark hard winter, hard winter, yellow hard winter, dark northern spring, heavy northern spring and No. 1 northern spring, all with no price discounts [1]. Cash prices can vary substantially among these types of wheat, depending on market conditions. As a result, the futures market tends to reflect the type of wheat most readily available for delivery in Chicago and could be basically a soft red market at some points in time, but a spring or hard winter wheat market at other times. Such shifts from one type of wheat to another would lower the risk-shifting performance of the market.

In regard to market position (on-track vs. warehouse delivery), some observers suggest the unusually wide spread between cash grain prices and futures quotations in 1973 reflected large elevation charges

rather than weaknesses in the futures market itself. According to this argument, elevator handling capacity in Chicago was short in relation to demand for that capacity. Therefore, to ration available capacity elevation charges rose. ^{4/} Since warehouse delivery was required, it was logical that futures prices would be above cash quotations by the price of elevation. This argument is valid, but if carried further it reveals that Chicago grain futures prices are not directly comparable to the usual "on-track" cash prices. If elevation charges are subject to large fluctuations, it would seem logical to remove this element from futures prices, thus making futures quotations more comparable to cash prices and improving the risk-shifting performance. The "elevation charge" could be removed by permitting "on-track" delivery for grain futures contracts. ^{5/} The authors believe on-truck delivery also could be incorporated into grain futures contracts if appropriate specifications and restrictions were developed.

Sufficient Delivery Points

When a single delivery point or only a small number of delivery points exist, the market's risk-shifting function could be disrupted by unusual hinderances to delivery. Local transportation or handlers' strikes, market congestion at the delivery locations or other temporary conditions could cause a failure of cash and futures prices to converge at contract expiration. To minimize such problems, ideal delivery conditions would require more than one delivery point. Multiple delivery points also would reduce the chance of market squeezes occurring.

Adequate Storage and Handling Facilities

Adequate storage, handling and in-bound transportation facilities are factors that help to determine how many delivery points are needed to maintain a continuously effective threat of delivery. The larger the capacities relative to normal commercial demands, the fewer the number of delivery points that would be needed. It also should be noted that the adequacy of capacity may change over time due to growth in physical movement of grain through delivery facilities, changes in the number of approved facilities and/or growth in the volume of futures trading. As an example of recent changes, the total volume of Chicago grain futures trading increased from 10.6 billion bushels in 1960 to 42.8 billion bushels in 1973. ^{6/} Storage capacity of approved delivery elevators in Chicago during this same period dropped from 67.6 million bushels to 56.8 million bushels, ^{7/} and receipts of grain at Chicago dropped from 202.9 million bushels to 180.6 million bushels. ^{8/}

Year-Around Transportation Outlets

For commodities commonly transported by water as well as by land transportation modes, adequate year-around transportation outlets are an important requirement for delivery points. From an ideal standpoint, delivery locations depending on river or lake navigation systems that are closed during the winter may need to be supplemented by alternate delivery points. Otherwise congestion at delivery points could exist at times during the closed navigation season, with the result that the threat of delivery may be impaired.

Ownership of Delivery Facilities

To approach perfectly competitive conditions in commodity futures markets, the authors contend that not only are large numbers of buyers and sellers needed at all times, but also a large number of potential deliverers and receivers of delivery is required. The theory of imperfect competition suggests that when only a small number of firms own the delivery facilities, tacit collusion by those firms at times could limit delivery possibilities for holders of futures contracts. To insure competitive delivery conditions, it seems advisable to spread the ownership of delivery facilities over several firms. As an example of prevailing ownership patterns, delivery facilities for Chicago corn and soybean futures contracts were owned entirely by five firms until recently. ^{9/} The three largest firms owned 81 percent of the approved delivery warehouse space in 1973.

Adequate Time for Making Delivery

Contract specifications in Chicago grain futures markets allow two basic delivery alternatives at the present time. Direct warehouse delivery may be made at any time during the approximately twenty business days of the contract expiration month, provided the grain is already in an approved warehouse. The other alternative permits delivery in rail cars in the Chicago switching district during the last three business days of the delivery month, provided the grain is consigned to an approved delivery warehouse. In this case, the delivery process is not considered complete until warehouse receipts are issued for the grain. ^{10/}

The three-day time requirement in the latter alternative may reflect more precision in shipping cash grain from out-of-position locations to the par delivery point than is normally possible and thus may tend to impede delivery on futures contracts. Hinderances to delivery would reduce the number of potential deliverers, thus causing a potential departure from competitive conditions. Time allowed for delivery becomes less critical in futures markets where several delivery points are dispersed throughout the primary producing region.

Sound Price Discounts and Premiums for Non-Par Delivery Points

In markets where multiple delivery points exist, alternatives for adjusting non-par futures prices include: (1) separate contracts for non-par locations, (2) discounts and/or premiums that vary through time with cash market conditions and (3) fixed premiums and/or discounts for non-par delivery. Crow, Riley and Purcell point out that the last alternative is appropriate when market conditions approximate those of a basing-point pricing system. They note that alternatives (1) and (2) are better suited for other situations [3]. We agree with these conclusions but would add that alternative (2) has the disadvantage that under certain conditions a few large firms could influence cash prices at a non-par location for the purpose of altering premiums or discounts of futures quotations. ^{11/}

Other Areas Deserving Attention

The size of futures contracts discourages certain types of potential hedgers from using the market as a risk-shifting tool. Included

in this category are grain and livestock producers, as well as some country elevators and feed dealers. Each of these potential users is faced with rising capital requirements, an export-oriented grain economy, and a more variable price situation than at any time in the recent past. These conditions greatly increase the importance of risk management and the need for an effective risk-shifting mechanism. Current hedging possibilities for such firms, however, are limited by 100 ton soybean meal contracts, 5,000 bushel corn and soybean contracts, 30,000 pound live hog contracts and similar contract sizes in other markets. For the average producer, these contracts are too large to permit effective hedging.

Smaller contracts would likely raise the per unit cost of trading. However, there are several ways this problem could be handled. One alternative would be to offer two different futures contract sizes including present contracts as well as smaller ones, perhaps half the size of current contracts. The smaller contract might carry a larger brokerage fee per unit than the larger one to compensate for increased costs. Another possibility would be to lower the size of all contracts, but provide a reduced brokerage rate for traders dealing in multiples of two, four, and eight or more contracts. ^{12/}

If the number of hedgers could be increased through changes in contract size, it appears that competition in commodity markets would move closer to the perfectly competitive ideal. Under present circumstances, many firms who may wish to hedge in commodity markets are encouraged in-

stead to forward contract with large firms. The large firms in turn cover such contracts by hedging in commodity futures markets. This process tends to reduce the number of traders in the market and concentrates hedging more in the hands of larger firms. It is possible that smaller futures contracts also would increase trading by small speculators and thus would further increase the number of buyers and sellers in commodity markets at any point in time.

Concluding Comments

With recent stresses on the marketing system, particularly for grains, but for other commodities as well, delivery aspects of commodity futures markets are more critical than in the past. Delivery conditions are a major influence on the risk-shifting performance of futures markets and for this reason the authors believe they warrant increased attention by the agricultural economics profession, commodity exchanges and regulatory agencies. If the threat of delivery and receipt of delivery is operational at all times, the probability of market squeezes, manipulation of prices by a small number of large traders and related problems is reduced. A closer look at contract sizes also is warranted. In some cases, current contracts favor large firms at the expense of smaller ones that also have sizable needs for price protection. It appears that contract sizes could be adjusted to facilitate hedging by both categories of firms.

FOOTNOTES

- 1/ Although this paper concentrates largely on grain futures markets, the principles involved also apply to futures markets for live-stock and other commodities.
- 2/ Source: USDA Grain Market News Service, Chicago.
- 3/ Ibid.
- 4/ Published elevation charges remained relatively constant, but according to this view, implied elevation charges (price differences between on-track and in-warehouse grain) rose to ration available warehouse space.
- 5/ "On-track" delivery was formerly permitted for Chicago grain futures contracts and is presently allowed in some other U.S. grain futures markets.
- 6/ Source: Market Information Department, Chicago Board of Trade.
- 7/ Source: Commodity Exchange Authority, U.S. Department of Agriculture.
- 8/ Source: Market Information Department, Chicago Board of Trade. On a quarterly or monthly basis, the change in Chicago receipts may have been larger at times than indicated by annual data.
- 9/ At this writing, plans are being made to add additional delivery space at Toledo, Ohio and St. Louis, Missouri but these locations have not yet been officially approved.
- 10/ Source: Personal correspondence with the Chicago office of the Commodity Exchange Authority, U.S. Department of Agriculture.
- 11/ Cash prices at the par delivery point also could be manipulated for similar purposes under certain conditions.
- 12/ A modification of this system is presently being implemented by U.S. Commodity Exchanges.

REFERENCES

- [1] Board of Trade of the City of Chicago, Commodity Trading Manual, Wilmette, Illinois, Commodities Press, 1968.
- [2] Collier, G. A., Grain Production and Marketing, USDA, PMA, Misc. Publication No. 692, October 1949.
- [3] Crow, J. Richard, Riley, John B. and Purcell, Wayne D., "Economic Implications of Nonpar Delivery Points for the Live Cattle Futures Contract," Am. J. Agr. Econ., 54:111-1115, Feb. 1972
- [4] Working, Holbrook, "Hedging Reconsidered," J. Farm Econ. 35:544-561, Nov. 1953.
- [5] Working, Holbrook, "New Concepts Concerning Futures Markets and Prices," Am. Econ. Rev. 52: 431-459, June 1962.