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CHAPTER 6.

CONCLUSIONS AND RECOMMENDATIONS

This study was undertaken because of widely shared concerns that the CBOT's three principal agricultural futures contracts were not performing well. At various times, market participants have expressed specific worries about matters as diverse as declines in hedging effectiveness, illiquidity, perplexing price patterns, and allegations of manipulation. All point to concern about the specific terms of the contracts. Hence this study focuses on deliveries and on the price patterns just before and during the period of contract expiration.

The prevailing wisdom has been that deliveries are an insignificant aspect of futures markets; indeed, that large deliveries are a symptom of a contract in trouble. As the analyses here show, the prevailing wisdom is in need of significant modification. Many futures markets, including the CBOT wheat, corn, and soybean markets, have delivery on the order of 10 to 20 percent of peak open interest. Moreover, of those positions still outstanding on the day just before the delivery period, as many as 50 percent are satisfied through actual delivery.

Deliveries on the three CBOT markets appear to be rational, in the sense that they respond to observable economic incentives. Not surprisingly, the amount of deliveries in any one month is primarily connected to the amount of free stocks in the deliverable locations. Thus, the amount of deliveries is both directly and indirectly influenced by the observed carrying charge, with the smallest levels of delivery occurring in periods of price inversions and lowest stocks. The influence of stocks and of the carrying charge is also true for the level of deliveries in Chicago and Toledo taken separately. The timing of deliveries within the delivery month also follows the rational pattern that a theory of "embedded options" would suggest. Shorts take advantage of their option to deliver late in the month whenever carrying charges are negative, and conversely. In these relationships, the spread between the expiring and next futures is generally a stronger influ-

ence than is the basis, although the latter does contribute to explaining the amount and timing of deliveries for some of the commodities.

In addition to the practical importance of deliveries and their connection to economic fundamentals, a number of other relations have been examined, including that between stocks of wheat, corn, and soybeans in deliverable locations and so-called visible supplies and nationwide stocks. Similarly, the degree of basis convergence has been looked at, especially in Chicago and Toledo. Using weekly prices from eight country elevators in Illinois, the degree of hedging effectiveness has been examined, as conventionally measured by the correlation between changes in futures prices and local cash prices, of the corn and soybean contracts.

In all these comparisons, one question was whether they had changed in the 1987/88 and 1988/89 cropyears in particular, or in the 1980s more generally. Although there is some evidence of change in some of the measures in 1987/88 and 1988/89 compared to the early 1980s, this effect is not pervasive. Changes in averages among all the periods are also hard to identify statistically because of the variability in the series themselves. For example, relations among the various stocks measures and among all the periods were quite variable and, in soybeans the 1987/88 and 1988/89 relations differed too. But, even though basis convergence changed with the addition of Toledo, convergence in the 1987/88 and 1988/89 cropyears did not appear to be different from that in the 1980s more generally. Hedging effectiveness (as measured by correlation coefficients) in the soybean market in the last few years was found to be lower compared to the early 1980s, but it was higher than the average achieved over the whole period 1967–89.

Rather than a period of sudden and marked changes in performance, the late 1980s might be more accurately characterized as continuing long-term trends, ones dating to the 1960s if not earlier. A number of these trends are worrisome. For example, the degree of basis convergence for prices in the principal delivery location appears to have worsened in the 1980s compared to the 1960s. To be sure, most of measured decline in convergence is the effect of multiple delivery on the basis in any one of the delivery locations. Nevertheless, holding constant the effect of adding Toledo, basis convergence in Chicago has deteriorated from the 1960s to the 1980s.

Deliveries on the three CBOT contracts have also been increasing as a percentage of deliverable stocks. Often total deliveries in a month are more than 100 percent of deliverable stocks (which obviously reflects the redeliveries present in the statistics). Even deliveries on the first business day, which must all be original deliveries, are often 50 percent or more of deliverable stocks. More important, both these first-day deliveries and the total deliveries are now much higher proportions of deliverable stocks

than observed for either KCBOT wheat or Comex copper or for the CBOT commodities themselves in earlier eras. The suggestion has been made that such high ratios reflect the greater efficiency of CBOT stocks in settling contracts. Quite apart from the disruption if someone should decide to hold onto receipts rather than redeliver them, other evidence suggests an interpretation that stocks are simply too low.

The CFTC has provided the positions of the four largest longs and the four largest shorts day by day for each of the CBOT grain and soybean expirations over 1982–89 and for the KCBOT wheat and Comex copper expirations over 1985–89. In all five of these markets, the four largest longs together and the four largest shorts typically account for more than 40 percent of the open interest as of the first position day. Where the CBOT markets differ is that the positions of the largest traders are much larger than the current deliverable stocks. Almost every expiration, the four largest longs together have a call on and the four largest shorts have commitments to deliver much more than the available stocks. The average for both wheat and corn is a multiple greater than three. For soybeans, they are more than two times the available stocks. Although some of these positions are regularly settled by exchanges against physical market positions, the positions are of such a size relative to the stocks that delivery or even the threat of delivery is no longer a credible alternative to a sufficient number of the short positions.

The paucity of stocks in deliverable locations does not result from a direct constraint on warehouse capacity. Rather, total stocks of wheat, corn, and soybeans in Chicago and Toledo in recent years have not filled listed capacity, although percentages are slightly higher than those from earlier years. Rather, grain is not being attracted to Toledo and, even more so, to Chicago. One such reason may be that the official price of warehouse space (4.8 cents per bushel per month) is now relatively higher than the market's value of that space, as reflected in the maximum interest-rate-adjusted spreads observed each year. Although this gap between official and market prices of binspace may give the warehouse operators an incentive to deliver (to put receipts out on the street), it places other participants at an increasing disadvantage in holding stocks, which may preclude them from remaining in the market until the delivery period. In any case, it is not obvious why the official fee should remain constant for many years when almost nothing else in the grain trade does. Indeed, the fee was raised comparatively frequently during the 1970s as the differentials observed in the market seemed to dictate. In the 1980s by contrast, the market differentials have been declining steadily, but there have been no comparable adjustments in fees.

According to other evidence, the (interest-adjusted) spreads in the 1980s compared to earlier periods have tended to narrow during the course

of delivery months. Moreover, the amount of the narrowing each month was found to be significantly associated with the net concentration of the largest traders at the beginning of the month. This evidence also suggests that the contracts are increasingly jeopardized by the comparatively low stocks. Deliveries directly and movements of grain into deliverable positions indirectly should, if anything, increase spreads. Instead, spreads regularly narrow. The high degrees of concentration mean the large shorts cannot all deliver, and thus the longs can wait until the shorts trade out of their positions and affect prices.

Fundamentally, the paucity of deliverable stocks arises because of the inexorable decline of grain terminal markets, Chicago in particular. The CBOT contracts calling for delivery in Chicago elevators emerged in the halcyon days when the area tributary to Chicago was the dominant grain growing region in the United States and when most grain in the region passed through Chicago elevators. The trend has been downward for the 100 years since, with important effects especially in the last 20 years. The area near to Chicago is responsible for less production in percentage terms, and in the case of soft wheat, in absolute terms. Likewise, less and less grain and soybeans in percentage terms passes through any Great Lakes port.

Two specific reforms, additional terminal market delivery points and cash settlement, have been proposed. Given the causes of the problems with the CBOT contracts, neither would work. An additional terminal location, namely Toledo, has already been tried and with some success. The corn contract also added St. Louis as well, but there have been no deliveries in St. Louis since July 1981. (With a different discount, of course, St. Louis might have been more useful.) But among the terminal markets at all close to Chicago, Toledo is by far the largest in terms of receipts and stocks; the obvious candidate has already been selected. More important, the primary terminal markets together have been suffering declines in receipts as fast or faster than Chicago. Less and less grain and soybeans are marketed through them as sales are more and more from farmers directly to processors and other merchandisers.

Toledo was conceived of as a safety valve to Chicago, and discounts were set for Toledo delivery that would discourage delivery there unless Chicago cash prices rose to an unusual premium. The corn and soybean markets apparently work this way in practice; during many expirations Toledo deliveries are a small share of total deliveries. In wheat by contrast, in most expirations neither Toledo nor Chicago dominates. The result of any change in the official discounts is hard to predict. The existing discounts were set by reference to the USDA cash quotations. Yet these same USDA quotations, which are processors' bids, are not strongly associated with the observed patterns of delivery. Hence, analysis with these quotations will

not help the exchange or the regulators set more appropriate discounts.

The fundamental decision, however, must be whether Toledo should be a safety valve for Chicago or whether it should be a true multiple delivery location. If it is desired as a safety valve only, then the present discount in wheat surely needs to be increased. If, however, Toledo is expected to play a regular delivery role for all these markets, the evidence suggests the present corn and soybean discounts need to be decreased.

A second proposal, cash settlement, presumes a deep and active cash market, from which reliable quotations can be taken. Yet active cash markets have been the first casualty of the decline of terminal markets. Even now it is not clear how many transactions occur at any of the posted prices—or, what size transaction would cause them to change. What would discipline firms who now provide the nominal bids to the USDA, inasmuch as they are not obliged to transact at those prices? The potential for manipulation—and nearly as disruptive, allegations of manipulation when none occurred—would be greater with cash settlement than even physical delivery. The experience of the stock index futures is instructive here, where the securities markets, which are many times broader and deeper than the cash grain and soybean markets, were not broad or deep enough to prevent significant congestion at contract expiration. To substitute for liquidity in any one cash market, some have suggested an index-type settlement including prices from many locations in the index. But this is no solution: When each price can easily be influenced, the entire index can be influenced.

Instead, it would seem important for all the participants to take the opportunity to rethink the need to deliver grain in store. At one time, the warehouse receipt was the only method of delivery. But the plethora of commodities now traded on exchanges has led to important innovations in settlement terms. One possibility might be to design terms for barge delivery, incorporating aspects of a call on production. Another possibility, which might be considered if the Gulf were to become the principal delivery location and where the elevators are primarily used for throughput, would be to model the delivery terms on the New York Mercantile Exchange's crude oil and heating oil contracts. Delivery is at a loading terminal or pipeline, at buyer's option as to time of lifting, with one month's notice given.

More to the point, the CBOT now has the remarkable advantage that many different forms of delivery mechanisms have been incorporated into contract terms. Their existence provides officials with the laboratory that has already tested the effects of various provisions. How well, for example, do contracts settled with a call on production encourage storage during periods of surplus and discourage it in shortage? Have the terms of the petroleum contracts performed this function, too? The specific questions that need to be addressed are best known to the exchange and the partic-

ipants. Many alternatives could be analyzed with experience gained from other contracts.

Finally, in almost all circumstances, a completely new contract would not compete well with the existing contracts, because the existing contracts would retain the overwhelming advantage of greater liquidity and familiarity at the beginning. Such a problem plagued the launching of the CBOT's Gulf-delivery contract in the 1970s. Whether or not a better design, it never attracted enough trading to challenge the existing contract's liquidity. Change in contract terms will not be easy; but, the evidence here leads to the conclusion both short-term adjustments are needed and that the search for long-term solutions should begin.

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