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Minnesota AGRICULTURAL ECONOMIST

Futures Trading in a Changing Economic Environment

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INTRODUCTION

A futures market is one of several types of markets that exist in our present day agricultural economy. Other market types include barter markets, cash or spot markets, to-arrive markets, and forward markets.

The separation of markets into these categories involves the use of criteria that distinguish whether a medium of exchange is used, the time of product delivery, and the way in which the product being traded is described. For example, an obvious difference between the barter market and the cash market is that a medium of exchange — money — is excluded in barter transactions. A major distinction between a cash market and a to-arrive market is the time of delivery. And an important difference between a forward market and a futures market is that in the forward market a product always is delivered. In a futures market, products usually are not delivered on the contract to fulfill a transaction.

Market Risk

A futures market has several functions, but risk-shifting, pricing, and financing stand out as most important. Most producers and marketing firms are familiar with various types of risk. They often incur risk of loss due to product destruction by natural or social hazards, physical deterioration of the product, and a decrease in the product's market price over time.

Insurance, diversification, and forward trading offer some possibilities for reducing physical risks. Protection against price risk is not as clear cut. However, transactions in futures contracts are made by many production and marketing firms in an effort to shift risks due to price changes.

Market Participants

A futures market consists of buyers and sellers who take roles as hedgers or speculators. Those hedgers and speculators who sell contracts in the market are said to take "short positions." Those who buy contracts in the market are said to take "long positions."

The frequently used example of a short hedger (one who sells a contract) is a country elevator operator. When purchasing grain from a farmer, he sells a futures contract to offset his purchase and so guard against substantial price declines while the product is in storage.

An example of a long hedger (one who buys a contract) is a commercial feedlot operator who wishes to avoid the possibility of a substantial increase in the price of feed grains between the present time and the time he needs them for his feeding program. Purchasing grain at the beginning of the feeding period involves price risk. If the price drops, the operator has made the wrong decision and experiences loss. But delaying the purchase of grain also may involve price risk. If the price of grain increases, he has made the wrong decision and will lose. Purchasing a grain futures contract will help avoid either situation. If the price of grain does increase, the operator can sell the purchased contract for more than he paid or accept delivery at the contract purchase price.

A speculator is an individual who buys or sells a futures contract in anticipation of a price change favoring the position he takes in the market.

In either of the hedging cases, the ability of the country elevator operator or the feeder to protect himself from adverse price change depends on his ability to predict the "basis" (differential between the spot cash price and the futures contract price). Generally, the basis is more predictable over time than the future cash price. To the extent that it is possible to predict the basis change, shorts or longs can hedge effectively against cash price changes. To the extent that the basis is not predictable, they in effect speculate on the basis during a normal hedging operation.[1]

[1] For a review of the specific mechanics of trading futures, see Agricultural Economics Fact Sheets 1, *Futures Trading in Beef and Live Beef Cattle*, and 2, *Futures Trading in Hogs*, Agricultural Extension Service, University of Minnesota.

Whether or not risk-shifting is the prime function in futures marketing continues to be controversial. Some people feel that the prime function of the futures market is to establish price and even out variations. Others suggest that its primary function is to serve as a financial institution.

Approximately 35 agricultural commodities are traded on United States commodity exchanges — evidence of their functional importance. The list below includes some of the agricultural commodities traded on 15 exchanges in the United States.

Feed grain products: cottonseed meal, corn, oats, rye, soybeans, flaxseed, barley, soybean meal, grain sorghum, millfeeds

Food grain products: soybean oil, wheat, potatoes (Maine), rice, onions, cottonseed oil

Livestock: beef carcasses, beef cattle, tom turkeys, hogs, broilers, feeder cattle

Livestock products: eggs (frozen), eggs (shelled), hides, pork bellies (frozen), wool (grease), wool tops, butter, lard, tallow

Fibers: cotton

CONDITIONS OF ENTRY

A number of the commodities listed have come into existence since 1960. Within the past 4 years, live beef cattle, live hogs, chickens, beef carcasses, petroleum, and other commodities have begun to be traded on futures markets in the United States.

Some people have found the entry of these new commodities into futures trading somewhat surprising. Their surprise is due to the fact that the entry conditions associated with these commodities are different from the specific conditions of entry that traditionally have been considered necessary. In other words, some of the entrants did not meet all of the traditional conditions.

Traditional Conditions

The traditional conditions for entry include: (1) The commodity traded in a futures market should be in abundant supply and must be an article of general demand, (2) The market should include an adequate number of operators who purchase and sell the commodity, (3) The commodity must be fully standardized, (4) The commodity must be durable with adequate storage facilities, and (5) The commodity must be valuable in proportion to its bulk, and the volume of trading in futures in that commodity must be large enough to make transaction costs smaller than in the cash market.

Suggested Conditions

After careful review of these conditions in the light of the new products that have entered trading in futures markets, the following conditions appear to approximate more nearly the necessary con-

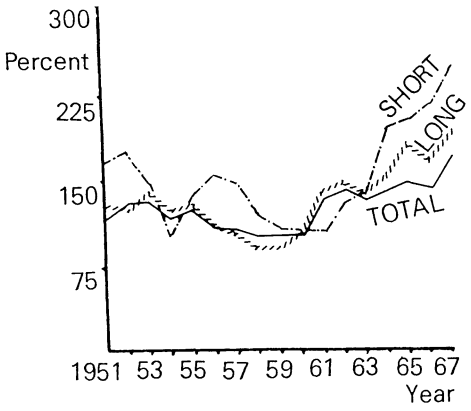

Figure 1. Index of total open, short, and long hedging futures trading (commodities included in index are shown in figures 3 and 4).

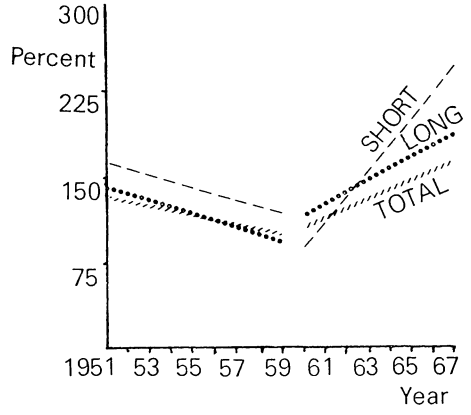

Figure 2. Trends in index of total open, short, and long hedging futures trading.

ditions for the mere entry of commodities into futures trading.

Cash and futures prices must exhibit a reasonable degree of variability. This particular precondition is necessary to assure the possibility of gain for the speculator who might enter the market. It must be great enough so there is a true potential loss to the hedger due to market price changes.

Adequate inventory facilities must exist at differing levels and locations in the marketing system. One of the reasons for the existence of a futures market is the discontinuous supply of products between the producer and intermediate or final customers. This discontinuity must exist in order for a futures market to exist. Because of this condition, facilities for holding products over time also must exist. Such facilities include regular warehousing or storage facilities, transport facilities, and processing facilities.

There should be no one buyer or seller in a futures market who can influence price by his action alone. This condition includes buyers and sellers in cash markets as well. If buyers and sellers in either the futures or cash market can influence price, the competitive position of other participants in the futures market will be affected.

This condition, which suggests a high degree of competition, must exist in futures markets in order to attract speculators. Speculators must be assured of the possibility of gain, but they also must be assured that the market will not be manipulated either intentionally or unintentionally. In other words, speculators seek a pure gamble to the extent they can. Also, hedgers must depend upon competition within the speculative group in order to assure a healthy hedge situation.

Terms of trade must be mutually understandable and agreed upon. Unlike the restrictive specifications previously stated, the product does not have to be exactly standardized, nor does it have to be storable in order to be traded on futures markets. Rather, the product must only be in identifiable form at the end of the contract period. In other words, at delivery time it is immaterial whether the product has been stored through time, transported over space, or changed in form. The essential requisites are that it be identifiable at that time and deliverable according to contract. Attainment of these conditions depends on whether or not (1) the product can be accurately described, (2) a workable grading system is in operation, and (3) the specifications of the futures contract are well developed and clear.

Implications

The foregoing factors suggest what types of products might be able to enter into futures trading activity. In fact, entry potential exists for a large number of products since entry conditions are not too restrictive.

However, it is important to note that many of the new commodity contracts developed recently have not been very viable or actively traded. For example, neither the beef carcass nor feeder cattle contracts has shown early signs of continued success. These situations suggest that it may be somewhat easier to develop (enter) a futures contract than to get it traded. A review of growth and decline activity in selected commodities will provide further insight.

GROWTH AND DECLINE

If we look at the total volume of futures trading in 17 major commodities[2] traded on U.S. exchanges in 1951-67, we see that total futures trading on a trend basis has increased nearly 60 percent from the 1959-60 base (figures 1 and 2). This increase was greater in terms of short positions in the market than in terms of long positions taken. The total long hedging trend increased by about 90 percent during the period, while total short hedging increased by nearly 150 percent.

[2] Livestock futures were not included because the time period is still too short to establish a trend.

While overall activity in futures trading is identified by these indices, understanding why particular changes have occurred requires particular study of individual commodity futures.

Trend lines for individual products are shown in figures 3 and 4. They are grouped according to the nature of the movement of the trend in the indices. Not all of the commodities followed the V-shaped path of total open trading.

Three factors that have contributed to these various movements are considered here: (1) government price support programs, (2) structure of the production-marketing system, and (3) intermediate or final demand for the product involved. Some of the individual commodity trends substantiate and illustrate the effect of these factors.

Policy

One of the most influential factors in the supply of most agricultural commodities has been the risk protection of **government price support programs.** Support programs tend to reduce seasonal price movements and eliminate part of the risk associated with storing grain. Both of these conditions were sighted earlier as being needed to support futures market activity. Recent rises in futures trading of wheat, corn, and cotton illustrate the importance of government dominance and control of substantial quantities of stocks on hand and their influence in commodity trading activities.

The recent general rise in wheat trading on commodity futures, for example, is explained by the general decrease in stocks held by the government over this time period, as well as by the substantial increase in private stock holding in peak years of commodity trading activity.

At the other extreme, futures trading in cotton has declined from very high activity to nearly no activity due to substantial increases in Commodity Credit Corporation stocks of cotton. The cause is a combination of production increases in other countries in an effort to meet their domestic needs of cotton and a decline in the demand for cotton with the advent of synthetic fibers. Changes in activity in many of the other grain commodities also can be explained by viewing government price support activity.

Supply Structure

Substantial **change in the production and marketing system** helps explain why some of the changes in trading activity have come about. For example, a general declining trend in per capita consumption of raw potatoes turned upwards during the fifties. This reversal was due to the introduction of highly processed potatoes.

The general increase in demand for potatoes has been accompanied by the need for potato processing companies to hold potato inventories. This requires hedging or shifting of risk of possible price change for potatoes while they are in storage awaiting processing.

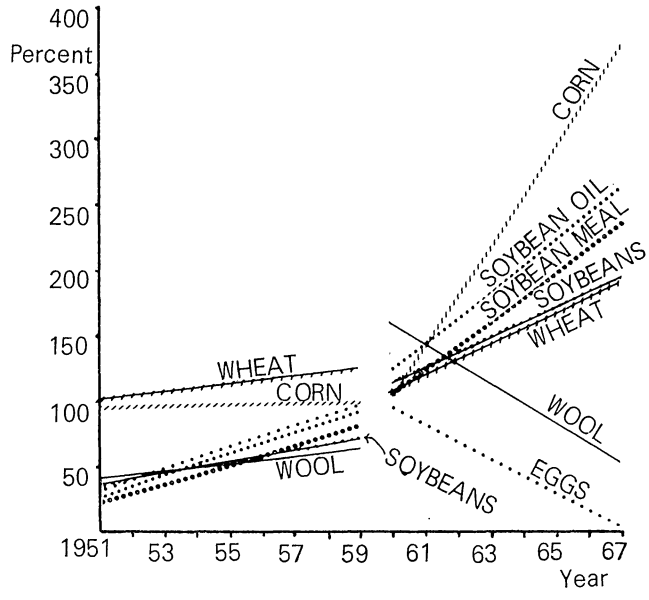

Figure 3. Trends in index of total open futures trading: selected commodities.

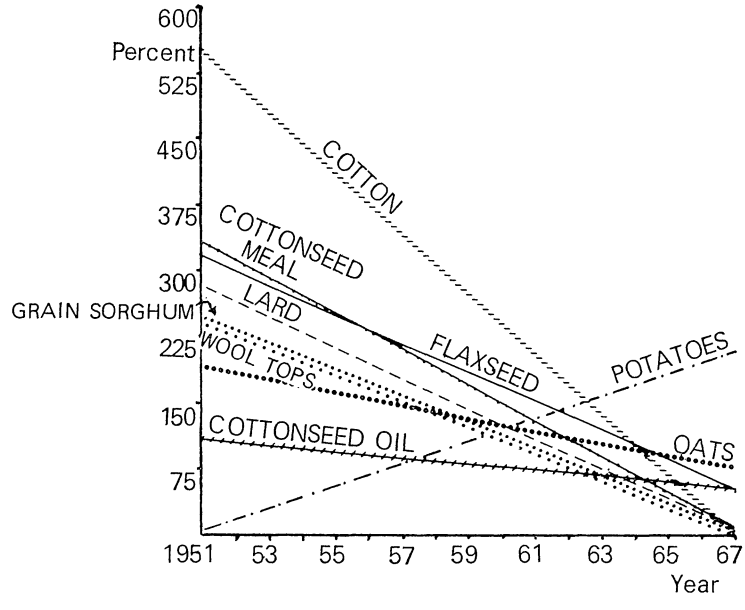

Figure 4. Trends in index of total open futures trading: selected commodities.

Eggs are another example. The production-marketing system for eggs has changed substantially over the last 20 years, eliminating major wholesaling and storing activities. The evening-out of production over time permits egg producers to deal more directly with retail outlets, eliminating the need for storage facilities.

Demand Structure

Still another explanatory factor woven into the trends is **change in the intermediate or final demand for the product.** For example, substantial increases in the export sales of soybeans, corn, and wheat through commercial outlets has encouraged an increase in futures market activity. On the other hand, where products such as lard have met decreased per capita demand, futures trading has declined. Meanwhile, total lard production has diminished, making it less necessary for stock holdings to be hedged. Both conditions have led to declines in futures trading.

Most of the trend increases and decreases for the 17 commodities can be explained through policy factors or supply or demand structure changes.

THE FUTURE

Recent studies provide some basis for making judgments about the future economic environment as it affects futures marketing. These studies include the report of the National Commission on Food and Fiber,[3] the National Commission on Food Marketing,[4] and several studies involving future consumption and production estimates for different commodities.

[3] *Food and Fiber for the Future*, Report of the Commission on Food and Fiber, July 1962.

[4] *Food From Farmer to Consumer*, Report of the National Commission on Food Marketing, June 1966.

Specialization of production units. Assuming that production units continue to become more specialized and less diversified in future years, more risk, requiring protection from price change, will face livestock and crop producers. This condition probably will expand hedging interest in the future.

Size of production units. Accompanying increased specialization, most livestock and crop units are expected to continue to increase in size. This increase will cause the risk associated with price changes to have a greater total impact on the firm. Also, as firms increase in size, the alternative of shifting risk by means of the futures market is likely to become more economically feasible relative to alternative ways of shifting it. Such alternatives include averaging losses and returns or creating a strong credit line.

Coordination of production and processing units. In an effort to obtain more effective coordination in the market, there probably will be increased use of contractual arrangements. This increase will cause risk to be assumed more by the processors if they are, as is likely, the contractors. They may look more favorably on futures markets as a means of reducing risk. It also might be argued that as contractual arrangements displace multimarket flows of products, more long and short positions will need to be taken in an effort to satisfy cash market contract commitments.

Ownership integration may have the opposite effect by decreasing the amount of futures activity because of a reduced need for inventory holding at processing stages where markets have been eliminated through ownership integration. The net effect is expected to favor expanded futures trading activity.

Distribution of production. Besides changes in specialization and increases in size of production units, production facilities within the United States may become more centralized geographically than has been true in the past. To the extent that this is true, more facilities will be needed in geographically central locations and more transportation will be called for. As these factors become reality, more futures trading will be needed.

Change in agricultural policy. Current developments in agricultural policy formulation indicate a trend towards lower and more variable price supports and more storage facilities owned and operated by private capital. As previously shown, these changes are expected to increase the use of futures contracts in an effort to hedge for risk aversion.

The level of understanding. Management skills are expected to increase markedly in the future, and these skills will include improved knowledge concerning futures trading. If the futures markets are effective management tools for people, the use of futures markets will expand as more people realize they can shift some of the risk of price change.

(continued on page 4)

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IN PERSPECTIVE

Agricultural Economics Publications

As a special service to readers of the *Minnesota Agricultural Economist* (MAE), future issues will include on a regular basis a listing of new publications authored by members of the Department of Agricultural Economics.

The publications listed will cover the complete range of topics of concern to the agricultural economics profession, including farm management, production economics, agribusiness, marketing, international trade, agricultural prices and policy, foreign economic development, land and resource economics, regional economics, local government and related subjects. Since publications vary in both style and orientation, the brief descriptions that follow will aid in choosing publications for specific purposes.

The departmental series includes:

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Economic Information Reports present information drawn from a variety of sources.

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Agricultural Experiment Station publications include:

Station Bulletins are semi-popular reports of specific research projects.

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The most current listing of recently published items by department members is Economic Study Report R-68-7, *List of Faculty Speeches and Publications in Agricultural Economics, April 1967-July 1968.*

The most current publications are:

The Returns to Investment in Agricultural Research in the United States. P-69-5. Willis Peterson.

Economic Aspects of the Organization of Agricultural Research. P-69-6. Robert Evenson.

Planning for Pollution Control. P-69-7. R. W. Snyder.

Dummy Variables and the Statistical Efficiency of the Estimators. P-69-8. M. A. Soliman.

Processing Costs in Butter-Nonfat Dry Milk Plants. Station Bulletin 491. J. William Hanlon and E. Fred Koller.

The Impact of Milk Holding on Midwestern Markets. Station Bulletin 493. Martin K. Christiansen.

Direct requests for departmental publications to: Department of Agricultural Economics, 212 Haecker Hall, University of Minnesota, St. Paul, Minnesota 55101. Send requests for extension and experiment station publications to: Bulletin Room, 3 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55101.

Futures Trading . . . cont'd from page 3

Contract specification. More specific futures contracts will be developed in the marketing system. They will more accurately reflect market supplies and demands. So the use of futures markets will increase as an increased number of improved contracts are traded.

Distribution of population. As population continues to increase disproportionately by regions (more people in coastal areas), increased transportation from production areas to consumption areas will be required. Needs for facilities at population centers thus will increase. With increased transportation and more facilities available, more hedging will become necessary.

Foreign trade. An additional factor influencing the future volume of futures trading will be the continued expansion of foreign demand and foreign trade. If they continue to expand, more facilities will be needed and more hedging activity will occur to protect inventories being stored and transported to meet these market demands.

SUMMARY

Most indicators of the character of the future economic environment suggest a greater volume of futures trading. Within this context, not only will certain markets increase substantially in terms of future activity, but there will be continued opportunity for both new finished products and farm inputs to enter into futures trading channels.

The potential seems good for new commodities to break into the futures market, considering the less stringent conditions of entry outlined above. But the success of new entrants depends on many factors affecting the general activity of futures trading.

Transmitting information on futures markets to producers, businessmen, and traders remains a problem. Educational programs must be expanded to inform potential users of the strengths and weaknesses of this management tool. ■

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101.

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