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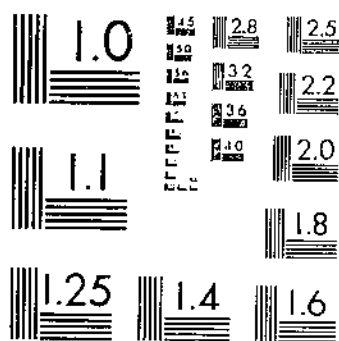
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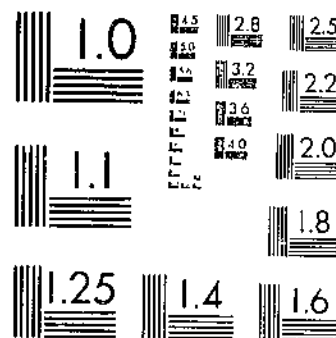
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TREATMENT OF HEDGING IN COMMODITY MARKET REGULATION  
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# TREATMENT OF HEDGING IN COMMODITY MARKET REGULATION

*Allen B. Paul*

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ECONOMIC RESEARCH SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE

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### ABSTRACT

The study analyzes the reasons for defining bona fide hedging for regulatory purposes, deficiencies of the current legal definitions, means for sidestepping the need to define hedging, how these means might work in practice, some problems posed thereby, and possible theoretical and practical bases for improved definitions.

**KEYWORDS:** Futures trading, commodity regulation, hedging, speculation, futures contracts, commodity exchanges, margin deposits, speculative limits, Commodity Futures Trading Commission, Commodity Exchange Authority.

## PREFACE

This report is an outgrowth of a study conducted by the author in response to a request by the Administrator of the Commodity Exchange Authority (CEA) for a reexamination of the definition of hedging. The request was part of a general Government inquiry into commodity market regulation under the 1936 Commodity Exchange Act, as amended. Such inquiry resulted, during November 1974, in passage of the Commodity Futures Trading Commission Act of 1974, a comprehensive revision of the 1936 Act. One of the significant changes was to delete language defining bona fide hedging and, instead, to direct the newly created Commodity Futures Trading Commission, which replaces the CEA, to define hedging.

This report attempts to bring together the points at issue in the definition of hedging and the economic considerations underlying their interpretation and resolution. On the basis of various evidence and judgements, some courses of action are recommended.

The author has had discussions with many people associated with commodity futures trading. The views presented here are those of the author and may or may not reflect the views of others. In any case, this report should be regarded as a vehicle for elevating the general level of understanding, narrowing the areas for useful debate, and determining where further research could clarify points at issue.

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## SUMMARY

Regulation of commodity markets should avoid, where possible, classifying trading into the categories of "speculating" and "hedging." These terms represent only the polar positions of a large continuum. Most business uses of futures trading are combinations of speculative and hedging elements. Hence, classification of commitments into one or the other category often is arbitrary.

The need to define hedging for regulatory purposes arose following passage of the Commodity Exchange Act of 1936. The legislation provided for the imposition of limits on how many long or short commodity futures contracts could be held or traded by any one individual. However, bona fide hedges were exempted from such limits.

The rationale for limits is to prevent sudden, unreasonable or unwarranted changes in price. There are two general types of price aberration. One type is the fluctuation of futures prices—often in cycles—without economic cause. This aberration probably is caused by deficiencies in the information system or by mass psychology. It is not clear how trading and position limits can correct this. Certainly, such limits do not prevent more people from entering the market. There is a need to study how such price fluctuations are fed by defects in the information system and the various measures that could correct these defects.

The other type of price aberration is caused by exercise of manipulative power. This takes various forms. Some manipulative power can be moderated by limiting both the volume of trading and the size of positions. Daily trading limits constrain the concentration of buying or selling within the day and could moderate sudden changes in price. Such limits should be applied to all traders irrespective of how they may be classified. Ways of making trading limits more efficient should be studied.

The orderly buildup of large individual futures positions over several trading sessions should not be limited except when necessary to ensure orderly liquidation of such positions before the contract expires. Large futures positions not carried into the delivery month are no more manipulative than large cash positions. Indeed, if entered on the short side, such futures positions could be counter-manipulative.

Perhaps the most important manipulative power exercised in futures markets is the delivery month squeeze—a phenomenon often precipitated by hedgers rather than speculators. A squeeze can occur because there are costs of making or taking delivery on futures. Excessive settlements by delivery could cause the price for maturing futures to go above or below its normal relation to cash prices. When delivery costs are large, distortions

can be large. Prices may differ by much more than normal costs of delivery if squeezers control a substantial share of the deliverable supply.

Futures delivery rules should be examined for ways to lessen squeeze potentials. Par delivery specifications and provision for substitute delivery often can be improved. In particular, the possible use of substitute delivery with discounts and premiums that are in line with competitive values in cash trading should be examined. This requires accurate reporting of cash prices, a condition that frequently is not met. Careful study should be given to the possibilities for improvement.

Realization of the squeeze potential of a futures contract may be lessened by judicious use of position limits. The critical matter is to properly limit positions by every trader during the delivery month. The limits should be tied to deliverable supplies and should be varied by commodity, season and time of year. The size of positions that may be held prior to the delivery month should be constrained only by the need to reduce such positions in an orderly way to the size permitted at the start of the delivery period.

Presumably, formulas could be developed to replace present flat limits with tapering limits. For most traders, this would allow much larger futures positions, except during the delivery month. Consequently, the need to distinguish between hedging and speculative positions would be lessened. Such liberalization of positions limits likely would accommodate the needs of all but the very largest users of futures. The commodity exchanges probably would have to adopt margin rules that would safeguard the integrity of contracts, as the size of positions increases.

For firms who wish to exceed these general position limits, hedging should be defined in terms of strict economic criteria. Such definition is not used today although some concessions in this direction recently have been made. Rather, the treatment of hedging is an outgrowth of provisions in the original Act that require the holding of an equal and opposite position in "the same cash commodity," where the same cash commodity has been interpreted to refer to physical form apart from time or place. Yet commodities that are physically the same may have unrelated locations or times of delivery.

Thus, under current regulation some firms might be exempted from position limits when offsetting a physically, but not economically, related commodity in futures, while other firms, dealing in economically similar commodities, are not exempted because the cash and futures commodities are physically different. For example,



corn held abroad and subject to trade barriers can be hedged in corn futures. On the other hand, domestic sorghum, barley, and other feeds ordinarily cannot be hedged in corn futures.

The need is for an economic criterion of commodity sameness—using correspondence of price behavior as a proxy for the correspondence of the expected degree of profit and loss sustained in cash and futures positions for a given commodity. Statistical measures of correspondence could be applied in each situation for which the special exemption is sought and the results compared with measures for others that are granted. The amount of futures allowed to offset a cash position may be less than a one-for-one depending upon how closely the cash and futures commodities are related.

The number of requests for hedging exemptions to come before the Commodity Futures Trading Commission probably would be relatively small. Firms seeking new types of exemptions should be required to provide the necessary data to show that the economic criterion of commodity sameness is met. The Commission could be as liberal as the economic criteria and oversight requirements would allow.

Beyond these problems of proper matching, the

Commodity Exchange Act has allowed other hedging exemptions from position limits—principally the “anticipatory hedging” of raw material requirements by processors, and futures sales of anticipated output by farmers. These exemptions are questionable except when it can be shown that the futures positions are offsets to the equivalent of fixed-price cash commitments. In practice, such exemptions appear to be little used. The liberalization of position limits as proposed here probably would meet almost everyone’s needs.

Spreading among futures contracts has been treated as a form of speculation and subject to position limits. However, large-scale spreading, in its economic essentials, can occur in the ordinary conduct of hedging by the switching of hedge positions among different futures contracts, and by hedging on a gross rather than net basis. Because spreading is a desirable economic activity, its various usages should be made more equitable.

Hedging privileges can be abused in practice. Such abuse can be mitigated with certain safeguards. There is a need to reexamine explicit requirements for concurrent execution of cash and futures transactions, orderly trading, filing of relevant data, audit procedures, and related matters.

# TREATMENT OF HEDGING IN COMMODITY MARKET REGULATION

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## 1. INTRODUCTION

Hedging is accorded special treatment in commodity futures trading in two distinct ways. First, it is exempted from position and trading limits imposed by the Federal Government and, generally, by the respective boards of trade or other commodity exchanges. Second, the exchanges usually require that higher minimum margins be deposited by traders for speculative positions than for hedge positions. This report examines the first topic in depth in order to clarify the issues and suggest how to improve the treatment of hedging. The second topic is examined only insofar as it bears on the first.

A background discussion follows on the nature and use of position and trading limits; the definition of hedging; and the role of margin deposits.

### Position and Trading Limits

To prevent sudden, unreasonable or unwarranted changes in price, Federal regulations permit the imposition of limits on the volume of trades that a trader may make in one day as well as on the number of open futures contracts he may hold (hereafter, open futures contracts are referred to interchangeably as "open commitments," "open interest," and "open contracts"). The language of the Commodity Futures Trading Commission Act of 1974 (20, pp. 54-55) provides authority for imposing limits as follows:<sup>1</sup>

Excessive speculation in any commodity under contracts of sale of such commodity for future delivery made on or subject to the rules of contract markets causing sudden or unreasonable fluctuations or

unwarranted changes in the price of such commodity, is an undue and unnecessary burden on interstate commerce in such commodity. For the purpose of diminishing, eliminating, or preventing such burden, the Commission shall, from time to time, after due notice and opportunity for hearing, by order, proclaim and fix such limits on the amount of trading which may be done or positions which may be held by any person under contracts of sale of such commodity for future delivery on or subject to the rules of any contract market as the Commission finds are necessary to diminish, eliminate, or prevent such burden. In determining whether any person has exceeded such limits, the positions held and trading done by any persons directly or indirectly controlled by such person shall be included with the positions held and trading done by such person; and further, such limits upon positions and trading shall apply to positions held by, and trading done by, two or more persons acting pursuant to an expressed or implied agreement or understanding, the same as if the positions were held by, or the trading were done by, a single person. Nothing in this section shall be construed to prohibit the Commission from fixing different trading or position limits for different commodities, markets, futures, or delivery months, or different trading limits for buying and selling operations, or different limits for the purposes of subparagraphs 2 (A) and (B) of this section, or from exempting transactions normally known to the trade as "spreads" or "straddles" or "arbitrage"

<sup>1</sup>Numbers in parentheses refer to references listed at the end of this report.

or from fixing limits applying to such transactions or positions different from limits fixed for other transactions or positions.

Limits have been established for wheat, corn, oats, soybeans, cotton, shell eggs, and potatoes, as well as for some commodities for which trading has become inactive. The Commodity Futures Trading Commission can impose position and trading limits on other commodities if, after study and hearings, it deems this to be in the public interest.<sup>2</sup> With the recent application of futures trading to livestock and citrus products and in view of the new legislative authority over previously unregulated commodities (such as coffee, sugar, cocoa, copper, silver, and plywood), there is a great deal of interest in exemptions from possible new limits that may be imposed.

Limits imposed by exchanges may be the same as or different from those of Government. Where no Government limits exist, the exchange limits apply. A 1968 amendment to the Commodity Exchange Act gives the Government authority to require an exchange to enforce its own rules regarding terms and conditions of contracts and trading requirements. Hence, exchange limits can have the force of Government authority.

A paradox, to be examined later, is that some exchanges restrict individual hedge positions, whereas the Government has always exempted hedging from its position and trading limits.

#### Definition of Hedging

Bona fide hedging was first defined in Federal legislation in 1936, when the Commodity Exchange Act specified classes of transactions or positions that would be exempt from any limits imposed by the Commodity Exchange Commission. Hedging was essentially defined as sales of, or short positions in (purchases of, or long positions in), any commodity for future delivery if these transactions were offset, in terms of quantity, by ownership or fixed-price purchases (sales) of the same cash commodity.

Certain types of hedging were specified then, and in subsequent changes in the Act and in administrative rulings. Most notable is the "anticipatory hedge" defined in a 1956 amendment. Thenceforward, processors and manufacturers

could count as hedges their purchases of commodity futures to meet unfilled, anticipated requirements for the season. By substituting long futures positions for unnecessarily early acquisition of inventory, processors and manufacturers would be better able to establish input prices before entering into fixed-price sales commitments for their produce.

The language of the Commodity Exchange Act as amended, prior to 1974 (17, p. 4), provided for exemptions from position and trading limits as follows:

No order issued under paragraph (1) of this section shall apply to transactions or positions which are shown to be bona fide hedging transactions or positions. For the purposes of determining the bona fide hedging transactions or positions of any person under this paragraph (3), they shall mean sales of, or short positions in, any commodity for future delivery on or subject to the rules of any contract market made or held by such person to the extent that such sales or short positions are offset in quantity by the ownership or purchase of the same cash commodity by the same person or, conversely, purchases of, or long positions in, any commodity for future delivery on or subject to the rules of any contract market made or held by such person to the extent that such purchases or long positions are offset by sales of the same cash commodity by the same person. There shall be included in the amount of any commodity which may be hedged by any person—(A) the amount of such commodity such person is raising, or in good faith intends or expects to raise, within the next twelve months, on land (in the United States or its Territories) which such person owns or leases; (B) an amount of such commodity the sale of which for future delivery would be a reasonable hedge against the products or byproducts of such commodity owned or purchased by such person, or the purchase of which for future delivery would be a reasonable hedge against the sale of any product or byproduct of such commodity by such person; (C) an amount of such commodity the purchase of which for future delivery shall not exceed such person's unfilled anticipated requirements for processing or manufacturing during a specified operating period not in excess of one year. Provided, That such purchase is made and liquidated in an orderly manner and in accordance with sound commercial

<sup>2</sup>Before the Commodity Futures Trading Commission Act of 1974 (20) took effect, this authority was vested in the Commodity Exchange Commission, which consisted of the Secretary of Agriculture, the Secretary of Commerce, and the Attorney General, or any person to whom each might have lawfully delegated authority to have acted in his stead.

practice in conformity with such regulations as the Secretary of Agriculture may prescribe.

In 1968, cattle feeders and other producers of livestock and poultry were exempted from limits on long futures positions in corn and other feed grains taken to cover unfilled needs for their feeding operations. In 1973, hybrid seed corn firms were allowed to classify as hedges the purchase of corn futures in anticipation of later fixing the price to be paid to hybrid seed growers. Such transactions were permitted only on a bushel-for-bushel basis.

In March 1975, an amended definition of hedging was issued. It brought the 1968 livestock feeding exemption under the definition of hedging and extended it to cover soybean meal and feed grains. The amendment permits bakers to hedge unfilled annual flour requirements in wheat futures, and it allows users of dry corn milling products to hedge their unfilled annual requirements in corn futures. Seed corn processors are allowed to hedge the "bushel value equivalent" of their unfilled annual requirements in corn futures and not just the actual number of bushels to be processed; sweet corn processors are accorded the same privilege. Also, the amendment permits, for the first time, the classification of short positions in soybean oil and meal futures as hedges against stocks and fixed-price purchases of soybeans.

These recent changes are in the direction of liberalizing hedging exemptions from position and trading limits. They are precedents for still further liberalization of the definition of hedging. Where should such liberalization stop? The new definitions were issued under section 404 of the Commodity Futures Trading Commission Act of 1974 and will remain in force until the Commission issues its own hedging definitions, as provided under section 4a(3) of the Act.

### Margin Deposits

Because a futures contract involves deferred action of both buyer and seller, the basic reason for margin deposits is to assure performance.

The original margin rule, enacted by the Chicago Board of Trade in 1865, allowed each member of the Board to call another for up to 10 percent of the value of the article bought or sold to him on the day such margin was demanded. Also, it allowed either party to call the other for further margin under adverse price movements; and, if this margin was not provided, the caller could consider the contract filled at the market value on the day of the call and the difference between market value and contract price settled the same as though the contract had fully expired (16).

The 1865 rule, in effect, created the now familiar instruments of initial margin deposit, maintenance margin, and right of liquidation in case of failure to provide adequate margin. Over the years, these features of margin deposits have been incorporated into a sophisticated system for guaranteeing the integrity of futures contracts, with the modern clearinghouse organization at the core. In brief, the clearinghouse, which guarantees all futures contracts, looks to its members for margin deposits and, in turn, these members look to their customers for margin deposits. The clearinghouse rules prescribe minimum margins required of its members; the exchange rules prescribe margins that all futures brokerage houses must require of their customers.

Because credit risks attached to hedging are considered less hazardous than credit risks attached to speculation, the exchanges sometimes allow futures brokers to take lower margin deposits on hedges. That is to say, losses that might be sustained by a customer from one day to the next are thought to be less on hedging than on speculating in futures because differences between cash and futures prices change less from day to day than do the futures price levels. This supposition is based on conditions that may or may not hold.<sup>3</sup>

Some brokerage houses demand margins that are higher than exchange minimums. Because low margin requirements are a way of holding customers, too loose an interpretation of what constitutes bona fide hedging conceivably could weaken the integrity of the system. There may be some positions classified as hedges that should not be so classified. Account executives in brokerage houses who derive their main income from commission fees may have an incentive to classify trade-related accounts as hedges in order to attract more business.

There is no Government regulation of margins, although some have been proposed from time to time on grounds such as curbing excessive price fluctuation, controlling the aggregate amount of credit outstanding, and protecting persons of limited means against their own speculative impulses (14). Few would question the need for margins to guarantee the integrity of a contract, and only on this ground will questions about margins be evaluated.

### Sequence of Argument

The uses of the terms "speculation" and "hedging" are varied and often complex. As popular terms, they usually represent only polar positions and thus can be misleading because there is in fact

<sup>3</sup>See chs. 2 and 9 for discussion of these conditions.

a large continuum between the two (ch. 2). For regulatory purposes, it would be advisable to search for ways to sidestep the need to distinguish between the two concepts.

Our search starts with an examination of the nature and causes of price distortions that occur in futures trading (ch. 3). Cash-futures price distortions in the delivery month seem particularly troublesome. Most of these distortions result from particular rules of futures trading (chs. 4 and 5), which might be redesigned to lessen squeeze potentials. The most constructive step would be to revise contract terms to bring financial settlements during the delivery month as close as possible into line with commercial values. Among other things, success here depends on having tolerably good reporting of cash prices—a condition that is not always attained (ch. 6).

## 2. HEDGING AS AN ECONOMIC CONCEPT

The more the concept of hedging is examined, the more it becomes evident that the term is used with many different shades of meaning. Although hedging can be sharply defined for specific purposes, no single definition meets everyone's needs. The only feature that is common to all hedging in commodity futures is that such transactions or positions are somehow related to business needs.

This is why Working decided to define hedging as "the use of futures contracts as a temporary substitute for a merchandising contract without specifying the purpose" (23, p. 432). He proceeded to list several categories of hedging, but noted that hedging is sometimes closely akin to speculation and indeed, "If speculation is defined in accordance with ordinary usage of the term, hedging and speculation in futures are always indistinguishable" (23, p. 443).

Arthur (1) examined the various ways that modern business firms use futures trading and settled on the idea that hedging consists of isolating that part of a cash commitment that is an "analogous part" of some futures commitment and then, by taking an opposite position in futures, the business firm would be left with "residuals." Residuals are the vehicle of earning basis profits.

A more rigorous theoretical treatment of hedging is made possible by the mean-variance approach pioneered by Johnson (7). He noted that an essential feature of commodity hedging is that the trader synchronizes his activities in two markets, the cash or spot market and the futures market (7, p. 139). Mean-variance analysis provides a rather elegant means for analyzing risk and return in futures trading along the same lines that have been used in stock portfolio analysis. In further pursuing the mean-variance approach, Ward

A further step to mitigate squeezes would be to impose more efficient and less onerous limits on futures positions. Such limits would be more liberal earlier in the life of the futures contract, and more restrictive during the delivery month, than are the current flat limits. Ideally, they should apply to all traders, irrespective of how positions might be classified (ch. 7). But before liberalizing position limits, it would be advisable to evaluate the implications for exacerbating forced liquidations in times of market instability and to suggest the possible precautions to be taken (ch. 8).

It would appear that the above approach to regulation would avoid the need to define hedging in most cases. Yet, if hedging must be defined for regulatory purposes, it can be done more equitably than now by adhering more closely to economic criteria (chs. 9 and 10).

and Fletcher (22) have demonstrated that a continuum exists between hedging and speculation.

McKinnon (10) examined optimal hedging by farmers who grow crops having uncertain yields. He concluded "that (a) the greater output variability is relative to price variability the smaller will be the optimal forward sale, and (b) the more highly negatively correlated are price and output the smaller will be the optimum forward sale."

Using mean-variance analysis, Heifner (4) analyzed extensive data to determine hedging potentials in grain storage and livestock feeding for various locations, grades and/or classes of wheat, corn, oats, cattle, and hogs—commodities for which output uncertainty usually is minimal. He found that in routine hedging, the firm would normally optimize its position by offsetting a cash commitment with some lesser quantity of futures. In the cases examined, the optimal quantity was found to range between 0.6 and 1.0 units of futures per unit of cash commodity; and at the optimal level, between one-third and two-thirds of the price risk could have been shifted in this manner. Put another way, it is riskier from a business viewpoint to be completely hedged in the conventional sense than to be incompletely hedged at some level.

Under some circumstances, hedging as a one-to-one offset of a cash commitment in futures could increase rather than decrease the firm's exposure to loss. Severe losses could be sustained if there were limitations on the supply of services to handle, store, and transport the commodity, such as occurred for grain in the summer of 1973 and fall of 1975. Losses also could be sustained if cash commitments hedged in futures called for payment in a foreign currency whose value then changed

adversely, relative to the dollar, unless the trader had an effective hedge in the forward exchange market. Incidents of this nature have no doubt occurred in the last few years of international monetary disturbances. Thus, expected performance of conventional hedging of commodities rests on assumptions that may not always hold.

In sum, economic theory does not provide criteria for categorizing each individual position as hedging or speculation. While in principle one can assess the degree of hedging and the degree of speculation in each position, in practice this appears quite difficult. Moreover, the degree of

hedging or speculation in a futures position may have little or no significance for certain regulatory purposes. For example, the fact that a firm's positions are largely hedges may not prevent it from manipulating prices during the delivery month.

Hence, the initial direction for our inquiry should be a search for the causes of market aberrations and market failure; then we should develop rules and regulations to best cope with these—leaving open the possibility that certain business uses of futures, however conventional they look, should be brought under effective control along with nonbusiness uses.

### 3. CONSTRAINTS TO LIMIT PRICE DISTORTIONS

While the concept of price distortion seems readily understandable, it is not easy to define. The concept denotes situations in which price behavior is seen to be caused by conditions or events in the market that are undesirable but avoidable.

For purposes of discussion, futures price aberrations of interest can be divided into within-the-day futures price distortions and longer term futures price distortions. Within these time frames, distortions of cash-futures spreads and futures-futures spreads are of particular interest.

The central task is to identify the most appropriate way of mitigating each type of price aberration. In particular, it is important to determine whether there might be effective general constraints that could be applied to hedgers and speculators alike, thus avoiding or greatly lessening the need for granting hedging exemptions.

#### Within-the-Day Futures Price Distortions

Because futures trading is a highly sensitive market instrument, futures prices can change rapidly in a short time, especially in thin markets. Concentration of buying or selling can move prices up or down in a violent way. This concentrated trading can also distort the spreads between prices for different delivery months. Traders, if left free to follow their own devices, may at times "slug the market" with heavy purchases, which would later be followed by heavy sales (or vice versa). Or, they may put large spreads between futures months and later "unwind" these. Because such trades do not result in positions at the end of the day, they need not be margined. Currently, there is no convenient way to determine if traders exceed position limits during the trading day. In practice, some clearing members who are responsible for the contracts of day traders have understandings that constrain the day trader (14). But where these understandings do not prevail, there may be problems.

To prevent concentrated buying or selling activity from distorting prices, both the Government regulating agency and the commodity exchanges impose limits on the daily volume of individual traders. Were there a better monitoring mechanism, it would be possible to meter the rate of trading over shorter periods. Conceivably, there could be a volume limit per hour. For example, is the current 3-million-bushel daily volume limit on corn for a 3½-hour trading session more effective in controlling price distortion than a 1-million-bushel limit per hour—or a total of 3.75 million bushels per day? Would this type of metering, applied to all trading in corn futures, interfere with the legitimate needs of hedgers, spreaders, and day traders? It should be possible, if better surveillance mechanisms were used (18), to study this matter in depth as a basis for appraising the merits or demerits of these or other types of rules as applied to different commodity situations.

#### Longer Term Futures Price Distortions

If individual speculative positions in futures were adequately margined and if daily volume limits were enforced, it is not immediately clear why positions should be held to certain levels. For example, why not raise individual position limits on corn to some multiple of the daily trading limits? (This matter is examined in ch. 7).

Lerner (8) argued that competitive speculation is socially useful whereas manipulative speculation is socially harmful. He labeled the former "speculation" and the latter "Speculation." In this context, for example, it is difficult to justify existing position limits of 2 million bushels on wheat and 3 million bushels on corn and soybeans. Such amounts usually are a very small fraction of commercial stocks. Further, there are no constraints, apart from access to capital, on the size of cash positions that may be accumulated. Then why not

remove all speculative position limits from futures trading? There are two possible reasons for not doing this.

1. One is that the very ease with which the machinery of futures trading permits capital to enter the commodity market might exaggerate the tendency for market psychology to cause cycles in price movements.

The basic problem is the tendency for many people to believe that if prices have been rising, they most likely will continue to rise (and vice versa). The belief becomes the father of the event. Hicks (6) recognized this phenomenon in analyzing the causes of trade cycles and examined the "elasticity of expectations." This elasticity would be positive if a price rise led traders to expect a further price rise. It would be 1.0 if a given rise in price created an expectation that prices would continue to go up at the same rate. It could be greater or less than 1.0; or it could be negative if current price increases created an expectation of declining prices. Heilbroner (5) claimed that a positive elasticity of expectations is a frequent condition of markets in the short run.

Along these lines, fears have been expressed that if position limits on futures trading were raised appreciably, the professionally managed trading pools that tend to follow a common "trading plan" would have undesirable effects on price movements. Trading plans often are built on the behavior of prices in the market (rather than on economic fundamentals). Hence, such plans rest on market psychology.

Indepth study is needed to appraise the influence of trading plans. How true is it that trading decisions conform to some common "trading plan"? How would daily trading limits affect the ability of a fund manager to follow a trading plan on a substantial scale? What evidence of cycles is there in present market price movements, and can they be linked to particular traders' activities? It should be possible with improved surveillance machinery to get the necessary information with which to base decisions on whether to liberalize position limits on this count.<sup>1</sup>

2. The second reason for maintaining position limits is to prevent a build-up of excessive

commodity claims that must be liquidated in the delivery month. Positions can become excessive in relation to deliverable supplies of the commodity. Liquidation pressures under such conditions may cause distortion of the price of maturing futures in relation to other futures, and, as discussed below, to cash prices.

### Distortions of Cash-Futures Spreads

Differences between cash and futures prices are market-determined prices for services to transform a commodity in time, place, or form. Firms tend to specialize by types of services they render (for example, growing, assembling, transporting, warehousing, processing, or merchandizing). Futures are commonly used to sell these services.<sup>2</sup> Such specialization and concomitant use of futures have increased with the general expansion of the economy and growth of markets.

The distortion of cash-futures spreads could pose a serious problem for businessmen. Modern business has been developed on the principle of specialized production, and this necessarily implies large-scale operations, low unit costs, and low operating margins. Distorted price spreads interfere with better methods of production and further increases in efficiency.

Could such distortions be mitigated by appropriate actions? One route is to improve the terms of contract so as to reduce the potential for distortions—a subject discussed in chapter 6. Another is to limit open positions during the delivery month.

Government and commodity exchange constraints apply to size of individual trader positions and not to the aggregate of open positions. Although individual trading may not violate position limits, the total outstanding contracts might prove excessive in relation to deliverable supplies. The result may be "market congestion" and a rise in price for maturing futures. Under aggravated conditions, trading in the maturing contract may be allowed "for liquidation only"—a sort of after-the-fact admission that total open positions were allowed to get too big. To develop better constraints would require fuller information on deliverable supplies—that is, the uncommitted stocks that can be moved into position for delivery within

<sup>1</sup>At present, there is no good way of knowing who does what to futures prices. Trading is largely carried out anonymously through intermediaries, hence it is difficult and costly to trace market positions. A recent study (18) proposed a comprehensive plan for harnessing modern computer technology to collect, collate, retrieve, and utilize the mass of detailed data arising from futures trading—which data would include individual trader identification and time-stamping of trades. Were this capability installed, it would be possible among other things to study how professionally managed pools behave, and the bearing of such behavior on prices.

<sup>2</sup>This seems to be understood by many businessmen who grow, transport, store, merchandise, and process commodities and who use forward markets in the ordinary conduct of their business. In fact, a special trade jargon is used to focus on cash-futures price differences as market-determined entities, e.g. "fluctuations in the basis." But the economic literature on the subject is deficient. Two case studies (11, 12) show the nature of the problem.

the remaining time available until the final delivery date.<sup>6</sup>

The limits on individual positions by Government and commodity exchanges differ in one important respect. Government regulation places no limit on size of an individual's bona fide hedge positions, whereas some exchanges do. For example, the Chicago Mercantile Exchange allows a hedger of live cattle (and certain other commodities) to exceed the speculative limit, but he must not exceed a particular limit that is assigned him for short positions. In fact, hedgers have been required to reduce their short positions to 300 contracts (the speculation limit) by the first notice day. An even more stringent condition: no exemption from the speculative limits seems to be accorded to long hedges.

Why are the rules of Government affecting hedgers less stringent in these cases than the rules of the Exchange? Here is a plausible conjecture: The Exchange has come to recognize through experience the harm that unlimited hedge positions can cause and, being quite innovative, has modified its rules in attempting to deal with the problem. In the case of the Government, rules were written into Federal law as if they were based on the dictum that hedging cannot significantly affect commodity prices. Bona fide hedging implies that for each sale, there is an offsetting purchase in the same commodity—hence, the price-decreasing

effect of selling would offset the price-increasing effect of buying. The level of price for the commodity would be largely unaffected.

This reasoning seems plausible, but it is incomplete and therefore can be misleading. For one thing, it assumes simultaneous purchase and sale. In practice, firms frequently delay executing hedge sales in futures against cash purchases to a time when conditions appear more favorable. It may be a day, a week, or longer. When the hedge sale is executed, it tends to depress the price of futures by about the same amount as the earlier purchase had tended to raise cash prices. Such action can hardly be distinguished from speculative purchases and sales.

Moreover, the reasoning ignores the importance of competitively determined price differences. Meaningful prices in commodity markets are established by price differences as well as by price levels. Profits can be made by manipulating differences as well as levels, and the former may be easier to accomplish.

As stated before, cash-futures price spreads are market-determined prices for the provision of services to transform a commodity in time, place, or form. What appears as a small percentage error in commodity price levels often means a large percentage error in price differences. One needs to explore by what means and by what amount bona fide hedgers can distort prices.

#### 4. PRICING ABERRATIONS DURING THE DELIVERY MONTH

All commodity futures contracts permit some pricing imprecisions during the close-out of trading because costs of making and taking delivery cannot be avoided. Usually a trader who has a short position (hereafter called a "short") who delivers in fulfillment of his futures contract bears the added costs of inspection, handling, storage, safeguarding, and record transfers. Usually a trader with a long position (hereafter called a "long") who accepts delivery must make full payment by certified check. Also, the latter must sell,

move, or otherwise dispose of unwanted grades or locations of the commodity. These unavoidable costs to seller and buyer form a zone in which future prices can fluctuate independently of cash prices as positions are liquidated through offset.

##### Large Delivery Costs

A substantial increase in delivery costs could greatly widen the zone in which futures prices can fluctuate independently of f.o.b. cash prices. For shorts, there could be increased costs for procuring and transporting more supplies from an abnormal distance to satisfy demands for delivery. Or, commodity lots having grades that are under-valued by the futures contract might have to be delivered when properly valued grades are unavailable. For perishables, there could be much uncertainty over the outcome of official inspections due to congestion at delivery points, possible deterioration of quality, and so on. Faced with such contingencies, some shorts may be willing to "buy in" their futures positions at higher prices than would other-

<sup>6</sup>Deliverable supplies are not some fixed quantity; rather, they change with circumstances and are particularly sensitive to price. Conceptually, the deliverable supplies of a commodity for a particular futures contract that exist on a given date are a function of (a) the price premium for the futures contract above cash prices for spot delivery of the commodity at various locations, (b) the cost of moving such stocks into deliverable positions, (c) the quantity of uncommitted stocks at each location, and (d) the time needed to move commodities into position by available modes of transport. Thus, deliverable supplies form a schedule of quantities. The research task is to marshal the relevant data and test alternative econometric models that capture the plausible relationships.



wise prevail in order to avoid what they perceive as greater disadvantages.

Alternatively, the longs could be put at a severe disadvantage by the exercise of certain sellers' options. The longs may have to accept and dispose of more commodity lots with unwanted grades or in unfavorable locations than originally anticipated. In particular, disposing of non-par deliveries that were over valued by the futures contract could cause large losses. Against such contingencies, some longs may "run from the delivery"—that is, sell out their futures positions at a price lower than would otherwise develop. For convenience, this action hereafter will be called a "short squeeze."

These abnormal delivery costs form a substantial manipulative zone. It has been referred to as "the zone of inaccurate response" by Will Clayton (3) in his account of the pricing aberrations under the New York cotton contract before southern delivery points were added.

In most cases, neither seller nor buyer stands to gain by exercising his delivery rights; usually each would prefer to liquidate his positions through offsetting transactions. Yet, the very existence of positive delivery costs creates some degree of squeeze potential which might be exercised by a dominant buyer or seller, or by a number of buyers or sellers acting in unison.

#### Hedgers as Squeezers

For many years, the dangers of "corners and squeezes" were thought to lie almost exclusively with the concentration of large speculative lines in a few hands. History is replete with such attempts at cornering and squeezing—some successful, some unsuccessful, but all disruptive. Such attempts are possible today—particularly when there is a paucity of "free stocks" near the end of the storage year, a condition which calls for some Federal constraints.

But what is not understood by people who are not close observers of futures trading is the development in recent decades of the much more pervasive "hedge squeeze," to which many commodity futures contracts are prone. Some firms, through plan or opportunity, force the futures price above (or below) comparable cash prices by an amount equal to the costs to the opposite party of making (or taking) delivery. One result is an increase in deliveries. But this may be no more than part of a strategy in which other futures contracts held by the hedger are liquidated or offset at prices he is able to dictate to opposite parties who wish to avoid the greater costs of taking or making delivery.

In the last days or weeks of trading, futures price movements may be such that differences

between futures and cash prices are substantially greater or less than normal. During this period, futures price movements may also reverse directions, depending on the changing composition of open interest, the disposition of the uncommitted supplies eligible for delivery, and the formation of trading coalitions that permit one side of the market to gain the upperhand.

The point is that there are times when some hedgers—usually firms that deal in the particular commodity grades and locations deliverable on futures—that are well situated to precipitate the delivery month squeeze on the long or short side. Others—be they hedgers, futures spreaders, professional speculators, or the speculative public—are not equally well situated. The costs to the former group of making or taking delivery is appreciably less than the costs to the latter group. The former have more knowledge of market conditions and opportunities; they can treat as sunk costs what the latter must treat as variable costs; and they usually can finance their commitments with greater facility.

Some of the other traders might stay in the market in the hopes of cashing in on the anticipated hedge squeeze—possibly thereby facilitating it. But if they are wrong, the outcome of their gambles could prove rather costly. Furthermore, not all traders who make delivery when futures prices are depressed, or who take delivery when futures prices are inflated, stand to profit like those who do the squeezing—although such actions help the latter's cause. Imperfections of cash markets may make delivery on futures a reasonable alternative for some firms—e.g., they would get a certified check for delivery on futures instead of delayed payment for cash sales; they may need to unload surplus stocks in a way not to arouse the suspicions of regular customers that they are in a weak bargaining position; and so on. Thus, imperfections of cash markets are seen as imperfections of futures markets.

#### Business Uses of the Hedge Squeeze

Profits may accrue to a business firm from precipitating a long squeeze. Firms holding long positions into the delivery month may gain by selling out most positions at inflated prices to shorts who feel threatened with demands for delivery. Thus, the business firm could maintain most of its hedged position by switching to a later futures month those maturing positions that were not closed-out by delivery. Or, if the firm wished to increase its stocks, the gains from a long squeeze in futures could be used to outbid rivals making cash offers for stocks. In any case, the squeeze would tend to raise the price of the expiring futures

more than it would raise cash prices. The essential relations are shown in figure 1.

In contrast to the actions in a long squeeze, the hedger who precipitates a *short* squeeze could plan to buy-in a goodly share of his short positions at depressed prices. Anyone holding large short positions in the expiring future, plus stocks of the deliverable commodity, might threaten longs with enough deliveries (by certifying stocks and initiating some deliveries) to cause longs to sell out their future positions at depressed prices.

The hedged position—the very thing that enables the firm to enlarge its holding of commodity stocks beyond the level its own means would ordinarily justify—might be largely maintained by switching its remaining short positions to a later month. Or if the firm chooses to reduce its commodity stocks through cash sales, a short squeeze in futures could give it a competitive advantage because the squeeze would depress futures prices more than it would depress cash prices at different locations. That is, gains realized on the short squeeze could be used to shade cash prices in order to get customers.<sup>7</sup> These price relationships could be charted in a manner analogous to figure 1.

#### Effects of Squeezes

The hedge squeeze is a sort of levy that some parties can impose on others by virtue of their market position. Some people may regard it as a cost of doing business. It appears to be one of the

most pervasive market forces and one that could weaken the institution of futures trading.

Is this concern exaggerated? It is true that many enlightened market users liquidate their market positions before the first notice day. Good brokers will similarly guide the unenlightened out of maturing contracts. Traders who choose to stay the course are few, and if their credit is adequate they presumably should be willing to accept the full economic consequences.

This argument hardly disposes of the matter. The price effects of a hedge squeeze might be felt by many others well in advance of the final days of trading. Although the price distortions ordinarily would be smaller than the dramatic price changes in the last few days of trading, they could be more widely felt. Further, some business firms have a legitimate need to maintain hedge positions beyond the first notice day. This is especially true of firms dealing in perishables because there is no close tie between prices of futures for successive delivery months. (It may be the reason, for example, why a large share of open positions in the live cattle futures usually have been carried into the delivery month.) A similar situation may exist for semiperishable and storable commodities in the last old-crop futures.

Most important, the very integrity of futures trading may be at stake. If pricing aberrations become large or frequent, they tend to erode confidence in the equitability of markets and to undermine public acceptance and private use. Accurate assessment of economic conditions is of little value if prices move in response to squeezes.

### 5. ANATOMY OF A SQUEEZE

Pricing imprecisions during the delivery month can be considered "abnormal" if one side is able to exploit the other. These imprecisions can be categorized by observing cash-future price differences for various delivery periods and relating these differences to the quantities delivered on the futures contract.

#### Price Differences Within a Normal Zone

When the squeeze potential remains unexploited, the relationship between the futures and cash prices during the closing period of trading would be dictated by the added costs of making and

taking future deliveries under normal conditions, as discussed in chapter 4. Neither the longs nor shorts would get the upperhand; observed price differences would tend to fluctuate narrowly around a given level. Deliveries on the contract would be small. This condition is illustrated by the pattern of dots in panel A-1 of figure 2.<sup>8</sup>

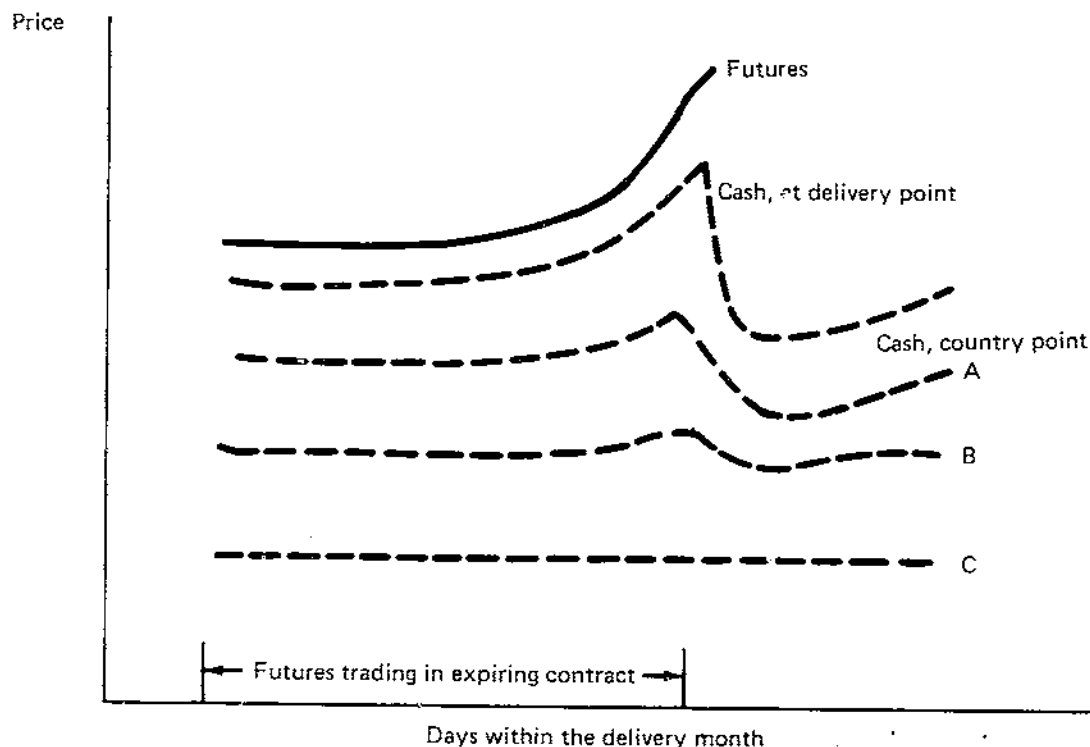
Or, the futures price might locate toward the upper or lower bounds of the normal cost zone—as shown in panel A-2. The dots are separated into two distinct dispersions. Either the longs or the shorts have achieved the upperhand—i.e., either the longs have forced the shorts to buy-in their outstanding contracts at a premium to avoid higher

<sup>7</sup>Moreover, a collateral advantage could accrue from the short squeeze. By depressing the futures price, the firm may create the opportunity to settle, on a more favorable basis, cash purchase agreements tied by formula to the maturing futures contract.

<sup>8</sup>For ease of exposition, the normal zone is shown with well-defined boundaries. But in practice, such zones fall within less definite boundaries which might be expressed more appropriately in probability terms. Yet, this correction would not alter the essential idea.

Figure 1.

## MODEL OF PRICE BEHAVIOR DURING A LONG SQUEEZE

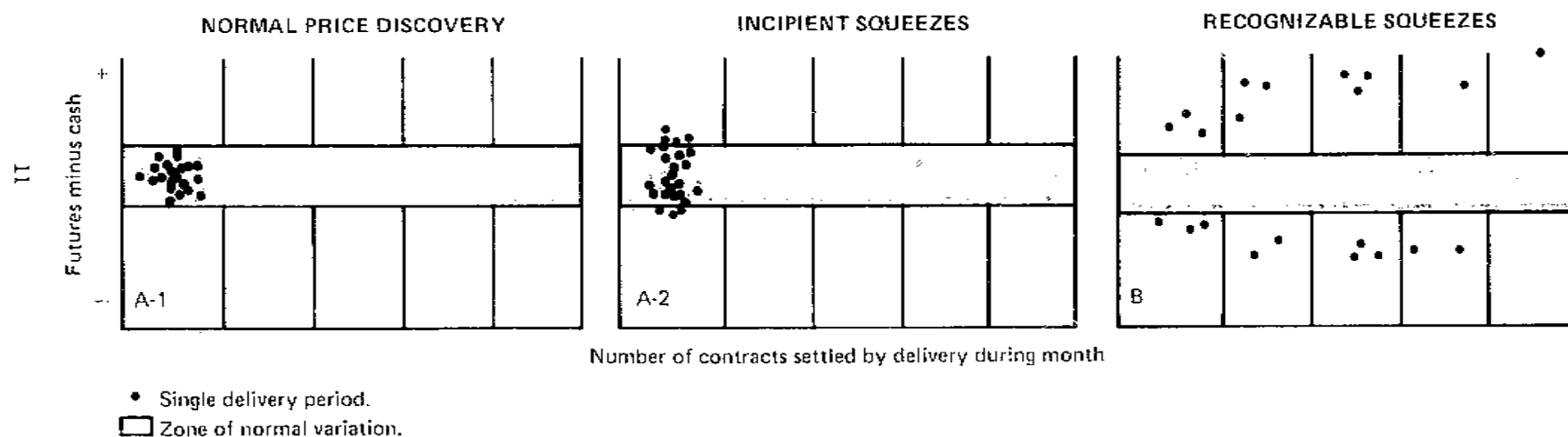


A run-up of the maturing futures price, until the close of trading, is associated with a similar run-up of cash prices for spot delivery at different locations, but by lesser amounts as the distance to the futures par delivery point increases. For convenience, the level of cash prices is shown to be lower with increases in distance—an assumption that need not hold. Also for simplicity, each price is smoothed to abstract from minor fluctuations. The cash price at or near the futures delivery point is shown collapsing right after the close of trading in the futures, to reflect accumulation of unwanted grain at the delivery point—which would signify a loss to squeezers that would need to be subtracted from their gains from selling-out most of their maturing contracts at a profit. But whether a collapse of cash prices would actually occur would largely depend on the squeezer's ability to hold such grain off the market.

A similar chart could be drawn for each of the other two commodity dimensions, namely the prices for different grades of the commodity, and the prices for different forward delivery dates (one form of this is the family of prices for futures contracts for different months). In other words, there is a three-dimensional price surface for each commodity. This surface could be considered for each day to show changing price relationships in three dimensions as the squeeze goes through its various stages.

Figure 2.

# PATTERNS OF PRICE DIFFERENCES IN THE FINAL WEEK OF TRADING IN A COMMODITY



costs of making delivery, or the shorts have forced the longs to sell-out their contracts at a discount to avoid higher costs of taking delivery. The threat of delivery is strengthened by an increase in actual deliveries, although the added increment could be small and imperceptible.

### Abnormal Pricing

An enlargement of the delivery month squeeze would be reflected in price differences that lie outside the normal zone; the squeeze would become clearly perceptible when it causes deliveries to increase to the point where extra costs are incurred for acquiring (or disposing of) larger stocks. This situation is shown in panel B (fig. 2).

The price distortions caused by long and short squeezes need not be symmetrical (i.e., mirror-images). The level and shape of such price aberrations would depend on the particular costs of delivery that longs or shorts seek to avoid. It seems likely that for both long and short squeezes, the price distortion would tend to flatten out in the face of larger deliveries—at least for initial batches—because the threshold costs of reaching out to bring in a new supply (or effect further disposal) will have been breached. Ultimately, for the long squeeze, the price differences might again be perceptibly higher as more costly sources of supply were required to settle contracts.

### Practical Cases

Unequivocal evidence that a squeeze has occurred is hindered by the paucity of good information on the price of the commodity in corresponding cash transactions. But when a squeeze breaks out of its incipient range and becomes flagrant, the reasons for cash and futures price differences are less uncertain. Moreover, the Government can command the relevant cash price information from traders who are under investigation.

Also, except for perishables, comparisons always can be drawn between prices for the maturing and for subsequent futures contract months. Sudden changes in such price relationships near the close of trading in a contract would suggest that purposeful squeezes had occurred. A purposeful squeeze need not be planned in advance. A firm may suddenly discover that circumstances have thrust it into a manipulative position which it decides to exploit. However, where patterns of price distortion have become frequent, it suggests that some firms may enter the market with expectations of gain from recurring opportunities to squeeze.

Squeeze potentials arise from various circumstances; some avoidable and some unavoidable. Cotton and the grains have a long history of futures trading that shows how contract terms can get out of line with shifts in the underlying structure of production and trade. Contract grades and locations may become less representative of the commercial supply and, hence, less can be economically delivered on futures. Such contracts become more susceptible to squeezes.

Faced with this condition, some firms, particularly the more substantial merchants, carry stocks in deliverable positions expressly to "protect their hedges"—i.e., to prevent the longs from squeezing them when hedges are lifted. However, these very stocks also might be used by the shorts to squeeze the longs—i.e., they might depress the maturing futures price by threatening the longs with delivery of commodities at locations or with grades for which there is no good commercial use.

In the case of the semiperishable crop, such as potatoes (or onions before trading was banned), a squeeze condition tends to arise toward the end of the storage season if stocks are unexpectedly depleted or if the new crop is unexpectedly delayed. In the case of a perishable commodity such as fed steers, stocks usually are plentiful, but they tend to go directly from country feedlots to packing plants rather than to terminal yards. If there were large demands for futures delivery, more cattle would have to be moved to the terminals at otherwise avoidable expense. In the case of a manufactured product, such as frozen concentrated orange juice, there are relatively few manufacturers, and the bulk concentrate is largely used by them in further processing. Thus, an outsider either as a short or long would face an imperfect cash market in which to acquire or dispose of bulk juice as a result of his futures operations.

The above are examples of a longer list that includes regulated and heretofore unregulated commodities. Probably few, if any, futures contracts are wholly immune from squeezes. Some are more susceptible than others because of structural or technical circumstances. Some are more susceptible because of restrictive contract terms. And some are more susceptible simply because they are minor commodities, requiring less capital to control an appreciable share of the available supplies.

While squeeze potentials probably cannot be completely eliminated without eliminating futures trading itself, they probably can be lessened. One route is to improve contract terms. Another is to limit the size of positions in maturing futures contracts.

## 6. CONTRACT TERMS

Amending contract terms is the most desirable way to avoid placing tighter limits on positions in order to counter squeezes. But developing improved terms is a difficult task. It requires insight into basic economic relationships in a commodity market in order to anticipate the consequences of using different delivery points, classes and grades, rights of substitution and compensation, and other contract terms. In practice, much of the progress seems to have been made by trial and error.

Over the years, much has been said on this subject, especially by members of an exchange after it had become evident that something was indeed wrong with a particular contract. But systematic analyses appear infrequently in the literature. Powers' (13) retrospective study of pork belly contracts and Sandor's (15) study of the development of plywood futures reveal types of insights that are needed. There undoubtedly are many unpublished analyses that underlie decisions to adopt new contracts. The study of contract terms will receive increasing attention because Federal law can now require the exchanges to revise their futures contracts to prevent or lessen manipulation, congestion, or abnormal commodity movement. Specifically, the Commodity Futures Trading Commission Act of 1974 says that contract markets shall:

... permit the delivery of any commodity, on contracts of sale thereof for futures delivery, of such grade or grades, at such point or points and at such quality and locational price differentials as will tend to prevent or diminish price manipulation, market congestion, or the abnormal movement of such commodity in interstate commerce. If the Commission after investigation finds that the rules and regulations adopted by a contract market permitting delivery of any commodity on contracts of sale thereof for futures delivery, do not accomplish the objectives of this subsection, then the Commission shall notify the contract market of its finding and afford the contract market an opportunity to make appropriate changes in such rules and regulations. If the contract market within seventy-five days of such notification fails to make the changes which in the opinion of the Commission are necessary to accomplish the objectives of this subsection, then the Commission after granting the contract market an opportunity to be heard, may change or supplement such rules and regulations of the contract market to achieve the above objectives . . . (20, p. 33).

This is not a place to add to the literature on the subject except to clarify one important matter. It arises out of the suggestion, to be explored in the following chapter, that position limits should not be flat but should be tapered over the life of the contract. If adopted, the proposal would mean that the maximum position of traders would be reduced as the delivery month approaches—a situation that would seem to infringe upon a trader's right to obtain delivery on contracts freely entered into. This raises a fundamental issue.

### Reinterpreting the Right of Delivery

Beyond purely legal considerations, most students of futures trading believe that the right to make or take delivery must be safeguarded to ensure that cash and futures prices are kept in line. Otherwise, businessmen would become disinterested in using futures for hedging purposes.

This argument is incomplete; it fails to take into account that the same result might be achieved by financial settlements at contract maturity. Bakken (2) was on track of the solution. He argued, following Justice Holmes' famous 1905 Supreme Court opinion, that the legal effect of delivery on futures is secured just as well by offset as by actual delivery. Hence, futures trading should not require delivery, only proper financial settlements. But he did not show how to do this.

The truth is that the right of delivery is only a means to assure that one's economic position is maintained. The short is required only to deliver enough money to the long so that the long may acquire the commodity at the time of settlement, and for which he would pay the short the original contract price. For example, what difference would it make were one to receive warehouse receipts for wheat tendered by the short, or a sum of money equal to the current cost of buying warehouse receipts for the same kind and location of wheat? The central problem, of course, is to find a way to determine the proper financial settlement, which requires methods of identifying true commercial values of the contract grade at contract locations. Failure to establish such values would mean that the right of delivery on futures would indeed require actual delivery.

### Partial Financial Settlements

Partial financial settlements are implied whenever deliveries on futures are not made with par grades or at par locations. The proper determination of discounts and premiums for substitute delivery is a special case of the more general problem involving complete financial settlements.

The typical solution to this problem is to provide fixed discounts and premiums (called "fixed differences"). But fixed differences—no matter how accurately they once reflected differences in cash trading—tend to get out of line. As a result, financial settlements for substitute delivery are often inequitable, the futures contract tends to be discounted for fear of having to take delivery of substitute lots that will be overvalued by the contract, and traders are inclined to shy away from such contracts altogether.

Why not value substitutes at the time of delivery on the basis of current competitive values in cash markets? An historical example of this is the New York cotton contract. After New York City was no longer an important commercial cotton center, the contract was broadened to include deliveries at southern points, at par. These delivery points were mostly port locations, where cotton for export was of about equal worth. The problem was how to value the various grades and staple lengths of cotton that could be delivered. The solution that evolved was to set the premium above or discount below the value of the par grade and staple length, as reflected by prices in a recent period in designated spot markets.

For example, just following World War II, the contract grade was "Middling, 15/16 inch cotton." Delivery of substitute grades at Gulf points was permitted at the average of the differentials at Dallas, Galveston, New Orleans, and Memphis on a designated business day prior to the day of delivery. Substitute delivery at Atlantic ports was permitted at the average of differentials at Atlanta, Augusta, Charleston, Montgomery, and Memphis on a designated business day prior to the day of delivery.

The cotton contract seemed to work well for many years despite some problems. It ultimately fell into disuse when Government price supports dominated the cotton market. But with the reappearance of free markets, it has become apparent that the great structural shifts in the cotton industry since World War II have depleted the number of active spot markets on which equitable financial settlements could be based.

But the principles have proven to be sound and they may have wider application. For example, for live cattle, futures and cash prices have not always converged during the final week of trading. The reason for this is the difficulty of reflecting competitive values for substitute locations and qualities. However, financial adjustments could be made based on a cross section of current cash prices. Thus, for deliveries at non-par locations, the adjustment would reflect only the *abnormal* relationship between cash prices at the par location and at other locations. For example, the

reading might be taken as an average for the week immediately preceding the delivery of the cattle.

For substitute weights and grades of animals, similar compensation to the longs might be made when there is "concealed dumping" of Good grade or overweight steers on the futures contract. In 1974, for example, an unusually large number of heavy animals were included in futures deliveries because such cattle were worth less in cash outlets than in futures. To avoid this, unusual price differences in cash transactions for the various grades and weights at the time of delivery could be determined and then included in futures settlements.

Similarly, the grain markets might benefit from such machinery. For instance, the great growth of corn and soybean marketings since World War II has been accompanied by a dispersion of locations for which cash transactions are established. Values for any one location might be susceptible to distortion. If a terminal center were made the par delivery point on futures, the terminal would be out-of-position for most of the commercial grain supply; futures prices then could be distorted by the added costs of making and taking delivery at the terminal. A potential solution is to enter financial corrections into the settlement of corn and soybean futures contracts delivered at a few substitute locations, using an average of current cash prices at a larger number of related grain locations. Such possibilities require detailed study of locational economics, competitive conditions, and price reporting in the grain industry.

### Complete Financial Settlements

The problem of achieving complete financial settlement of maturing contracts, in lieu of delivery, should be explored. There is much room for imaginative thought. A landmark case is the recent revision of the broiler contract, illustrating how the Exchange has invented a financial settlement that, apart from how it fares for broilers, may have fruitful application to other commodities.

Before the contract was revised, a short fulfilled delivery of broilers by tendering a "shipping certificate." A long could use this claim to acquire broilers delivered to the Chicago area or he could sell the certificates. But many potential longs were not in a good position either to use broilers or to find buyers who could use them. Hence, the value of the contract to the longs tended to become depressed by the cost of finding buyers.

To meet this problem, the Chicago Board of Trade revised the contract to give the long the right, within a 24-hour period, to resell certificates to the tenderer thereof, at the weighted average cash price quoted by the USDA for Grade A poultry delivered into the Chicago area the fol-

lowing week. This amounts to a complete financial settlement based on reported commercial values. The key to such settlement is a reliable cash price.

Also, there is a general historical precedent. In the absence of having a formula based on objective cash price reports, complete financial settlements often were based on a *committee judgment* of commercial values. In practice, the committee scheme has been used frequently to settle defaulted contracts. For example, in 1921, the Chicago Board of Trade adopted a rule that required payment on default of the "true commercial value," which was defined as "value in other established markets, or for manufacturing or consumption purposes in this country, together with such facts as may justly enter into a determination of its value." In addition, a penalty was assessed (19, p. 253).

With modern techniques, it now should be possible to greatly improve the machinery for determining true commercial values throughout the market. The need is to improve the coverage, relevance, timeliness, and reliability of cash price information. Once there is good cash price reporting for a commodity, it should be possible to design financial settlements by formula, based on

such price reports. There are many ways to do this. The aim would be to settle offsets made during the delivery period with financial compensations based upon the degree to which cash price differences for the contract grade at the different locations have departed from recent norms.

To repeat, the key to the use of formulas in the settlement of futures commitments is having good cash prices to work with—good here meaning largely unmanipulated and tolerably well-reported. Studies of cash price reporting in relation to the needs of futures contracts are needed to arrive at a reasonable judgment about the practical possibilities of adapting contracts along these lines. Further development of the USDA cash reporting system and other reporting systems may be needed where they are judged to be inadequate for these and other purposes.

The above suggestion applies only to commodity situations in which there are substantial cash transactions of a competitive nature to be reported—as in grain and livestock markets, among others. Where there are no substantial cash transactions, or where they occur at administered prices, this route to contract improvement is irrelevant.

## 7. POSITION LIMITS

As discussed in chapter 2, there are two major reasons for imposing limits on futures positions. One is to lessen the tendency for market psychology to cause cycle-like movements in prices. The other is to lessen the tendency for large positions carried into the delivery month to cause pricing aberrations during the final period of liquidation.

A third reason some think important is to prevent other manipulative effects. But futures position limits cannot themselves do much to prevent a trader who has the financial capacity from influencing the price of a commodity, because no limitations are placed on the size of his cash positions. Futures claims and cash claims are interchangeable, and are tied together, price wise, by the right of delivery. Thus, limitation of futures speculative positions is an uncertain way to prevent undue influence of large traders on the level of commodity prices. Moreover, a limitation of futures speculative positions could act perversely—namely, it could deter the buildup of short positions to counter unwarranted price increases. Hence, only the first two objectives will be examined here.

### Flat Limits

Flat limits on futures positions are a positive way of preventing a buildup of large individual

positions on either side of the market. But they cannot forestall entrance of more traders. Hence, it is not clear that such limits can prevent or even moderate price cycles. Further study of this issue is warranted, particularly of the frequency of price cycles in the different futures contracts, their nature, duration, and causes.<sup>9</sup> Only after such study has been made can one assess with confidence the merit of adjusting position limits for this purpose.

Position limits can indeed lessen pricing aberrations in the delivery month. But a flat limit on speculative positions over the entire life of a futures contract is a crude and inefficient device. There is no reason for excluding hedge positions as discussed at length in previous chapters. Moreover, there is no warrant for using flat limits, as will be discussed here.

If a flat limit were tied to market conditions at the start of the delivery month, it would unnecessarily restrict use of the market earlier in the life of the contract. But if the limit were set correctly for earlier periods, it would be too liberal at the start of delivery. Moreover, for seasonally produced commodities, the limit should be varied by delivery month in line with changes in normal stock levels.

<sup>9</sup>See (9) for a recent study examining such price phenomena.



Also, a flat limit, if correct for the beginning of the delivery month, may be excessive for the last few days of trading when deliverable supplies may be scarce. This suggests the need to taper the permissible limit during the liquidation period to a point where there are relatively few outstanding contracts to be settled by delivery near the close of trading.

### Tapering Limits

What principles should govern the permissible size of positions? The effect that the size of futures positions has on price behavior is not clear. Perhaps the rate of change in positions is more relevant. There are few scientific studies on these subjects. But useful research is possible and, in time, could throw light on the issue. What is eminently clear, however, is the need for keeping futures positions from exceeding limits that could be reduced in an orderly way.

The need for orderly liquidation of a trader's positions at any time during the life of a contract may be analyzed in terms of (a) a *threshold limit* for each futures contract, at the start of its delivery period, (b) an *expansion factor* allowing for larger positions for each additional month a contract is away from the start of its delivery period, and (c) a *daily trading limit* which, together with the expansion factor, determines the permissible addition to the threshold limit each month, for each contract. These will be discussed.

It seems inefficient to set the same threshold limit on each of the contracts for a seasonally produced commodity. For example, if the present 3-million-bushel position limit as applied to May corn were indeed appropriate at the start of May, it probably would be too restrictive for December or March corn at the start of their respective delivery periods, and too liberal for July or September corn at the start of their respective delivery periods. The reason is that corn is harvested in the fall and storage stocks decrease as the new harvest approaches. Hence, the potential supply for delivery on futures also tends to decrease.

Thus, the market usually is more squeezable toward the end of the storage year than near the start. Presumably, there should be a sliding scale of limits assigned to the different contracts according to their position within the storage season. Some recognition is now given to this principle by the exchanges that set position limits on potatoes, pork bellies, and boneless beef.

For purposes of argument, assume that in normal years the appropriate limits on corn for the start of the delivery period were for December, 5.0 million bushels; for March, 4.0; for May, 3.0; for July, 2.0; for September, 1.5. Such limits could be relaxed earlier in the game, providing they could

be brought down in an orderly way to the threshold limit at the start of the delivery month.

Here is where the expansion factor and daily trading limit come into play. Conceivably, the present daily trading limit of 3 million bushels applied to every trader would permit a position to be 20 times larger 1 month removed from delivery than at the start of the delivery month, if there were 20 trading sessions in which to reduce the position. But such extreme liberalization is untenable. It would force the trader with a maximum open position to liquidate 3 million bushels each trading session, or not get his position down to size at the start of delivery. Such a rate of forced liquidation probably would put the trader at a disadvantage vis-a-vis other traders. And it could upset the market. More likely, the permissible increase in the limit, for each month removed from delivery, should be only a few times the daily trading limit for orderly liquidation. The optimum figure could be determined through experience.

But how efficient is a 3-million bushel *daily trading* limit? It was argued previously that imposition of an hourly trading limit would permit the daily trading limit to be larger than otherwise. In any case, the matter should be studied with care, commodity by commodity, including whether to vary the daily trading limit with seasonal hedging needs. Insight might be gained through a study of the buildup and liquidation rates of large hedgers in orderly markets.

### An Illustration

Assume that the threshold position limit for corn contracts were set as indicated above—namely, for December, 5.0 million bushels; for March, 4.0; for May, 3.0; for July, 2.0; and for September, 1.5. If all five corn contracts were traded on October 1, any trader would be permitted to be long or short 15.5 million bushels—i.e., the sum of the various threshold limits for each contract.

In addition, a trader would be allowed to increase his long or short position in direct proportion to the number of months to go before the delivery period would arrive. Assume that the present 3-million-bushel *daily trading limit* were in force and it were judged safe to increase commitments in the nearby futures, each month before the start of delivery, by *only twice* the daily trading limit. This would allow the trader about 20 trading sessions in the ensuing month to reduce his position by 6 million bushels. Experience might show that a factor of three or four were safe enough. But even a factor of two would have a substantial effect on the size of the permissible market position.

For example, the position limit for December corn on November 1 would be 11 million bushels

(2x3 million + 5 million); on October 1, 17 million bushels (4x3 million + 5 million); and so on, increasing by an increment of 6 million bushels for each month removed.

One remaining question is whether and how to set a limit on the *aggregate* size of a trader's position in all corn futures contracts. Obviously, enormous positions could be taken if, in addition to the threshold limit for each contract, the permissible increase in positions because of the distance of each contract to its maturity were allowed for all five contracts. It could permit a general inflation of futures claims that would have to be liquidated because they could not be successfully rolled-over into deferred futures. This could destabilize prices.

Therefore, an aggregate limit on the increase in size of positions, because of the time interval from maturity of contracts, should be no more than some fraction—e.g., one-third or one-half—the total that would have been permitted by the allowance for each contract entered separately. But, even with such a constraint, position limits for corn (and for other commodities) probably would be much larger than currently.

It would be hard to say, without more study, how far this degree of liberalization would accommodate hedgers' needs without exempting them from limits. It is likely that it would cover the needs of all but the largest hedgers. The treatment of very large hedging positions is not easy to resolve. While such positions should be limited during the delivery month like all other positions, limits in other months could cause problems for some firms. One possible way out of this dilemma is for large bona fide hedgers to register with the Commodity Futures Trading Commission, and then be exempted from limits other than in the delivery month for bona fide hedge positions. Reports would be required showing the offsetting cash transaction on the afternoon on which trading positions were exceeded. Alternatively, the Commission might assign special limits over the life of the contract, to such firms, as illustrated in figure 3.

A second question is how to reduce the position limits as the delivery month progresses toward the close of trading in such contracts. While various methods of tapering these limits could be proposed, it would be best if the taper were based on the amount of deliverable stocks. For example, assume that advance limits were set as discussed above, based on judgment and history. Then on the first notice day, a maximum position would be set for the beginning of the last day of trading—say, at one-tenth of stocks in deliverable position (on the first notice day) unless the owner was prepared to make or accept delivery. One-tenth could be added to this for each trading day removed from the last day up to the initial maximum. Short positions could of course be liquidated either by an offset or by making delivery. Delivery notices would not circulate. Instead, they would be held by the clearinghouse. Long positions could be liquidated by an offset or by an agreement to take deliveries as these became available. This would ensure that most deliveries went to those that wanted them. Orderly liquidation could also be required on the last day of trading—say one-half during the first three-fourths of the session and one-fourth before the last 15 minutes of trading.

#### The Problem of Perishables

The case of perishable products, like live animals, is somewhat different. Each contract month tends to reflect the value of an independent commodity. Thus, business commitments in futures tend to be held into the delivery period and these ordinarily cannot be "rolled over" to a deferred month, or into cash forward commitments, without appreciable loss in precision of hedging outcome. Exchanges dealing in perishables recognize the need to limit bona fide hedge positions to mitigate delivery month squeezes. As a result, they appear to be under particular pressure to reduce the potential for price distortion by frequently updating or otherwise redesigning the delivery terms.

## 8. CONTRACT SECURITY

If the suggestion of tapering positions limits were followed, it would allow the creation of large positions without reference to their classification as hedging or speculating. This raises the issue of the integrity of contracts. The issue need not be troublesome but it should not be ignored.

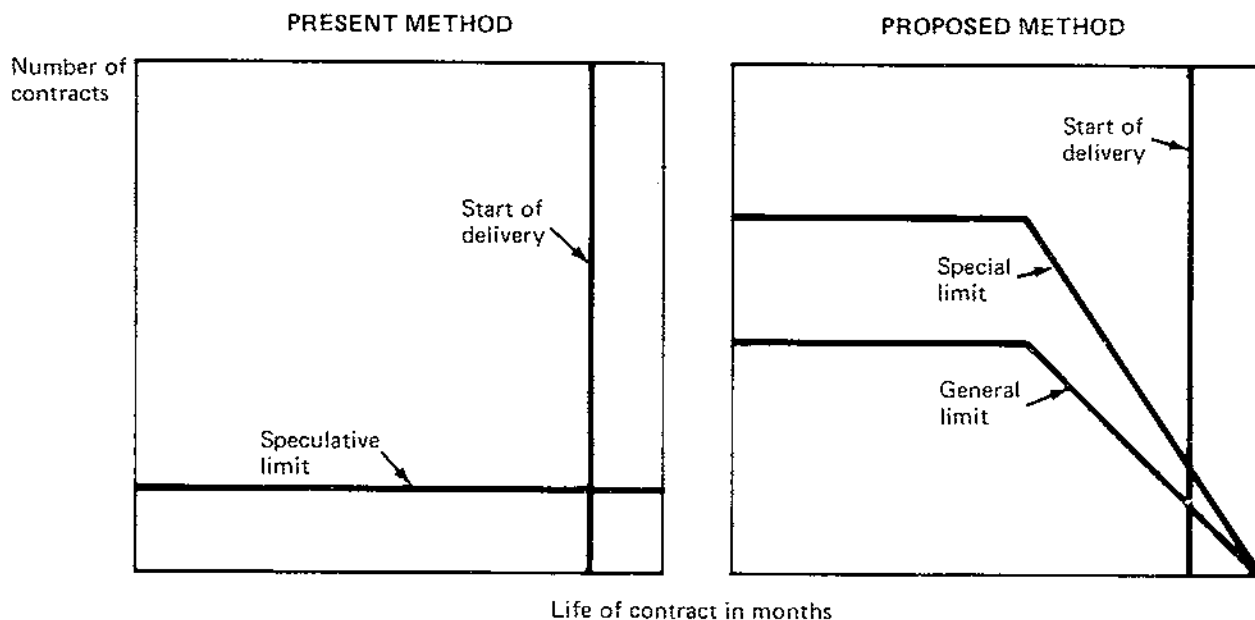
The responsibility for setting margin requirements, as always, has rested with the exchanges and their members. Federal control over margins has been sought from time to time, but seldom if

ever on the grounds of improving the security of futures contracts. Nor does the 1974 legislation give the Commodity Futures Trading Commission the authority to set margins. And there are no grounds for believing that such authority would be needed if position limits were liberalized. The history of contract security has been excellent.

Contract security means providing assurances that no buyer or seller will sustain a loss because of default by another party. Economy requires that

Figure 3.

# COMPARISON OF PRESENT AND PROPOSED METHOD OF SETTING POSITION LIMITS



Currently, a flat limit is set on the number of net positions that may be held by any trader over the entire life of a contract, as shown in the left panel. As proposed in the right panel, larger holdings would be permitted early in the life of the contract and this amount would be reduced to the threshold level at the start of the delivery month and then further reduced as the delivery month progresses. This general constraint would permit much wider business use of futures than now because of the difficulty of qualifying many business uses as bona fide hedges. Firms that have a need to exceed the general position limit could be assigned special limits based on strict economic criteria, which limits could be tapered in an orderly way to some threshold limit at the start of delivery. The level and the taper would depend on specific circumstances.

security of contract be achieved without unduly tying up funds of traders or their agents to guarantee credit. Security and economy are fundamental to organized futures trading—in fact, they are major reasons for its existence.

The integrity of the futures trading system is maintained by margin deposits, plus the right of brokers to liquidate customers' positions (and in turn, the right of clearinghouses to liquidate clearing members' positions) in the event that customers fail to deposit additional margins whenever performance on their contracts is threatened.

However, this system of security invites problems. In a period of unusually sharp price movements, brokers may find that the minimum initial margin deposits required by a commodity exchange are insufficient to cover the price movement. Some houses that compete for business by requiring only minimum margins from customers may become embarrassed by customer failure to put up additional margins as required. The house has no choice but to liquidate such positions.

The forced liquidation, if sufficiently widespread among brokerage houses, could add to short-period instability of price. Also, it could close trading early in the session if the daily price fluctuation limits were reached. This would give brokers the time to try to secure maintenance margins from other customers.

In periods of sharp price movements, some brokerage houses may become insolvent because margin calls from the clearinghouse corporation exceed the amounts they can get on their own margin calls to customers, plus their own funds. But the clearinghouse system has proven solid; failures of some brokerage houses have not pulled down the others whose credit line to customers has been more conservative.

In light of the tendency of the futures trading industry to keep initial margins as low as possible and bring the accounts to the market on a daily basis, one can see a rationale for the Federal rule of setting position limits equal to daily trading limits—a practice questioned in the previous chapter. It is that no customer's speculative position in futures should be permitted to be any larger than can be liquidated, if possible, in one day.

One must question, however, whether this solution to achieving contract safety is indeed a good one. Why not face the problem of proper credit

safeguards directly instead of through position and trading limits? If necessary, there could be a schedule of minimum margin requirements according to size of position. Thus, larger positions should require larger margins, except where there were reliable criteria for exempting traders from such requirements.

One might object to this rule on the grounds that the trader's entire portfolio, or balance sheet, should be used in determining his margin requirements. Most large users of futures may be better credit risks than most small users. But there are many practical difficulties, particularly in appraising the worth of assets and in laying claim to them to cover losses sustained on the futures account. The broker is liable for the customer's contracts and large losses may bankrupt the brokerage firm, as history teaches. Because the financial strength of the exchange clearinghouse corporation, which guarantees all futures contracts, is not much better than the combined financial strength of its members, the failure of several major brokerage houses could unduly strain the entire system.

Yet, certain assets in a trader's portfolio may be excellent collateral for securing the financial obligations assumed in commodity futures. These are the assets that pose few problems of correct appraisal in relation to sustainable losses in futures and, moreover, are pledgeable. They include, for traders with net short positions in a commodity futures, an amount of corresponding commodity stocks, growing crops, goods in process, or fixed-priced purchase commitments. For traders with net long positions in a commodity futures, the assets include the amount of money receivable by the trader under his fixed-priced sales commitments for the corresponding commodity. It is conceivable that other assets could be counted as collateral against obligations arising out of futures commitments, but it is not clear how this would be done and at what cost.

In brief, if position limits were greatly liberalized, there would be a need for more reliable standards by which brokers could evaluate customers' credit risks. In practice, some concept of hedging is used by brokers to identify collateral that would minimize credit risks attached to particular futures positions of a business firm. From this standpoint, how suitable is the current definition of bona fide hedging used in Government regulation?

## 9. BONA FIDE HEDGING

We have attempted to build a case for liberalizing position limits, except during the delivery month, in order to accommodate larger individual

futures positions than permitted under current regulation. This approach side-steps the need for deciding whether or not a given position qualifies

as a "bona fide hedge," a concept whose difficulties were outlined in chapter 2.

Now we face the need to define bona fide hedging for two reasons. First, any improvement in the legal definition would be a useful guide to futures brokers in setting margin requirements for their customers, as suggested in the previous chapter. This need would become all the more urgent were position limits greatly liberalized. Second, some merchants, warehousemen, processors, and others might need to have larger positions in some futures contracts than would be allowed even with more liberal limits. The number of firms and magnitude of excess positions that might be involved could be estimated by empirical studies.

The definition of hedging would be the same for either purpose. In setting margins, the trader's cash commodity claims are evaluated as the principal collateral against his obligations to fulfill his futures commitments. In granting exemptions from position limits, the "neutrality" of the trader's position in futures in respect to its price effects would be evaluated in terms of the economic similarity of the commodity bought (sold) in cash and sold (bought) in futures. These two criteria amount to nearly the same thing.

This is fortunate because it provides an acceptable means for defining hedging, for the purposes required. In evaluating the current legal definition of bona fide hedging, the main problem is to reduce the inequities and to curtail the potential size of some positions. For convenience, most cases of interest can be grouped into three categories, namely, the proper matching of cash and futures positions, special hedging exemptions, and spreading.

#### Proper Matching of Cash and Futures Positions

The current concept of bona fide hedging is based on a restricted view of the production process—namely, that production is defined solely by changes in the physical form of commodities. While this is not explicitly stated, it underlies the view that bona fide hedging in futures consists of holding an equal and opposite cash position in "the same cash commodity," with the same cash commodity referring exclusively to physical form apart from time or place. Hence, the value of the same cash commodity now recognized for purposes of exemption may behave independently of the value of the futures commodity because of unrelated locations (e.g., cash wheat held abroad) or unrelated time of delivery (e.g., old crop versus new crop when convenience yields run high). Thus, some firms might be exempted from position limits when offsetting an unrelated commodity in futures—because the commodities are *physically*

*the same*—while others are proscribed from doing so in *economically similar* commodities because the cash and futures commodities are physically different.

An indicated direction for improvement in the law is to adopt an economic rather than physical concept of commodity sameness—using the criterion of corresponding price behavior as measured by objective statistical tests and not physical sameness. Thus, for example, some cash barley or sorghum commitments might be regarded as reasonably hedgeable in corn futures and others not, according to location and time of delivery. For any trader, the proper test is whether, by appropriate evidence, the cash prices for barley or sorghum at the *indicated location for the indicated grade and over the indicated time interval* changed in consonance with changes in the price of corn futures. Presumably, statistical measures of the correspondence could be applied to each situation for which the hedging exemption is sought and the results compared with measures for those that are exempted.

In measuring the correspondence between cash and futures prices, care should be taken to use price differences rather than raw prices. For example, for daily prices the change in price from day to day (first differences) might be used to calculate the correlations. This procedure helps remove systematic components of variation and in most cases it bases the calculations on variations in potential hedging profits. To illustrate: it may be found that the correlation between cash price changes in No. 2 yellow grain sorghum at Kansas City and price changes in the nearby Chicago corn futures is .45, while the correlation between Dark Northern Spring wheat price changes at Minneapolis and the Chicago wheat futures price changes is only .40. Presently, hedging exemptions are not given for the former, but are given for the latter. Such correlation coefficients suggest that equal or possibly the reverse treatment would be more logical.

In considering alternative approaches to the measurement of correspondence between cash and futures prices, further research is needed to determine the appropriate statistic to use, the appropriate time periods to cover, and other specific criteria. Questions about the validity of classical parametric statistical techniques for analyses of short run price changes are discussed in Mann and Heifner (9). Use of nonparametric statistics based on ranks may be better.

Another illustration may be drawn from a commodity for which Federal position limits have not been applied. No one would know how far to grant exemptions for various classes and grades of cattle hedged in the choice steer futures contract without appropriate statistical tests. Should cows, bulls, or

heifers be allowed? Should the hedge be confined to that future which corresponds with the end of the feeding period, or is it appropriate to hedge in contracts maturing in prior or subsequent delivery periods?

Also, there is a problem of defining the quantitative sameness of the commodity wherever it is converted into two or more joint-products, or is made from two or more materials. For example, the bushel-equivalent quantities of both oil and meal should be matched against bushels of soybeans in proper ratio. Currently, only the bushel equivalent of flour is matched against a bushel of wheat, with no attention given to the mill-feed component. What should be done in the case of hedging feedlot operations? Should both feed and feeder cattle holdings be counted as a bundle against sales of fed cattle futures? Anyone who in late 1973 or early 1974 sold fed cattle futures against calves placed on feed, without fixing the price of feed required to turn calves into fed steers, would have courted financial disaster as a result of the subsequent increase in feed prices arising from poor yields in 1974.

One might measure the degree to which the prices of the commodity and one joint-product (or one material input) have moved together and compare this with other such measurements where hedging exemptions are believed to be warranted. In this respect, the issue is analogous to the matter of commodity sameness discussed above. If a satisfactory correspondence is not obtained, then the test should include two joint-products (or two material inputs). More than two items may have to be included before a satisfactory statistical relation would appear. Whatever the number, a particular set of joint-products (or material inputs) would define the bundle of commodity offsets for purposes of obtaining exemptions from position limits.

In some cases, no set of hedgeable commodities could be so identified—particularly where non-material inputs were relatively large and unstable in value. Such cases are not at once obvious; a sharp rise in commodity prices, such as occurred in 1973-74, could make some business operations eligible where they might not have been before.

After determining that the cash and futures commodities have been properly matched, there is a need to determine the ratio of the two positions that would constitute a hedged position. As Heifner (4) has suggested for the commodities he examined, this ratio might be as little as 0.6 unit of a futures commitment per unit of cash, or as much as 1.0 per unit of cash, depending on how the market tends to value differences in quality, location, and time factors that are associated with the cash as opposed to the futures commodity.

## Special Hedging Exemptions

Exemptions from position limits are now granted to certain types of processors who buy futures in order to fix the price of commodities they use as inputs. This activity, called "anticipatory hedging," was first permitted in 1956. Granting that processors have legitimate need to fix the price of inputs, one still might not discern any differences in market effects of positions taken for this reason as opposed to other reasons. Also, contracts entered into by businessmen are not necessarily more secure than those of speculators.

Moreover, a proposal introduced in 1936 (21, pp. 231-234) suggests that the original intent was different. The intent was to extend the hedging exemptions only to firms that had a *demonstrable equivalent of a fixed price commitment to sell their output*—e.g., firms that have branded and heavily advertised products, or firms whose selling prices tend to remain fixed and sales volume steady. But this intention was not translated into the language of the 1956 amendment. The amendment allows the processor to use the futures market to fix the price of commodity inputs up to the limits of his annual plant capacity (net of inventories and cash purchase commitments), *whether or not* he has a demonstrable equivalent of a fixed price for his output. More recently, this privilege was extended to livestock and poultry producers to cover their annual feed requirements.

Several questions arise. Why not restrict this privilege—by restoring it to the original intent of those who first sought it—or else extend it to others such as merchandisers and retailers? Have the privileges been extensively used by processors?

Partial light can be thrown on this matter with data on anticipatory hedges placed in wheat, corn, and soybeans futures in each of 7 quarterly periods ending June 30, 1974, as furnished by the Commodity Exchange Authority. Table 1 shows the largest quarterly uses and the number of processors and bushels involved. Thus, for wheat processors, only 2 or 3 percent of requirements was placed in futures, aggregating only 6 million bushels for up to 4 firms. For corn processors, only 5 to 6 percent of requirements was placed, aggregating only 12 to 17 million bushels for 5 or 6 firms; for soybean processors, only 4 to 10 percent of requirements was placed in futures, aggregating 19 to 62 million bushels by up to 4 firms.

Thus, except for soybeans, the bushels involved per firm, in the 7 quarters, were not much greater than allowed under current position limits, a situation that has been recognized by the control agency. Conceivably then, all or nearly all needs for anticipatory hedging exemptions might be met by liberalized position limits, as suggested in chapter 7.

Table 1—Statistics on use of anticipatory hedging privileges, in quarterly periods,  
September 30, 1972-June 30, 1974

| Item  | Wheat            |                      | Corn             |                      | Soybeans         |                      |
|---|------------------|----------------------|------------------|----------------------|------------------|----------------------|
|   | Highest quarter* | Next highest quarter | Highest quarter* | Next highest quarter | Highest quarter* | Next highest quarter |
| Calendar quarter .....                          | IV, 1972         | IV, 1973             | II, 1973         | IV, 1973             | IV, 1972         | III, 1972            |
| Number of processors <sup>1</sup> .....         | 4                | ( <sup>2</sup> )     | 6                | 5                    | 4                | ( <sup>2</sup> )     |
| Total bushels (millions) <sup>3</sup> .....     | 6.3              | 6.2                  | 17.4             | 11.9                 | 62.0             | 18.6                 |
| Share of requirements (percent) <sup>4</sup> .. | 2.3              | 2.9                  | 6.5              | 5.2                  | 10.4             | 4.5                  |

<sup>1</sup> Includes firms given anticipatory hedging exemption by the CEA when their long hedges in futures (reported on 03 forms) exceeded their cash sales commitments (reported on 04 forms).

<sup>2</sup> Less than four firms. <sup>3</sup> Long futures hedges less cash sales commitments. In the case of soybeans, products are included in sales commitments. <sup>4</sup> Requirements are those secured from the CEA based on annual processing capacity. The share of requirements was derived by taking bushels, shown in the table,

as a percentage of requirements less cash purchase commitments and stocks.

\* Calendar quarter with the largest number of bushels purchased as anticipatory hedges.

Source: Commodity Economics Authority.

Hedging exemptions which are the mirror-image of anticipatory hedging have been granted farmers. They may exceed position limits in order to fix the price of their planned output. The privilege is accorded to any grower who in good faith intends to produce the output on land he owns or leases in the United States in the following 12 months. The farmer is not required to show that he has fixed price commitments for farm inputs. Why not restrict this privilege or extend it to other businesses?

### Uneven Constraints on Spreading

Spreading operations are significant activities in futures markets. Informed and skillful traders engage in the simultaneous purchase and sale of different futures contracts for a commodity when the price differential is favorable—fundamentally, when the differential is judged to be above or below that justified by economic considerations such as the marginal cost of storage, processing, or transport. Spreads between domestic and foreign futures contracts for a commodity (sometimes called *international arbitrage*) may also involve the valuation of different currencies. Spreading tends to bring prices into line with costs and adds liquidity to the market. Both are useful economic functions.

In practice, most spreading between futures has been treated as speculation, although the Commodity Futures Trading Commission Act is permissive on how spreading might be regulated (see ch. 1). Each leg of the spread is now regarded as if it were a speculative position in its own right and to be limited in absolute quantity. In addition, the net position in all futures combined must be within a prescribed limit. For example, the limit placed on a speculative position in any 1 month allows a spread of no more than 3 million bushels of corn to

be held—i.e., long 3 million in 1 month and short 3 million in another. But a spreader may have larger positions if he also uses other futures months: having spread 3 million bushels of corn between 2 contract months, he could spread another 3 million bushels between 2 other contract months—and also have a single 3-million-bushel position in the fifth contract—a total of 6 million bushels on one side and 9 million bushels on the other side, with a 3-million-bushel net position. However, he still must observe the daily trading limit of 3 million bushels.

Spreading was liberalized in 1956 to permit the use of futures to “put on the crush” by the soybean processing industry. This means buying a quantity of soybean futures and simultaneously selling the bushel equivalent of oil and meal futures. This could not be done in any great volume before 1956. In 1956, the anticipatory hedging exemption became the enabling device: soybean futures could be purchased using this exemption, and corresponding quantities of products futures could be sold, because no Federal speculative limits were imposed on meal, and those that had been on oil had been removed earlier. On the other hand, “reversing the crush” by selling soybean futures against purchases of oil and meal futures had not been exempted from position limits. The Chicago Board of Trade rules explicitly exempt such activities from its own speculative limits.

Spreading is a desirable activity, as suggested before. But only soybean crushers can put on a “paper crush” in futures greatly in excess of 3 million bushels. In fact, they are limited only by their annual physical crush capacity minus inventories and purchases commitments. The reasons why “outsiders” are proscribed from engaging in such spreading between soybeans and its products on a similar scale are not clear.

A more general inequity exists. For most commodities traded in futures, spreading opportunities

would arise simply from having a hedge in futures. A futures hedge can be "managed" by shifting it to whatever happens to be the most advantageous contract, as indicated by price differentials among contracts. The shifting of a hedge involves simultaneous purchase and sale of futures, an operation which yields the same result as spreading.<sup>10</sup> A speculative position in futures also can be managed in the same way but only within the scale permitted by position limits.

Beyond this advantage, business firms frequently hedge on a gross rather than on a net basis, which could afford large-scale spreading opportunities. The following type of operation sometimes is called "double-hedging." A firm with 20 million bushels of cash corn inventories and 12 million bushels of fixed-price cash sales commitments of corn has an 8-million-bushel net cash position in corn. Under current rules, the firm can, if it chooses, be short 20 million bushels in one futures, against its cash inventory, and be long 12 million bushels in another futures against its cash sales commitments. Thus, in effect, the gross hedge would be composed of two futures ventures, namely, a 12-million-bushel spread between two futures months and an 8-million-bushel hedge. The firm might manage both ventures to its advantage. Furthermore, there are no daily volume constraints to observe.

Why not remove this special spreading privilege? Double-hedging is a practical way to overcome barriers to the use of futures markets that arise from a faulty definition of hedging. For example, old crop corn and new crop corn often behave like different commodities. Yet they are regarded as the same cash commodity under current regulatory practice. As long as this condition persists, the firm might benefit by hedging old crop inventories in old-crop futures and new crop sales in new crop futures rather than to hedge its net cash position in either futures. The same conclusion does not apply to differences in place or form of the commodity, unless the two futures contracts used in the double-hedge also differ in this respect. Hence if these conditions are not met, the double-hedge is likely to yield no better outcome than a hedge of the net position.

Another possible argument for double-hedging applies to firms operating on a decentralized basis. Futures orders entered by different division managers could result in the overall position of the firm being double-hedged in a commodity. But in this case, the actions of the separate division managers could be regarded as actions of separate firms, and

the issue of double-hedging need not arise. Whatever the rationale, double-hedging should be allowed unless it were a cause of market upsets.

A major issue is whether to extend the large spreading privileges, implied in double-hedging, to other traders. There is evidence that restrictions on who could assume the large spread positions has hurt competition in merchandising. For example, some merchants would like to assume spread positions in futures in anticipation of entering into cash deals to export or otherwise merchandise the commodity. Such cash deals, however, may require the removal of one leg of a futures spread in order to get a tolerable hedge. In some situations (e.g., where futures markets are thin, or prices are inverted) it is the only way some merchants can compete against strong rivals.

Abuses could arise from hedging gross cash positions rather than net cash positions. If two cash positions in a commodity—one long and one short—actually represent different commodities in an economic sense, the firm may be justified in hedging only its long or short position in some futures contract that gives it a reasonably good hedge for that position. But if the cash commodities are essentially the same, then hedging only the long or the short position in futures would result in using the futures market to establish a long or short position that is largely speculative. If such positions are denied to speculators, they should be denied hedgers.

#### Some Safeguards

The use of economic criteria for determining bona fide hedging requires information on the specific nature of cash commitments entered by the firm. This information should be subject to spot audit. Where good cash prices, with which to judge the correspondence of cash and futures price movements, are not readily available, the burden of providing such prices should fall on the firm seeking the hedging exemption. Presumably, if position limits were liberalized, as suggested in this report, relatively few firms would seek such exemptions. This would avoid a heavy burden on the Commission.

Secondly, there is a need to safeguard markets from precipitous actions by bona fide hedgers. The Commodity Exchange Act (17, p. 4) has required that hedging be performed in an orderly manner. If the Commission were to define hedging along lines suggested above, similar safeguards should be built into its language. For example, if sorghum were allowed to be hedged in corn, and corn were allowed to be hedged in sorghum, and there were no such safeguard, someone with a large cash corn position could elect to offset that position in a more

<sup>10</sup>Indeed, the hedge of a cash position in futures can be regarded as a particular kind of spreading operation, although it is seldom spoken of in this way.



limited grain sorghum futures market and, thereby, become a larger force determining prices in that market than he would have been in the corn market. This possibility would need to be evaluated.

Third, there is a need to monitor the timing of hedges. In hedging practice, not all cash and futures positions are established simultaneously. Ideally, they should be so established if hedging were to have a minimum impact on price levels. But a business firm may need some leeway in placing its hedges in futures, or in acquiring the cash commodity against a futures position that it had just assumed. But this leeway should be no greater than necessary either to overcome the discontinuity of trading in each 24 hour period or to preserve an orderly market.

Such a timing requirement would guard against certain abuses from gross hedging. It would forestall a firm that ordinarily has both long and short cash positions in a commodity from subsequently using either or both positions as a rationale for

establishing large futures positions. But it would not prohibit a firm that had acquired a cash inventory and hedged it in futures, from later establishing a long futures position in another futures delivery month, upon entering a cash sales agreement, rather than liquidate its short futures position. Thus, double hedging would be permitted if it were done in a bona fide manner.

In the case of spreads between futures contracts, there is no apparent justification for much leeway in timing. Indeed, execution of both sides should be done without much delay within the trading session. As matters now stand, traders' positions are known only at the end of the day. Hence, there is an argument for not liberalizing spreading privileges until better monitoring techniques are developed. Yet, because large-scale spreading that is contained in double-hedging probably would not be held to account within the day, it might be best to liberalize spreading by everyone. The entire matter needs careful empirical study.

## 10. CONCLUSIONS AND RECOMMENDATIONS

The concept and role of hedging were examined in the context of a basic dictum. It is that the goal of regulation should be to make futures trading more widely useful and accessible, while at the same time curtailing artificial influences that such a highly organized institution may inject into commodity pricing. In this context, the inquiry was conducted on broad lines. The principal conclusions of the study, and the recommendations in respect to the treatment of hedging, are as follows:

### Conclusions

1. The most constructive way to improve the futures trading machinery is to better adapt contract terms to changing market conditions. At issue are the selection of deliverable grades and locations, techniques for financial settlements when non-par deliveries are made, and related terms.

A key difficulty is the lack of good cash price information. In some cases, cash trading is too scant to permit meaningful price reporting. In others, cash trading is substantial but too dispersed to report by usual methods. Were cash prices regularly and accurately reported, they might be used to advantage in the design of futures contract settlements, thereby increasing the precision of competitive pricing and broadening the general usefulness of futures trading.

By clarifying the potential contribution that better cash price reporting could make, purpose

and direction would be given to efforts to improve the cash price reporting system for commodities.

2. All commodity futures contracts have a squeeze potential because there are positive costs of making and taking delivery. These costs may or may not present serious problems, depending on the nature of the commodity stored and on the availability of stocks, storage, and transport services in relation to the number of contracts outstanding. Large delivery costs tend to create a large squeeze potential. Such costs should be examined closely to see how they might be reduced.

3. The better the design of futures contract terms, the larger the positions that can be sustained without distorting prices. Thus, the need for limits on futures trades and positions is directly related to the susceptibility of prices to distortion. But, the potentials for improving contracts may be limited by the underlying structural features of commodity markets. Markets differ widely in what improvements might be achieved. Thus, economic analysis of structural features is an essential part of the information required for deciding what conceivably could be done in each commodity situation.

4. Where general constraints on futures positions are needed to lessen the squeezability of futures markets, they should be applied without respect to whether the positions are classified as hedging or speculation. Ideally, there should be a general constraint on the total open positions of all traders in a contract during the delivery month,

geared to the economically deliverable supply of commodity. Reasonably accurate estimates of the matter might allow position limits to be adjusted by the exchanges or the Commission in time to avoid "trading for liquidation only."

Basic research should be done on the issue. To overcome practical difficulties, there needs to be a more rigorous conceptual basis for deriving estimates of economically deliverable supplies, and appraisal of alternative model specifications and data requirements.

5. The relation of present position limits to the orderly liquidation of futures contracts needs careful study. Flat position limits are inefficient and unnecessarily restrictive. Limits should be more liberal early in the life of a contract and more restrictive as the delivery period progresses. Probably the Commission in cooperation with the exchanges should experiment with tapering position limits in order to learn of their potentials, and problems of their management and monitoring.

6. The successful application of tapering limits would allow the Commission to sidestep the need for granting a great many hedging exemptions. Conceivably, the caseload to come before the Commission could be reduced to a relatively small number of users.

7. The present definition of bona fide hedging is too restrictive in some cases and too liberal in others. The criterion of physical resemblance of commodities that has dominated the law should be replaced by an economic criterion. Conceptually, hedge positions should be identified by the expected degree of correspondence of profit and loss sustained on cash and futures positions for a given commodity. In practice, this criterion may be approximated by the degree of expected correspondence in their price movements, as revealed by statistical analysis.

8. Such definition of hedging also would be a useful guide to futures brokers in assessing, for the purpose of determining margin requirements, the collateral value of their customers' cash commodity positions. If position limits were greatly liberalized, as suggested in this study, accurate assessment would be all the more necessary.

9. The practical problem of defining bona fide hedging in economic terms can be manageable or unmanageable, depending on how it is handled. Guides to hedging probably can be developed, based on past experience. In most cases, what is called hedging today would be hedging under the new criterion. The Commission probably could make these determinations and publicize them. But most of the Commission's work likely would arise from new hedging proposals that could not be accommodated under existing position limits—e.g., hedging a given grade and location of sorghum,

barley, or some other feed, in corn futures. The burden of supplying the Commission with the necessary price data should be put on the firm seeking the exemption. The Commission would make the determination using appropriate statistical tests.

10. In cases where more liberal use of futures were granted, the firm would be under an obligation to provide evidence, upon request or audit, that it has in fact the cash positions it claims to have. In practice, this probably means filing the required information daily. The information supplied by the relatively few firms that would want more liberal use of futures than allowed under expanded position limits could be monitored closely by the Commission.

### Recommended Changes in Treatment of Hedging

Present exemptions from position limits can be made more equitable and consistent.

*Commodity Matching.* The need here is to convert, insofar as feasible, the physical definition of "the same cash commodity" into an economic definition. The appropriate test is whether there is close correspondence between price movements for cash and futures commitments, given the form, place, and time specifications of each. In this light, the following general recommendations seem warranted.

(a) *Form:* Include in hedgeable cash commitments the same physical form as called for in futures, except for classes, grades, or qualities whose cash price changes (at the given place and time of delivery) are not closely correlated with corresponding cash price changes for types deliverable at par on futures. Conversely, where it can be shown statistically that another commodity is a close economic substitute for the commodity traded on futures, such a commodity should be counted in the hedgeable cash commitments. (This was the case for various fats and oils that businessmen sought to hedge in soybean oil futures. However, the accommodation to their needs resulted in removal of position limits instead of broadening the hedging exemption.)

(b) *Place:* Include in hedgeable cash commitments all locations of a commodity (as defined above) whose price movements are closely related; exclude the rest. As a practical matter, this guideline may be used in a rough and ready way: commodity inventories located outside the United States should be excluded from hedgeable cash

commitments except where it can be shown that price movements for the commodity in foreign locations are closely related to price movements in U.S. futures delivery locations. There are periods when national policies of a country insulate the price of its commodity from foreign competition. Thus, a showing of a close economic connection of prices here and abroad is necessary.

Within the United States, exclude locations of a commodity from hedgeable cash commitments only if prices at such locations move independently. With improvements in communication and the great decline in real costs of transport, this is less and less the case. It probably would be best to include locations throughout the United States until the harm of this rule can be demonstrated.

(c) *Time:* For seasonally produced commodities, restrict the hedging of old crops to old crop futures and new crops to new crop futures, except where it can be shown that a trader can use new crop futures as a reasonable hedge against old crop inventories. For continuously produced commodities that are storable (e.g., oil and meal, metals), no such restrictions should apply.

For perishable commodities, such as live cattle, live hogs, fresh shell eggs, and broilers, hedging should be allowed only in the delivery months most closely associated with the termination of the production period as indicated by the nature of the cash commitments claimed as the basis for the hedge. A rough and ready rule is to limit hedging to the two contract months most closely matching the time of output. The practicality of enforcing this rule would vary from commodity to commodity.

(d) *Quantities:* Where two or more important inputs are needed to produce a commodity (such as feeder animals and feed for producing fed animals), allow hedging of the output in futures to be done only to the extent that cash commitments are made for both inputs, and are made in the right proportions.

Conversely, where one commodity is made into two or more important products (such as soybeans made into oil and meal), allow

the cash commodity commitment to be hedged in the product futures only to the extent that roughly the right proportions of both product futures are held.

Where there is no futures trading in one of the two products, and the product has not been sold forward under a fixed-price commitment, then no hedging in products is permissible, unless it can be shown that price changes for the two items—the input and one output—are closely correlated.

Where a cash commitment is deemed hedgeable in futures by all criteria given up to this point, permit one unit of futures for one unit of the cash commitment, if this would reduce profit variance, but permit less than this if profit variance is substantially increased thereby (see Heifner (4)).

*Special Hedging Exemptions.* From several viewpoints, it would be desirable to do away with anticipatory hedging exemptions. Incomplete use seems to be made of this privilege by those who have been granted it. Raising position limits to accommodate the amount of anticipatory hedging that has been done seems the best course. If the anticipatory hedging exemption for processors is retained, the privilege should be extended to other businesses. The 1974 legislation allows movement in this direction.

Hedging exemptions for advance selling of crops are mostly unused. Modern commercial farms are still relatively small in relation to position limits. Also, farmers who have output risks may find that hedging more than a portion of the crop before harvest is unwise. Hence, whether such exemptions are retained or removed probably does not make a great deal of difference at present. More study is needed before a firm recommendation can be made.

*Spreading.* The treatment of spreading—whether the spreading is direct or indirect—should be more consistent. All spreading probably should be subject to daily trading limits and to some general restrictions on size of spread positions (both in the delivery month and before). Different kinds of spreading might have different limits. Because liberal spreading privileges can be abused within the trading session, the liberalization suggested here should be made conditional on having a good monitoring system.

The following should be included in recognized spreads: (a) spreads between two futures delivery months in the same commodity; (b) spreads between two futures contracts on two different commodity exchanges for the same commodity;

and (c) spreads between futures in a commodity and in its products. Whether spreads between intercrop contracts should be allowed would depend on how interdependent the price changes for old and new crop contracts are judged to be.

**Gross Versus Net Hedging.** As explained in the previous chapter, gross hedges that result in double hedging may be regarded as including two futures ventures—namely, a simple hedge in futures and a spread between futures months. The choice is to prohibit such hedging on a gross basis, or to open the implied privilege of spreading to others. If general constraints could be worked out as suggested in

chapter 7 to properly limit the daily volume of trading and the positions carried into the delivery month, including a reduction of such positions as the month progresses (by all traders), there should be no objection to the more permissive rule. It probably would improve market performance.

The safeguards against abuse of the gross hedging privilege are the provision of necessary information with which to judge whether futures were being used to increase or reduce the speculative position of the firm. Hence, study should be given to practical ways of reporting the necessary information to the Commission.

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