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THE GRAIN EXCHANGES AND THEIR INFLUENCE ON LATIN AMERICAN AND CARIBBEAN EXPORTS

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I. GRAIN EXCHANGES: HISTORICAL REVIEW OF THEIR ROLES, FUNCTIONS AND INSTITUTIONAL ORGANIZATION

1. The creation of the Chicago exchange

The history of grain exchanges is relatively recent and is closely linked to the development of means of transport and communications during the past century. Prior to that time, the lack of rapid transport infrastructure limited the possibilities of moving foodstuffs at a reasonable cost between distant regions, and the food needed by each town or city therefore had to be supplied by neighbouring areas; consequently, the first such markets were usually local in nature. Only a few categories of goods with high unit prices (jewels, precious metals, silks, spices), could bear the transport costs involved in moving merchandise over long distances. It was not until the Greek and Roman Empires flourished that a certain level of interregional trade was conducted in foodstuffs and raw materials. As interregional trade developed in the medieval era, markets or "regional fairs" began to be organized at previously specified times and places by the first associations of merchants.[1] Some of these scheduled fairs gradually took on a more permanent nature, and eventually all types of merchandise were traded in them.

The development of modern cities led to the substitution of specialized trade centres for the regional fairs. These markets, which came to be known as "exchanges", were initially located in open-air squares but were later moved to enclosed locations. Subsequently they spread throughout Europe, Japan and the United States. At the beginning of the nineteenth century, the development of the railroad and of river and maritime transport in the United States made trade flows possible between zones with a greater production potential and the centres of demand. This in turn contributed to commercial integration at the national level and the displacement of the earlier models based on self-sufficient communities. The invention of the telegraph played a significant role in encouraging trade between America and Europe by making it possible for European buyers to obtain information about prices and supplies in export markets before the grain was shipped.

The city of Chicago in the State of Illinois, which was founded in 1833 and is strategically located at one extreme of the Great Lakes and at the start of the fertile farmlands of the United States corn belt, gradually developed into the centre for the

country's grain trade. The opening of the Michigan-Illinois Canal contributed to the steady growth of the Chicago grain market and to the establishment of processing industries there. Corn and wheat producers sold their produce to merchants along the river, who then transported it to Chicago, where it was either shipped to the eastern part of the United States and to other countries, processed by local industries, or else used as cattle feed by the livestock industry located in the area.

The existence of a central reception point for information on grain production and trade led merchants to start systematizing shipments and drawing up more reliable contracts for their future grain sales on a "forward" basis, i.e., cash transactions for delivery at a specified time in the future under agreed conditions (prices were set as of the date of the contract).

In spite of this, during the first years of the Chicago market's operation, trading activity became utterly chaotic at each harvest as a result of the temporary imbalance between the supply and demand for grain on the spot market. Frequently producers and merchants who arrived at the market with grain found that the short-term requirements of industrialists or exporters were not sufficient to absorb all of the supply, and this problem was compounded by the shortage of facilities for storage and shipment from Chicago. Price fluctuations were violent, either because the quantity of grain received was in excess of the capacity for processing, shipment and storage —causing prices to fall— or because the supply was insufficient, which caused unexpected price increases. The lack of quality and weight standards also led to unfair trading practices and to bitter disputes between sellers and buyers.

These difficulties made it necessary to develop a central market for standardized grain sales, not only for spot transactions but also for forward deliveries. Thus, in 1848 a group of 82 businessmen founded the Chicago Board of Trade (CBT), for the purpose of bringing buyers and sellers together in the same location, promoting uniformity in trading practices and customs, inculcating trade principles of fairness and equity, receiving and disseminating commercial and economic information, and providing its members with the benefits of cooperation in the pursuit of their legitimate interests (CBT, 1985).

2. Historical review of the exchange's roles and functions in domestic and international trade

The modern marketing of grain basically involves three types of sales, which are used to complement one another: a) spot transactions; b) forward sales; and c) futures contracts.

Spot grain contracts involve cash sales for immediate delivery in which the price is set at the same time that the ownership of the grain is transferred. The initial sale of grain by a producer to a local grain-elevator firm, in which the merchandise is delivered to the storage facility and paid for in cash, is the most typical example of this type of transaction. Prices are set on the basis of the location and quality of each grain lot.

Forward sales add a time dimension to spot sales, since, in addition to establishing the price, the quantity, the quality, and the delivery point, forward contracts also specify the date on which ownership is to be transferred. This type of transaction is sometimes used for the initial sale, but it is more frequent in export operations; most foreign sales are conducted on a forward basis, with payment being made against delivery. These contracts usually do not call for a security deposit, which means that the risk of non-compliance is greater and are not very liquid owing to the fact that the quantity, quality, and delivery point are fixed.

Futures sales are carried out in the exchanges, or central markets, and are based on standardized futures contracts in which the quantity, quality, place and time of delivery (certain months of the year are designated for each type of grain) are specified. In contrast to contracts of the other two types, futures contracts are seldom used for physical operations (in general, delivery is made on only 0.5%-2.5% of futures contracts) (see tables 1 and 2). The standardization of these contracts gives them greater liquidity and facilitates price formation, but their specified terms and conditions do not usually coincide with the precise needs of each trader with respect to the place and time of delivery, quality and quantity. Therefore, spot and futures markets tend to operate in a complementary manner, thereby helping to improve the trading system's performance.

a) <u>The historical development of contractual forms and procedures</u>

The historical development of these different types of contracts was a gradual process. After the creation of the Chicago exchange, the cash market for grain continued to operate but forward contracts, which had begun to be used immediately after the funding of the city of Chicago in 1833, gradually took on greater importance. These contracts specified delivery dates in the near future, based on the amount of time involved in transporting the grain. Their use grew rapidly, since they provided more flexibility for resale than cash sales did, despite the fact that the quantities and qualities covered by the contracts varied; in view of this limitation, for a number of years efforts were made to standardize forward contracts and thus facilitate resales. Nonetheless, due to the short maturities of these contracts, they still did not resolve some of the other financial problems and risks facing merchants, particularly since the growing volume of

Table 1

TOTAL NUMBER OF GRAIN AND OILSEED CONTRACTS TRADED, ACTUAL DELIVERIES AND OPEN INTEREST IN THE UNITED STATES FUTURES MARKETS (ALL MARKETS)

Year	Grain				Oilseeds			
	Total traded (thousands of contracts)	Actual deliveries (thousands of contracts)	%	Open interest* (thousands of contracts)	Total traded (thousands of contracts)	Deliveries (thousands of contracts)	%	Open interest* (thousands of contracts)
1981	19 808	86	0.43	303	20 315	240	1.18	264
1982	14 885	118	0.79	230	15 763	173	1.10	187
1983	17 794	73	0.41	265	19 823	188	0.95	215
1984	15 889	110	0.69	291	23 489	438	1.86	223
1985	10 726	134	1.25	212	14 883	193	1.30	173
1986	10 315	68	0.66	200	13 799	174	1.26	183
1987	10 945	298	2.73	198	14 152	193	1.36	216

Source: Commodity Futures Trading Commission, Annual Report 1987, 1987.
Note: * Open interest shown in monthly averages.

Table 2

RATIO BETWEEN CONTRACT DELIVERIES AND VOLUME TRADED AND BETWEEN OPEN INTEREST AND TOTAL VOLUME TRADED (1986/1987)

Products	Contract deliveries / Total contracts				OPEN INTEREST (monthly) / Total contracts			
	CBT	MACE	KCBT	MGE	CBT	MACE	KCBT	MGE
Wheat	1.70	1.37	2.70	6.79	1.77	3.01	2.10	1.67
Corn	2.95	1.03	-	-	1.83	2.64	-	-
Oats	2.09	3.51	-	-	2.27	3.20	-	-
Soybeans	1.37	2.08	-	-	1.24	2.08	-	-
Soybean oil	2.43	-	-	-	2.01	-	-	-
Soybean meal	0.07	7.84	-	-	1.75	8.76	-	-

Source: Commodity Futures Trading Commission (CFTC), Annual Report, 1987.

Note: * CBT: Chicago Board of Trade
MACE: Mid-America Commodity Exchange
KCBT: Kansas City Board of Trade
MGE: Minneapolis Grain Exchange

** Contracts are for 5 000 bushels of grain in the CBT, KCBT and MGE, and for 1 000 bushels in the MACE.
Contracts for 60 000 pounds of edible oil in the CBT and for 100 tons of soybean meal in the CBT and for 20 tons in the MACE.

*** Agricultural year ending 30 September.

trade between producers and the local grain merchants who had set up businesses along the river banks was concentrated in the period immediately following the harvest, when the producers carted their grain to the brokers' storage facilities. However, the latter —especially in the case of corn— had to store the grain during the winter and part of the spring, while waiting for the moisture content of the grain to decrease and for the navigable rivers to thaw so that the grain could be transported to Chicago. This mode of trade made it necessary for local merchants to hold stocks, and they therefore needed larger cash reserves in order to pay grain producers at the time of delivery and to invest in storage facilities. It also entailed a high level of risk owing to the possibility of price changes between autumn (the season when they purchased the grain) and spring (when they sold it in Chicago).

In order to overcome these difficulties, the local merchants operating along the riverbank developed a new sales method whereby they sold the grain in advance to traders in Chicago on the basis of "future-delivery contracts", at posted or firm prices set at the time the contract was signed, for delivery in the spring. The length of time covered by these contracts distinguished them from forward sales, in which deliveries were almost immediate. The first such contract was dated March 1851 (Hieronymus, 1978). The local merchants, or traders, found the new contracts extremely useful, since they reduced the risk associated with price variations and facilitated access to credit (granted by the Chicago traders or the banks), permitting them to make more rational and more competitive offers to the producers. In these cases, the Chicago traders acted as buyers; however, they in turn often sold future-delivery contracts to exporters and mills located further east.

The variation of prices over time made it possible to realize profits through the purchase and sale of these contracts, and this induced another type of trader to enter the market: the speculator. These traders bought and sold future-delivery contracts —and thus assumed risk— as a means of realizing gains on price differentials, but had no intention of trading in the physical merchandise. The incorporation of this type of participant was of great importance, particularly after the Crimean War, and the subsequent civil war in the United States, when prices fluctuated considerably and Chicago grain merchants tended to reduce the prices of their advance purchases in response to the risk of price declines. The entry of speculators into the market helped to ensure that these contracts would play an important role in supporting prices, that they would change hands several times, and that only a small proportion of the operators who traded in them would be interested in actually receiving the merchandise. Thus, the foundations were laid for the development of true futures contracts, in which delivery of the merchandise has little significance, since their main functions are hedging and speculation.

Various difficulties existed in the mid-nineteenth century which had to be overcome in order to make the use of futures contracts possible in the grain market. These included (FIA, 1977):

i) The lack of adequate storage capacity. Any organized system for the marketing of grain requires assembling points and storage infrastructure to ensure that the grain will be in good condition at the time of delivery. In the first half of the nineteenth century, the rapid increase in production and the growth of the country's cities was not accompanied by a corresponding expansion of storage facilities, which gave rise to problems in the handling of grain. Consequently, laws and regulations were promulgated in order to ensure the proper handling and storage of these commodities in grain elevators; this legislation, which established the requirement that grain elevators be licensed by the exchange and which created a system for the inspection of the grain stored in these facilities prior to its delivery, is still in effect today.

ii) The need to standardize quality and weight. Due to differences in the quality of the grain being traded, the specifications of forward contracts were often not met, and this led to litigation and delays in payment, thus discouraging the sale of grain that was not on display. In order to solve these problems, in 1854 the Chicago Board of Trade introduced the practice of selling by weight and in 1857 a system for the inspection and weighing of the grain was created. All of these steps led to the standardization of the quantities covered by each contract, which is a basic feature of the futures contracts in use today.

iii) The need to standardize terms of payment. The terms of payment provided for in forward contracts often varied, and it became necessary for the exchanges to standardize them in order to facilitate the use of futures contracts.

iv) The need for price discovery. Since forward contracts were private transactions whose terms and conditions were known only by the two parties to each contract, there was no certainty as to whether or not the prices for a particular transaction were the best that could be obtained. The need for prompt and reliable price information led to the practice of conducting business on the floor of the exchanges in the "pits", where buyers and sellers use what is known as the "open outcry" method, and to the immediate announcement of their transactions.

v) The need to make possible the resale of contracts. Particularly in the case of speculators, but also in that of other traders, the buyers and sellers of futures are not interested in making or taking delivery but rather in re-buying or re-selling the contracts later on. In order to achieve this flexibility, it was necessary to facilitate the settlement of contracts, and the

exchanges therefore created what are now known as "clearing houses", which are responsible for adjusting trading accounts.

vi) The need to ensure the fulfilment of the contracts. Reliability is a fundamental need in the case of futures markets, since buyers and sellers do not know each other and change frequently over the term of a contract. The clearing houses helped to ensure that contracts would be honoured by becoming a buyer to every seller and a seller to every buyer.[2] In order to further improve contract performance, in 1865 it was ruled that buyers and sellers should deposit an initial margin (a percentage of the contract's value), as well as additional margins on a day-to-day basis to cover any difference between the closing price of the day in question and that of the preceding day; these margins are credited to the other party.

In order to meet these needs, in 1865 the Chicago Board of Trade established a body of general market rules, which provided for the standardization of contracts and delivery conditions, indicated the terms of payment and specified the procedures to be followed in cases of failure to deliver and for the deposit of margins, etc.; in other words, they laid the foundations for the modern system for trading in grain futures which is used today. These rules were supplemented by others as disputes arose that the CBT had to resolve. By 1875 a quite complete set of rules had been developed, and this contributed to a sharp increase in trading volumes in terms of both contracts and physical deliveries. In just 36 years, between 1848 and 1884, corn shipments from Chicago rose from 0.55 to 59.6 million bushels and wheat shipments climbed from 21.6 to 26.4 million bushels. At present, despite the fact that direct purchases have limited the physical concentration of grain in these markets, between 150 and 200 million bushels (about 7 million tons) of grains are delivered annually in Chicago and futures representing much greater amounts of the principal grains and related products are traded.

b) Commercial uses: hedges

Various authors agree that the Chicago exchange was organized by grain merchants primarily for the purpose of serving as a market for physical deliveries (Gray and Rutledge, 1971) and that the important role it might play in other respects was not foreseen. However, its rapid growth was largely associated with the other functions of futures contracts: hedging and speculation.

For firms operating in the physical market for grain or related products (producers, warehousers, processors, exporters, etc.), futures contracts' chief function was to serve as an efficient and effective mechanism for protecting these firms against price risk through hedging (Irwin, 1954; Working, 1953-1954). Hedging is very useful for all participants in grain markets

(which are seasonal markets), from producers to processors and manufacturers, but it is particularly important for middlemen (grain elevator firms, exporters), whose returns are essentially determined by purchase and sale prices and, consequently, are directly influenced by seasonal price variations. During the second half of the nineteenth century and most of the twentieth century, futures were used by grain elevator firms to hedge the risk associated with storing grain during the business cycle. The comparison of futures prices with cash prices and carrying charges permitted them to decide whether or not it was advisable to purchase and store grain, but by selling futures at the same time (arbitrage), they covered themselves against any subsequent price variations during the storage period. The usefulness of futures for hedging led to their being employed as temporary substitutes for cash sales of merchandise and this prompted analysts to regard futures exchanges as essentially speculative markets, without recognizing their importance in guiding decision-making with regard to the holding of grain reserves. This view engendered various criticisms and political attacks on the exchanges and subsequent official investigations, which ultimately contributed to a better understanding of the usefulness of futures for managing stocks and determining their levels (inventory hedging).[3]

Other non-speculative ways of utilizing futures markets for sales and hedging have emerged in recent years. One of these, which is used by grain processors and exporters, is known as an operational hedge and consists of the purchase of futures as an immediate means of covering commitments for the sale of processed products (in the case of mills) or shipments (in the case of exporters).

For these activities, futures markets can be used as a reliable guide with respect to the prices at which it is possible to acquire and sell grain. Moreover, they are very liquid, which permits the immediate purchase of large quantities. The significant growth of world trade over the last three decades and the sharp price swings observed since the 1970s have contributed to the widespread utilization of futures markets by exporters, who have used them mainly in two ways: a) as a basis for sales and b) to hedge sales immediately after offers have been accepted, utilizing them as temporary substitutes for purchases of grain to be made later. As the exporter gradually acquires the merchandise at the required delivery points and times, he sells his futures contracts; this course of action permits him to significantly reduce his price risk. The marked volatility of grain prices and financial assets during the 1970s sparked an increase in the levels of speculation in futures markets in absolute terms, but the increase in the variety of speculative (or commercial) operations was even more significant, according to studies carried out by various researchers (Peck, 1981). Among these commercial uses of futures, the greatest growth was seen in the opening of long positions (short positions are used mainly for hedging inventories); this

development was associated with an expansion of exports during a time of increasing price variability, which obliged exporters to hedge their transactions in futures markets. This mode of operation has contributed to the growing internationalization of grain markets in the United States and especially of the CBT, since a large part of export sales by that country, as well as by its competitors, are conducted on the basis of premiums above (or discounts below) the market quotation for a specified delivery month.

Another commercial use of futures markets which has boomed since the 1970s is the anticipatory hedge, consisting of the sale (or purchase) of futures prior to a sale (or purchase) of physical grain or related products. Most of the hedges made by producers and some of those made by exporters, importers and mills are of this type. The purpose of this kind of hedge is to permit the dealer to select the date of sale (or purchase) considered to be most advantageous independently of logistic restrictions. This method entails a value judgement concerning the price levels in futures markets at different points in time, since the idea is to select the most desirable dates on the basis of an analysis of market trends or other criteria (a steady level of sales throughout the year, etc.). In this case, the avoidance of risk is a less important element than it is in inventory hedging or operational hedging, given that the anticipatory hedges is speculating on the total price rather than the basis. Nevertheless, some export firms and organizations (e.g., the Australian Wheat Board) also use anticipatory sales to improve the average export prices for their grain, since such sales permit them to "lock in" their prices during the period they select, regardless of when the importing countries need to buy the merchandise from them. In addition, anticipatory hedging is a very useful means of organizing and improving the purchasing strategies of institutions in charge of managing developing countries' imports (e.g., the National Basic Commodity Corporation (CONASUP) of Mexico); in these cases, anticipatory purchases are helpful not only in selecting the best times to set purchase prices, but also in arriving at accurate projections of budgetary and exchange requirements.

c) Speculative uses

Another very important function of the futures markets is that of incorporating speculators, i.e., traders who do not deal in physical merchandise but only futures positions, and whose losses or gains therefore depend essentially upon those positions. Their incorporation into these markets dates back to the founding of the exchanges in the mid-nineteenth century, when they were of great importance in smoothing out the price swings which occurred as a result of the United States Civil War. Because speculators sell when they expect prices to fall and buy when they foresee price increases, their presence tends to prevent extreme price

volatility; their interaction with hedgers increases the level of activity, competitiveness and liquidity of these markets. In general, speculators assume the price risk that hedgers are trying to avoid, but the literature on this subject distinguishes among three types of speculators: a) those who establish positions; b) those who speculate in the relative prices of different contracts; and c) those who speculate in price spreads arising in the course of a trading day.

The establishment of positions is the best-known form of speculation and its purpose is to realize gains from price changes over a period of time that may range from one or two days up to many months. In recent years this form of speculation has represented between 15% and 30% of the total volume of contracts for the principal grains remaining open at the end of each trading day (i.e., open interest) in the Chicago market (see table 3). Professional speculators as well as non-specialized traders engage in this type of operation.

A second alternative is the simultaneous purchase and sale of two different positions (for different delivery months of the same product, for different products, markets, etc.) in the hope of making a profit from changes in relative prices, independently of the trend of absolute price levels; the total number of open contracts for each type of grain at the end of each trading day which correspond to this form of speculation varies between 5% and 10% of total open interest (information on cross hedging is not available).

The third form of speculation consists of opening and closing market positions within the span of a single trading day. Since the object is to exploit price spreads on an immediate basis, there are usually no positions of this type remaining open at the end of the session. Clearly, this activity cannot be measured on the basis of the positions remaining open at the close of the trading day, and it must therefore be calculated on the basis of the total trading volume for each session. While there are no exact data with respect to the distribution of total volume among the various kinds of traders, it has been estimated that speculation accounts for between 90% and 95%, and that most of this percentage corresponds to this third type (Rutledge, 1978); and consequently, the activity of these types of speculators (commonly known as "scalpers" or day traders) is often referred to as "forming the market".

Table 3

SHARE OF OPEN INTEREST ACCOUNTED FOR BY DIFFERENT TYPES OF TRADERS IN UNITED STATES FUTURES MARKETS ON 30 SEPTEMBER 1988

(Percentages of total open interest)

	Wheat			Corn	Soybeans	Soybean oil	Soybean meal
	Chicago	Kansas	Minneapolis	CBT	CBT	CBT	CBT
I. POSITIONS NOT REPORTABLE							
- long	39.9	32.8	63.6	38.3	40.1	33.3	41.6
- short	31.1	19.6	29.5	39.5	38.9	30.8	30.2
II. REPORTABLE POSITIONS							
- long	60.1	67.2	36.4	61.7	59.9	66.7	58.4
- short	68.9	80.4	70.5	60.5	61.1	69.2	69.8
II.1 Hedging							
- long	34.5	61.6	35.1	46.2	32.5	52.9	39.8
- short	58.6	79.0	70.5	52.9	47.5	54.0	55.4
II.2 Speculation							
- long	25.5	5.4	1.3	15.6	27.4	13.9	18.6
- short	10.2	1.4	0.0	7.6	13.6	15.3	14.5
II.2.a) Positions							
- long	19.0	4.7	1.3	11.3	20.8	5.1	9.9
- short	3.7	0.5	0.0	3.3	7.0	6.5	5.8
II.2.b) Spreads							
- long	6.5	0.9	0.0	4.3	6.6	8.8	8.7
- short	6.5	0.9	0.0	4.3	6.6	8.8	8.7

Source: CFTC, "Commitments of Traders", Chicago, September 1988.

d) Other recent uses of futures markets

The marked volatility of grain prices observed in the early 1970s, high inflation rates and uncertainty concerning interest rates prompted a sharp increase in trading activity in grain futures markets for commercial as well as speculative purposes. This was particularly true of the Chicago market, whose liquidity (i.e., the ease with which one can enter and leave the market) attracted many speculators from other sectors. It should be noted, however, that in October 1975, the CBT introduced the first financial futures contracts backed by mortgage bonds and, in the following years, others were added, including United States Treasury bond futures,[4] which, in the 1980s, drew traders away from grain futures. Indeed, the growth of financial markets in the 1980s was very rapid and this has diminished the relative importance of commodities (see table 4).

Two outstanding events occurred in the CBT in the 1980s. In 1982, options on futures contracts were introduced. This innovation offers investors, and anybody else who wishes to manage risk, the flexibility and possibility of defining and limiting their risk to a specified level of variation. Options on United States Treasury bonds were first introduced on an experimental basis, and their success led to the extension of this mechanism to include grains (wheat, corn, soybeans). Less than one year after the introduction of corn and soybean options, more than one million contracts had been traded. Then, in April 1987, the CBT initiated an evening trading session for financial futures, which corresponds to the morning hours of the workday in the Asian markets, in order to attract business from those markets. Its success and acceptance led to the introduction of a Sunday night session which coincides with Monday morning in the Far East, the most active business day in that area. All these steps have been aimed at enabling the CBT to tap the recent growth of financial markets and capital flows at the world level.

The growing interdependence between financial and commodity markets throughout the world made the internationalization and diversification of the exchanges necessary. To this end, the CBT is establishing international branches; it has already opened a European office in London and an Asian office in Tokyo in order to coordinate operations with other exchanges in other countries. Possible relationships with futures markets of different countries are also being studied.

Table 4

GRAIN AND OILSEED FUTURES AS A PERCENTAGE OF TOTAL TRADING VOLUMES * IN THE 1980s (ALL UNITED STATES MARKETS)

Year	Total volume of trading		Open interest (monthly)	
	Grain	Oilseeds	Grain	Oilseeds
1981	19.6	20.1	17.7	15.2
1982	13.8	14.6	16.0	13.0
1983	13.1	14.6	16.5	13.5
1984	10.7	15.8	16.4	12.5
1985	7.0	9.8	12.1	9.8
1986	5.6	7.5	10.1	9.3
1987	5.1	6.6	8.3	9.1

Source: CFTC, Annual Report, 1987, 1987.
Note: * Includes other agricultural products, fuels, wood, metals, financial instruments and currencies.

3. Institutional organization. Articulation and regulations

The financing and organization of futures markets involves various types of participants and institutions. Among others, these include: a) the exchange itself; b) the body that registers and settles contracts (the clearing house); c) the commission house and the floor brokers; and d) agencies for regulating and controlling the market.

a) The Chicago Board of Trade

The CBT, like other grain exchanges in the United States, is a non-profit organization. Some of its members are associated with commission houses, others represent traders with interests in specific products and still others trade on their own account. The Board exists mainly for the purpose of providing the infrastructure and facilities required in order for traders or their agents to conduct transactions involving grain, related products and other futures within a public auction market. Its primary responsibility is that of ensuring competition in the market and limiting any type of manipulation. The CBT is the main grain futures market in the world for wheat, corn, oat, soybean, soybean oil and soybean meal futures and options. Tables 5 and 6 show volumes, products and other historical data for the CBT and other markets in the United States.

Functions: The exchange as such does not own commodities, operate for its own account or do anything to influence daily market prices; it merely provides the physical means for operating an open auction market and –in cooperation with several of its members– develops, publishes and establishes trading regulations designed to ensure equal and fair treatment for all participants in the market. It establishes and determines the particulars of all futures contracts traded on the floor of the exchange (including the delivery months for each type of contract), sets initial margins and margin calls for each product, supervises the daily activity of floor brokers, helps to prevent and control any attempt at manipulation, develops and establishes delivery procedures (including the designation of the storage facilities to which delivery may be made), carries out official inspections of all merchandise for delivery against short futures positions and, in general, provides services which tend to expand futures trading. Through special committees organized for the purpose it arbitrates disputes between members and between members and non-members upon the request of the parties concerned. The coordination of the above-mentioned functions is the responsibility of its staff who, in addition, implement the policy decisions taken by the Board of Directors.

Table 5

TRADING VOLUMES FOR FUTURES AND OPTIONS (GRAIN AND RELATED PRODUCTS) AND OPEN INTEREST IN UNITED STATES MARKETS

(Thousands of contracts)

	Total trading volume					Open interest (monthly)				
	CBT	MACE	KCBT	CRCE	MGE	CBT	MACE	KCBT	CRCE	MGE
					Futures					
1985-1986										
Wheat	2 190	355	758	-	290	33.7	7.2	16.9	-	5.4
Corn	6 188	410	-	-	-	121.6	11.4	-	-	-
Oats	121	2	-	-	-	3.6	0.1	-	-	-
Soybeans	6 715	774	-	-	-	70.0	10.4	-	-	-
Soybean oil	3 167	-	-	-	-	54.2	-	-	-	-
Soybean meal	3 136	7	-	-	-	48.3	0.5	-	-	-
Rice	-	-	-	1.19	-	-	-	-	0.26	-
1986-1987										
Wheat	1 813	201	46	-	295	32.0	6.0	17.8	-	4.9
Corn	7 177	331	-	-	-	131.2	8.8	-	-	-
Oats	262	7	-	-	-	5.9	0.2	-	-	-
Soybeans	6 560	448	-	-	-	81.1	9.3	-	-	-
Soybean oil	3 732	-	-	-	-	74.9	-	-	-	-
Soybean meal	3 409	3	-	-	-	59.8	0.2	-	-	-
Rice	-	-	-	13.89	-	-	-	-	0.63	-
					Options					
1985-1986										
Wheat	-	8.9	18.7	-	4.8	-	1.0	2.0	-	0.6
Corn	560	-	-	-	-	53.5	-	-	-	-
Soybeans	863	8.5	-	-	-	50.7	2.0	-	-	-
Soybean oil	-	-	-	-	-	-	-	-	-	-
Soybean meal	-	-	-	-	-	-	-	-	-	-
1986-1987										
Wheat	104	1.7	30.4	-	1.3	7.7	0.2	3.5	-	0.2
Corn	661	-	-	-	-	53.1	-	-	-	-
Soybeans	1 032	11.2	-	-	-	60.4	27.2	-	-	-
Soybean oil	61	-	-	-	-	8.9	-	-	-	-
Soybean meal	53	-	-	-	-	6.9	-	-	-	-

Source: CFTC, Annual Report, 1987.
Note: See table 2. Chicago Rice and Cotton Exchange contracts are for 20 000 pounds of unmilled rice.

Table 6

DATES OF INTRODUCTION AND OFFICIAL AUTHORIZATION OF CONTRACTS FOR VARIOUS GRAINS AND RELATED PRODUCTS**

Markets/products	Starting date of trading	Date officially authorized
- CHICAGO BOARD OF TRADE		
Futures		
Corn	1859	March 1923
Wheat	1859	March 1923
Oats	1859	March 1923
Soybeans	October 1936	December 1940
Soybean oil	July 1950	June 1950
Soybean meal	August 1951	August 1951
Sunflower	(not traded)	November 1981
Options		
Soybeans	October 1984	October 1984
Corn	February 1985	January 1985
Wheat	November 1986	September 1986
Soybean oil	February 1987	October 1986
Soybean meal	February 1987	October 1986
- KANSAS CITY BOARD OF TRADE		
Futures		
Corn*	1879	May 1923
Sorghum*	January 1916	May 1923
Hard winter wheat	1877	May 1923
Soybeans*	September 1956	September 1956
Options		
Wheat	October 1984	October 1984
- MINNEAPOLIS GRAIN EXCHANGE		
Futures		
Barley	October 1918	May 1923
Corn*	January 1922	May 1923
Oats*	January 1982	May 1923
Rye*	January 1918	May 1923
Spring wheat	1855	May 1923
White wheat	September 1984	August 1984
Linseed*	May 1923	July 1920
Soybeans*	September 1950	September 1950
Sunflower*	July 1950	June 1980
Options		
Spring wheat	October 1984	October 1984
- MID-AMERICA COMMODITY EXCHANGE		
Futures		
Corn	Before 1800	May 1923
Oats	Before 1800	October 1922
Wheat	Before 1800	October 1922
Soybeans	October 1936	December 1940
Soybean meal	March 1985	April 1985
Options		
Wheat	October 1984	October 1984
Soybeans	February 1985	January 1985
- CHICAGO RICE AND COTTON EXCHANGE		
Futures		
Corn*	October 1982	October 1982
Rice (milled)*	April 1981	February 1981
Rice (unmilled)*	April 1981	April 1981
Soybeans*	October 1981	October 1981

Source: CFTC, Annual Report, 1907.
Notes: * Contracts not traded within the last six months.
** As of 31 December 1987.

Members: The CBT has 1 402 full members, in addition to associate members and those having membership interests in financial and options markets. The number of members in each category as of 31 December of 1986 and 1987 was (CBT, 1987):

	1986	1987
Full members	1 402	1 402
Associate members	699	713
Holders of membership interests	1 321	1 370

Full members can trade all the futures contracts of the CBT and the Mid America Commodity Exchange (MACE) and have full privileges on the Chicago Board Options Exchange (CBOE); they have voting rights and may sit on exchange committees.

Associate members may trade all the futures contracts of the CBT and designated contracts on the MACE, but they do not have full trading privileges in the CBOE; they may vote (with 1/6 of the weight of a full vote) and may sit on the exchange's committees.

The holders of membership interests in the Government Instruments Market (GIM), Commodity Options Market (COM) and Index of Debt and Energy Market (IDEM) may trade contracts in these markets (see annex), but they do not have voting rights and can participate on exchange committees only as advisors.

Any person over 21 years of age who is not employed by the exchange and whose reputation, character, and financial and credit standing satisfy the requisites defined by the Membership Committee and the Board of Directors may become an exchange member in any of the three categories mentioned by acquiring the corresponding membership rights in the market. These rights are traded openly on the exchange and their value has varied over time (as of mid-1988, the shares required to purchase a seat as a full member were selling at between US$400 000 and US$500 000). Trading privileges may also be acquired in the CBT by renting a seat in any of the categories mentioned.

The Board of Directors: This is the governing body of the exchange and is made up of 24 persons: the Chairman and the Vice Chairman of the Board, the President and Chief Executive Officer (non-voting), 15 Directors elected from among the exchange's full members, three elected from among its associate members and three non-members (proposed by the President and Chief Executive Officer).

Committees: The CBT has a large number of committees which report to the Board of Directors and are made up of full members, associate members and some of the exchange's executive officers. The committees existing at present are concerned with the following matters: nominations, business conduct, the supervision of floor

brokers, membership, arbitration, appeals, the executive board, advisory services for the Board, associate members, spot grain, commodity options, computer services and telecommunications, education, feed grains, wheat, soybeans, soybean oil, soybean meal, finance, financial instruments, energy, financial instruments membership, floor brokers, business conduct on the floor, forestry products, long-term planning, margins, marketing, information, public relations, regulations, weights and custody, grain-elevator firms, new products, metals, real estate, statistics, exchange indexes, CNMA-CDR and transport.

Staff: The CBT has a staff of more than 500 persons. These staff members, who are not members of the exchange, include 20 executive officers, headed by the President and Chief Executive Officer and the Executive Vice President, who are designated by the Board of Directors. The Executives are responsible for the following areas: Information Systems, Special Council, General Council, Public Relations, Education and Marketing Services, Economic Analysis and Planning, European Operations, Investigations, International Market Development, Real Estate Operations, Technology Application, Treasury, Government Relations, Floor Operations and Personnel Planning and Development.

Attached is a list of the Directors and Executive Officers for the year 1987.

b) The clearing corporation or clearing house

The need for an entity that would be responsible for the registration and settlement of contracts increased as trading volumes grew. Initially, the commission houses assumed the responsibility of determining the daily sums of net long and short positions and open interest at the end of each day and of recording these positions in their books. Every morning, prior to the opening of the trading session, these entries were cross-checked between the different houses and, if everything balanced, the session could be opened. In 1883 a consolidated accounting system was developed that operated until 1925. During this period, two methods for closing out accounts were used:

i) A direct method of adjustment was used when the buyer and seller participating in each operation could be clearly identified. In this case the party registering a loss on an open position sent a check to the Clearing House (at that time it was a department of the CBT) for the amount of the loss, which was then credited by that department to the party realizing a gain on the corresponding position.

ii) The ring method of adjustment consisted of an accounting system whereby a series of buyers' and sellers' accounts were grouped together in such a way that their accounts could be closed

prior to shipment. Each such group or "ring" was made up of buyers and sellers of similar amounts of the same merchandise for the same delivery month. During this period, each day's adjustment price was determined by the exchange at the close of the session, and the books did not reveal the total number of contracts traded each day; the volume and the amounts of open interest remained secret.

In 1925 the Chicago Board of Trade Clearing Corporation was organized as an independent clearing house. At present, it is made up of 145 firms that are also members of the exchange. The Clearing Corporation adjusts the accounts of each of these firms at the close of every trading day by setting off the amounts purchased against the amounts sold. While every member of the Clearing Corporation must be a meber of the exchange, not all exchange members belong to the clearing house. The clearing house is an open corporation but in order to belong to it an exchange member must have very solid economic backing and a reputation deemed to be worthy by the Board of Directors of the Clearing Corporation. Different types of exchange members may belong to the Clearing Corporation (individuals, members of associations, corporations and cooperative organizations).

As a form of protection for all members, the Board of Directors of the Clearing Corporation establishes maximum limits on the number of contracts that each firm may liquidate at any one time, as well as different initial margins per contract for positions that exceed a certain level. The members of the Clearing Corporation must deposit not only the original margins[5] and subsequent margin calls, but also a guaranty, or security deposit that may not be used during the period of their membership. The size of this deposit may vary, according to the member, between a few thousand dollars and more than US$50 000; it must be deposited in cash and remains at the disposal of the clearing house as a reserve fund to cover any obligation arising in the event of non-compliance by that or other members. The clearing house may deposit the reserve funds and thus accrue interest on its own behalf. The clearing house is financed by the commissions charged on contract settlements and for other services provided to its members, as well as by the income derived from the temporary investment of the members' deposits.

The solid financial position of the clearing house is ensured by its strict membership eligibility criteria, its own funds, and the fact that the resources of members may be requisitioned, if necessary, to solve any critical problem. Thus the Clearing Corporation is in a position to guarantee that each contract which it accepts for settlement will be honoured. It should be noted that in the history of the clearing house there have been very few cases of non-compliance and there has never been a case where a default by a clearing house member has made it impossible for that clearing house to fulfil the financial obligations arising from trading operations. If a client of a commission house is unable to fulfil

his financial obligation or meet a delivery commitment with the Clearing House, the corresponding obligation must be assumed by the commission house, which uses its own resources to cover its client's default. This is why brokers insist that margin calls be deposited immediately upon request and why commission houses authorize their brokers to liquidate all the positions of clients who do not promptly deposit the required margins.

The boards of directors of these clearing houses set the amounts of the initial margins required for each open contract and the deposit of margins is the obligation of the members of the clearing house, rather than of the clients. Given that the exposure of each member of a clearing house depends on its net position in each contract, rather than on the aggregate positions -short or long- of all its clients (CBT, 1985), the Clearing Corporation of the Chicago Board of Trade requires coverage only of the net position in each contract, which is calculated by setting off long and short positions, and margin deposits therefore cover only the uncleared balance.

The clearing house is also responsible for the adjustment of profits and losses for or against the accounts of the clients of its members. At the close of the trading session, the quotations committee compiles a list of the daily settlement prices for each delivery month. These prices are usually within the range of the trading prices at the close of the session, but if a particular contract for a specified delivery month was not traded, the committee sets a nominal price -taking into account the prices of the other delivery months that were traded-, which is supposed to represent the average between offers and orders for this contract at closing. Based on these settlement prices, the firms belonging to the clearing house pay to it, or receive from it, the variation margins corresponding to the open positions of their clients. The commission house thus receives the money that permits it to pay clients who realized gains and must pay the clearing house -from its own resources or using funds deposited by its clients- to cover the losses incurred by clients during the day. All variation margins called for on the basis of each day's settlement prices must be paid to the clearing house by its member firms prior to the opening of the following day's trading session. Normally, the initial margins are sufficient to cover the maximum authorized daily fluctuations, but if a market is very volatile and a particular member holds a large number of positions, the clearing house may request that firm to deposit additional margins, known as "margin calls", during the session. Margin calls must be paid within one hour from the time the call is made and are credited to the corresponding member in the daily resettlement; in other words, they are not incorporated into the initial margin.

Procedures for the settlement of accounts are begun following the close of each day's session. All members of the clearing house must, at the close of trading, provide it with a complete list

(which includes prices) of all purchase and sale transactions made by their clients. The law prohibits the concealment of purchase and sales transactions arranged by the same commission house (there might be a variety of motives for doing so, including the evasion of clearing house commissions) and stipulates that all contracts must be cleared. Once the clearing house has verified the correctness of all the reported transactions,[6] it assumes the legal and financial obligations of the "other party" to all transactions; in other words, the clearing house becomes a buyer to every seller and a seller to every buyer. Thus, buyers and sellers in futures markets are not directly linked to each other, but rather to the clearing house through the intermediary of a commission house that is a member of the clearing house; thus, they are able to liquidate contracts (through an offsetting operation) at will, without having to wait for an agreement to be reached between the two original traders. They buy from and sell to the clearing house, which always acts as the "other party".

Information handled by the clearing house is highly confidential and therefore access to it is very limited. Among the executive officers of the clearing house, usually only the Chairman, Vice Chairman and Secretary have access to the information concerning transactions, open positions and the files of its members.

c) The commission house and floor brokers

A commission house is a firm that trades contracts on behalf of the various types of users of futures markets (hedgers and speculators). Although the members of the exchange are individuals rather than firms, the commission houses acquire the status of member firms when one of their employees (executives) or shareholders registers his membership as being on behalf of or for the benefit of such houses (companies, corporations, etc.). Some of these firms have international subsidiaries or branches which trade in all types of financial assets; others are primarily involved in commodity and stock markets; while still others operate only in commodity markets, where they specialize in hedging or speculation. Their networks of branch offices and communications systems permit them to channel business from distant cities and other locations throughout the world. Independently of their size, their name and the scope of their activities, the basic function of the commission houses is to serve as market representatives of the interests of firms or individuals who are not members of the exchanges; they perform this function by executing orders, collecting or paying margins, keeping the corresponding accounts and advising clients on their trading programmes. As compensation for the administration of each trading operation, the commission house charges a fee.

Although not all futures purchase or sell orders executed on the floor of the exchange pass through a commission house, since

some are transmitted directly by the client to the floor brokers (who, in certain cases, are also members of the clearing house), a substantial number are arranged through this channel. The clients of a commission house may be: a) individual speculators, b) firms that hedge on the exchanges, c) floor brokers who are not members of the clearing house and who wish to use the contract settlement services provided by the commission house and d) other commission houses that are not members of the Clearing House or are not members of the exchange, or are not members of either of the two. The rules of the exchange require that the commission house know each of its clients well, to which end it must obtain the required information through accredited representatives. It may be penalized by the exchange if it does not fulfil this requirement. In addition, official regulations oblige the commission houses to hold the margin deposits of their clients in separate bank accounts, which are independent of their deposits of their own funds, in order to ensure that any poor business deal made by a commission house does not adversely affect its clients. Margin deposits may not be used to cover a firm's obligations to its creditors, but only to cover requirements of the clearing house.

The exchange sets initial margins and the minimum levels of subsequent margins for the accounts of speculators and non-speculators; the commission house may, however, establish higher requirements for its clients on an individual basis. Each commission house is responsible for the prompt fulfilment of margin deposit requirements by its clients and must deposit the margins required by the clearing house on the open positions of its clients.

Most client transactions are administered by the account executives employed by such firms. Owing to the nature of the activities they perform, account executives must (unless they are exchange members) pass an examination instituted by the CBT in 1966, must work exclusively for the commission house (if they are employed in the United States or Canada) and cannot engage in any transactions other than those administered by their office without prior authorization. These employees perform the following duties: i) provide documentation for the opening of new accounts; ii) explain trading rules and procedures to their clients; iii) inform clients concerning market prices and conditions; iv) register trading orders and transmit them to an employee on the exchange floor; v) report the execution of orders and the prices in question; vi) serve as a liaison between the client and the firm's research department; vii) request the deposit of margins; and viii) monitor clients' performance with respect to their responsibility and integrity.

Any member of the exchange may trade in the pit as a floor broker. He may operate on his own behalf or on that of any other member of the exchange and may sell to, or buy from any other member of registered broker. The floor broker is liable for all

losses occasioned by any errors he may commit in the handling of his clients' orders. He is prohibited from realizing non-competitive operations and may be suspended if he is found to have participated in a transaction not authorized under the rules of the exchange. In order to engage in trading activity he must annually obtain an official permit and be registered with the National Futures Association, which is the body that, by order of the Commodity Futures Trading Commission, has been responsible for the registration of traders since 1984.

d) Regulatory agencies and provisions

The grain exchanges of the United States, and particularly the CBT, have an extensive body of rules and regulations concerning the operation of these markets. During the first 70 years following the initiation of futures trading in the mid-nineteenth century, there were no official regulations governing this activity. The CBT regulated these markets on its own, placing special emphasis on the development of rules designed to ensure competitiveness, access, efficiency and liquidity on the basis of rigorous standards of trade ethics. The first state and federal laws relating to futures markets were based on the rules developed by the exchanges (examples include the law concerning storage facilities enacted by the State of Illinois 1871 and the Federal Grain Standards Act of 1916).

On several occasions attempts were made to abolish futures markets, due to the fact that producers and consumers protested whenever there were price variations that could not be immediately accounted for. In 1884 and 1893 bills were sent to Congress for the purpose of abolishing them, but ultimately they were voted down. In the late nineteenth century the importance of futures markets came to be recognized, and attempts to abolish them thereafter gave way to efforts to regulate their activities. The first national law for regulating futures activities was promulgated in 1921 in response to criticisms made as a result of the heavy speculation in grain that took place at the end of the First World War; soon after, however, this law was declared unconstitutional by the Supreme Court of the United States. In September 1922, it was reintroduced in the form of the Grain Futures Act of 1922, which was based on the constitutional power of Congress to regulate inter-state commerce. This law authorized the government to deal directly with the exchanges, rather than only with its members, and limited futures operations to the exchanges and to officially authorized contracts; as a condition for this provision, the exchanges were required to assume the primary responsibility for preventing the manipulation of the market by their members or employees. This regulation proved to be less than fully effective owing to its limitations and to the fact that the only recourse for preventing manipulation was the suspension of members, which was considered to be too extreme. The most positive aspect of this law was that it

gave rise to various studies and investigations which contributed to a better understanding of futures markets and, in particular, of possible sources of distortion; the exchanges were also able to demonstrate that the activity of futures markets was in the public interest.

At the suggestion of the United States Department of Agriculture (USDA), Congress reviewed the existing legislation and, in 1936, passed a new law, the Commodity Exchange Act of 1936, which broadened official regulatory powers and expanded the list of regulated commodities. One of its provisions resulted in the creation of the Commodity Exchange Commission, composed of the Secretaries of Agriculture and Commerce and the Attorney General of the United States, for their representatives. The Commission was the agency responsible for administering the law from 1936 to 1947. However, although this commission was specifically authorized to regulate futures markets, it did not have its own offices or employees, and its authority and functions were therefore exercised through the Commodities Exchange Authority (CEA), a specialized agency of the USDA. The law permitted the CEA to deal with cases of abuses committed by exchange members and by traders, to prosecute cases of price manipulation as a criminal offence, to limit the scale of operations of large speculators and to extend its regulatory functions to include commission houses, as well as brokers. The CEA was also responsible for providing the public with information on futures markets.

In 1947 it was decided that the CEA would directly administer the provisions of the Commodity Exchange Act of 1936. The main functions fulfilled by the CEA may be grouped into the following categories:

- Granting licenses to the exchanges for operating in the various types of commodity futures and in different types of futures contracts;
- Registration of commission houses and brokers;
- Analysis of the financial capacity and stability of members trading for the public;
- Protection of clients' funds;
- Setting the limits on daily trading volumes and on the size of large operators' positions;
- Day-to-day supervision of trading activities on the exchanges;
- Provision of statisticsl and other information to the public concerning the operations taking place in authorized futures markets;
- Monitoring compliance with all provisions of the Act and penalizing violators;
- Periodic auditing of the commission houses.

Although on various occasions the CEA requested that Congress authorize it to regulate the size of margin requirements, Congress

refused to do so because it felt that the exchanges were in a better position to perform this function.

Between 1936 and 1968 various amendments were made to the Commodity Exchange Act which lengthened the list of regulated products and permitted close monitoring of market operators. During this period many charges of market manipulation were made against both individuals and trading firms served as test cases that established legal precedents in this area, since Congress had not defined manipulation or other activities leading to price distortions but had instead left this to the interpretation of the courts.

The 1968 amendments to the Act involved some significant changes, among which were the establishment of minimum financial standards for commission houses, an increase in the penalties for certain violations (such as manipulation) and the requirement authorized exchanges regulate their own activities, reinforce their trading regulations and their rules concerning the terms of the contracts.

The synthesis, the Commodity Exchange Act of 1936 was designed in order to:

- Ensure that the regulations of the exchanges would strengthen competition in commodity trading;
- Prevent price distortions; and
- Protect the public from fraud and uncompetitive prices.

The sharp price swings observed in 1973 and 1974, as a result of imbalances between world supply and demand led to renewed concern as to the adequacy of the official regulations governing futures markets in the United States, and political pressure was exerted to expand controls and lengthen the list of regulated commodities and other goods. In spite of these concerns, the debates held in Congress led to the approval, in 1974, of a new law, the Commodity Futures Trading Act of 1974, that was based on a different philosophy from that which had guided the legislation framed during the previous 50 years, in that it modified the anti-speculator bias of the Commodity Exchange Act of 1936 and its predecessors; this bias was also present in the regulations of the exchanges norms, owing to the influence of some of their members who considered speculative activity to be something undesirable or, at best, a necessary evil for providing these markets with liquidity. It was precisely this view that sparked numerous debates and gave rise to studies that clarified the functions and roles of speculators. The 1974 Act reflected the conclusions of these studies, which fostered a more favourable attitude towards the economic advantages of futures markets and speculation. Thus, the mandate of Congress became the promotion of the growth and development of these markets.

The 1974 Act also created the Commodity Futures Trading Commission (FTC), an independent agency that replaced the USDA's Commodity Exchange Authority. The CFTC, which initiated its activities in April 1975, has five full-time directors who are nominated by the President of the United States for five-year terms and must be confirmed by the Senate. A law enacted in 1978 extended the life of the Commodity Futures Trading Commission for an additional four years, expanded its jurisdiction and clarified some of the provisions of the Commodity Exchange Act. In this regard, it extended the term "commodities" to cover all goods, articles, services, rights and interests that were being traded in futures markets at that time or which may be traded in the future.

For a long time many states, including Illinois, prohibited the trading of options in commodity futures markets. The Commodity Exchange Act prohibited the trading of options on products subject to its regulation, but in 1982 the CFTC approved the trading of options on non-agricultural products. The Futures Trading Act of 1986 partially modified 1982 commodity exchange legislation and is the central piece of legislation in effect in this area today (Commerce Clearing House, Inc. 1987). This Act requires that futures markets shall not harm the public interest and, to this end, that the CFTC shall monitor the use of futures for price formation and hedging.

One of the first activities required of the CFTC was to broaden the definition of "good-faith hedging" so as to permit anticipatory hedging and cross-hedging. The act also requires the exchanges to submit their trading rules and contract terms and conditions to the CFTC for its approval, and the CFTC must review them for the purpose of analysing their impact on the competitiveness of these markets; it permits the CFTC to change the regulations of an exchange if, following due notification, the exchange fails or refuses to do so voluntarily; it requires that rules having economic implications be published in the Federal Register for public comment; and it authorizes the CFTC to review any activities of the exchanges which limit the entry of members or other access privileges and empowers it to change or set aside the decisions of the exchanges. The 1986 Act maintains those provisions of the 1936 Commodity Exchange Act which authorize the CFTC to establish minimum financial requirements for commission houses and require that such firms keep separate accounts for funds deposited by their customers.

The CFTC may take emergency measures in the markets under certain conditions; these include an impending attempt at manipulation as well as other events that prevent the market from reflecting supply and demand. The 1986 Act also increased official regulatory powers in respect of brokers, commission houses and their representatives, and other market consultants.

The exchanges and their clearing houses must register the trading operations conducted during each day's session and this information must be provided to the CFTC. Markets authorized to operate in futures must also make each day's trading volume before the opening of the market on the following day. On the basis of the information sent to the CFTC, its technical experts closely monitor the operations of the main firms for the purpose of identifying, in advance, possible attempts at market manipulation or fraud.[7] The CFTC's ongoing monitoring of the main traders and its practice of cross-checking its information on futures with additional data on physical markets help to ensure that futures markets fulfil their important functions in the national and international economy as regards the formation and dissemination of prices, as well as in the provision of hedging cover.

The CFTC is headquartered in Washington, D.C. and has regional offices in Chicago, New York, Kansas City and Los Angeles, as well as a subsidiary bureau of the Kansas City office which is located in Minneapolis. It has three staff divisions:

- Law enforcement
- Economic analysis
- Trading and markets.

The first division investigates and prosecutes alleged violations of the Futures Trading Act and CFTC regulations. Such violations include illegitimate forms of futures and options trading in commodity futures markets, as well as the illicit trading of commodities and financial instruments falling within the jurisdiction of the CFTC. The Economic Analysis Division programmes market monitoring, analysis and research for the purpose of maintaining the competitive character of futures and options markets and preventing the disruption of the market by manipulation or congestion; to this end it includes a section that engages in systematic follow-up activities which enables it to implement on-the-spot corrective measures. The Trading and Markets Division monitors trading practices and the enforcement activities of the self-regulated organizations (the 14 exchanges and the National Futures Association). In addition it audits and reviews the financial situation and practices of the commission houses and other registered traders, and studies possible reforms of the rules of the exchanges and the National Futures Association.

In 1984 the CFTC entrusted the National Futures Association, which is a private body, with the responsibility for registering traders, pool operators and market consultants who operate on the exchanges.

II. DESCRIPTION AND ANALYSIS OF THE ROLES AND FUNCTIONS OF THE GRAIN EXCHANGES AS THEY RELATE TO THE LATIN AMERICAN AND CARIBBEAN COUNTRIES' EXPORTS OF THE PRINCIPAL GRAINS AND RELATED PRODUCTS

1. Mechanisms for export price determination in the United States and the Latin American and Caribbean countries

a) International markets: contractual forms

For many years the main destination of world exports of grain and related products was the European Economic Community (EEC) and specifically the port of Rotterdam. Since the Rotterdam market was the main centre for the international grain trade, its prices (CIF) constituted the main reference point for international prices throughout the world. In recent decades, however, world commodity trade flows have changed, especially in the case of grain, as a result of the combined effect of two factors:

i) The EEC's gradual attainment of self-sufficiency in foodstuffs as a consequence of its Common Agricultural Policy, which in recent years has converted it into a net exporter of grain; and

ii) The steady growth of demand and of the imports of the Eastern countries, Japan and most of the developing countries, in which production increases have not kept pace with the growth of domestic consumption.

This trend, which specialized agencies predict will continue during coming decades, has contributed to a modification of the pattern of imports and exports (see tables 7, 8, 9 and 10). Most exports come from a few countries (mainly the Western industrialized nations —United States, Canada, Australia and the EEC— and, to a lesser extent, Argentina and Brazil), whereas a large number of countries are importers, particularly the developing countries and the countries of the Far East, where CIF markets such as that of Rotterdam have not been developed,[8] since most of them import through official agencies or offices (as is the case of the Latin American countries). Multinationals, private firms or national co-operatives and the official agencies (usually called Grain Boards) of some exporting countries —Argentina, Australia, Canada, South Africa, etc.— sell to these importing

Table 7

DISTRIBUTION OF WHEAT IMPORTS, BY GROUPS OF COUNTRIES

(Percentages)

	1969/1971	1979/1981	1984	2000
Industrialized	31.90	18.66	15.08	11.21
EEC (12)	21.44	11.42	9.08	5.79
Japan	8.69	5.87	5.19	3.67
Centrally planned	12.69	21.95	26.60	18.62
USSR	3.15	16.45	23.68	16.31
Eastern Europe	9.59	5.51	2.91	2.30
Developing	55.95	59.38	58.29	70.17
Asia	30.62	29.73	27.19	42.25
China	7.18	12.38	6.83	16.64
Africa	12.09	15.08	18.40	15.32
Egypt	4.67	5.59	6.32	4.47
Americas	10.96	12.04	10.85	9.67
Brazil	3.33	4.52	4.42	3.96
World	100.0	100.0	100.0	100.0

Source: World Bank, Price Prospects for Major Primary Commodities, Washington, D.C. (various issues).

Table 8

DISTRIBUTION OF IMPORTS OF COARSE GRAIN BY GROUPS OF COUNTRIES

(Percentages)

	1969/1971	1979/1981	1984	2000
Industrialized	73.04	42.89	35.58	28.54
North America	1.47	1.24	1.22	0.84
United States	0.71	0.25	0.73	0.33
EEC (10)	49.43	29.54	14.93	8.37
Western Europe (other)	1.43	1.36	0.72	-0.11
Japan	20.71	16.75	18.63	19.43
Centrally planned	10.66	27.13	26.78	31.80
USSR	3.16	18.49	23.77	19.13
Eastern Europe	7.50	8.64	3.02	12.67
Developing	16.29	29.97	37.64	39.66
Asia	6.57	13.16	18.65	26.29
China	0.28	1.25	0.18	6.24
Africa	1.43	3.74	6.23	6.21
Americas	3.16	8.43	8.64	5.52
Mexico	0.77	4.51	4.21	2.88
Southern Europe	5.12	4.65	4.07	1.64
World	100.00	100.00	100.00	100.00

Source: World Bank, Price Prospects for Major Primary Commodities, Washington, D.C. (various issues).

Table 9

DISTRIBUTION OF SOYBEAN IMPORTS (PROTEIN MEAL), BY GROUPS OF COUNTRIES

(Percentages)

	1969/1971	1979/1981	1984	2000
Industrialized	83.19	68.77	65.70	61.30
North America	3.86	1.93	1.91	1.09
EEC (10)	59.12	54.59	52.37	50.63
France	7.59	8.95	8.80	8.51
Germany	17.49	12.45	10.61	11.22
Netherlands	9.15	9.70	8.75	8.79
Western Europe (other)	3.19	2.68	2.41	2.09
Japan	16.74	9.52	8.94	7.37
Centrally planned	7.53	14.41	12.75	15.97
USSR	0.00	3.79	2.62	5.87
Eastern Europe	7.53	10.62	10.13	10.10
Developing	9.36	16.81	21.55	22.73
Asia	4.20	8.22	10.13	10.92
Americas	1.69	4.98	6.41	5.71
Southern Europe	3.39	3.02	3.65	3.52
World	100.00	100.00	100.00	100.00

Source: World Bank, Price Prospects for Major Primary Commodities, Washington, D.C. (various issues).

Table 10

DISTRIBUTION OF IMPORTS OF SOYBEANS (OIL EQUIVALENT), BY GROUPS OF COUNTRIES

(Percentages)

	1969/1971	1979/1981	1984	2000
Industrialized	67.90	51.77	43.73	46.42
EEC (10)	43.58	38.14	31.1	35.9
Germany	12.16	9.57	7.11	4.46
Netherlands	7.09	7.73	6.26	7.21
Spain	7.09	6.42	5.06	8.93
Western Europe (other)	3.38	2.62	2.05	1.79
Japan	17.57	9.57	9.4	8.16
Centrally planned	2.36	6.29	4.93	7.59
USSR	0.00	3.93	2.65	5.00
Developing	29.39	41.80	31.90	46.04
Asia	15.54	23.19	27.22	27.23
India	2.70	8.52	9.16	7.34
Pakistan	3.04	3.28	7.71	3.19
Americas	4.01	0.52	11.69	7.14
Southern Europe	5.1	4.45	6.5	3.95
World	100.00	100.00	100.00	100.00

Source: World Bank, Price Prospects for Major Primary Commodities, Washington, D.C. (various issues).

countries directly or, in some cases, by means of unsystematic bidding. Most of these transactions are secret and the sale prices are not made public, but can only be indirectly estimated on the basis of market prices in the countries of origin.

These circumstances have contributed to the increasing importance of non-monopolistic FOB exporting markets as indicators of international market prices, as well as to the practice of basing inter-country competition on comparisons between the FOB prices of different points of origin, to which the transport costs to the country of destination are then added.[9] In fact, a very high proportion of world trade is now conducted on an FOB basis; this is the case of most exports from the United States, Brazil and Argentina, which have developed large FOB markets over the last three decades at their principal grain ports. The FOB markets of the United States, Brazil, Argentina, France, etc., are non-institutional markets and do not have any physical facilities; business transactions are carried out by telephone or telex, either directly with the countries of destination (FOB offers to buyers) or with other exporters who buy on the FOB market for resale to the final delivery points. The sales are conducted directly between traders or through brokers specializing in the FOB market.

FOB contracts are usually forward contracts in which payment is made upon delivery (in a few cases they are used for spot transactions). Therefore, FOB contracts specify: i) the delivery point (in the hold of a ship at a specified port); ii) the quality or grade of the grain or related product to be shipped (each contract may contain different requirements with respect to commercial grade, sanitary conditions, etc., depending on the needs of the buyer and the supplies of the exporter); iii) the quantity; iv) the time of shipment; v) the loading schedule; and vi) the price. Unlike futures contracts, these contracts usually do not involve any security deposit or performance bond but instead rely entirely on the integrity of "the other party" which makes them more risky. For this reason, the participants in the FOB market are far fewer in number than in futures markets and are limited to long-standing firms that know each other; thus, the speculators characteristic of futures markets are not found in this market.[10] The FOB markets are also less liquid, since the contracts call for different quantities, qualities, delivery points, loading schedules, etc. Finally, they are less transparent as well because not all operations are made known or publicly announced by a market institution, and the different specifications sometimes limit the representativeness of their prices. (For example, the sale prices of Argentine wheat for shipment to Brazil incoporate the fact that the loading schedule is twice as rapid as it is for other Latin American delivery points and penalties are imposed for time overruns.)

Due to off shore and non-institutional nature of FOB markets, individual countries do not have legal jurisdiction over them and the full extent of operations in these markets is unknown, especially with respect to private FOB resales, which represent a very considerable volume of trade for some countries. Indeed, in exporting countries such as Argentina and Brazil, foreign trade in grain and related products may take a variety of forms as regards the agents participating in such transactions as buyers and sellers; the first external sale (which is legally registered as an export in the country of origin) may involve any of the following parties:

Seller	Buyer
Export firm	Importing country of destination
Grain board	Importing country of destination
Export firm	Other exporting firm Grain board
Grain board	Exporting firm

The third of these possibilities is the option which permits the widest array of traders to participate in FOB transactions, especially when private firms are involved; this alternative makes export operations feasible for small private firms and national co-operatives which have comparative advantages as grain suppliers (a good storage and bulking network within the country), but do not have ready access to the importing markets. Large multinationals, on the other hand, usually have a marketing infrastructure and greater access to importers, but are the original source of only a portion of the grain and buy the rest in the FOB market from other firms (some of which are cooperatives and small trading firms).

b) Reference prices

FOB prices are a reflection partially of the quotations for initial sales to other countries and partially of the prices for resales in the FOB market, which are usually associated with sales to a final delivery point arranged by other firms that, for various reasons, are not the source of the merchandise. FOB prices may be expressed in dollars per ton as a flat price or in terms of premiums or discounts on the quotations of a futures market that is used as a reference point. In the latter case, the final price of the transaction is not known at the time the sale is agreed upon, since it will depend on how prices change in the reference market between that time and the date when the price is fixed.[11] This procedure is widely used for exports of oilseed products (soybeans, soybean and sunflower oil and soybean meal), from the United States, Argentina and Brazil; it is also frequently used for

longer-term sales of grains such as corn, sorghum and wheat. Chicago is the main reference market for soft wheat, corn, sorghum, soybeans, sunflower and soybean oil and soybean meal while Kansas is the primary reference market for hard wheat. The futures contracts used in these cases are normally those immediately preceding the shipment month.

Recognition of these trading practices in Argentina and Brazil (the main grain exporters of the region) (see table 11) has prompted the public agencies responsible for recording exports by these countries to monitor the United States futures markets on a daily basis, and these markets now serve as the frame of reference for the recording of those exports. In Argentina, the laws pertaining to sales of grain and related products require exporters to declare their external sales as soon as the corresponding arrangements have been made at, as a minimum, the prevailing "floor index and/or FOB prices"; these prices are adjusted daily by the National Grain Board (JNG) after the close of the Kansas and Chicago markets, taking into account, among other variables, the quotations on those markets and the premiums corresponding to the local market on that day.[12] Although for the time being such declarations can only be based on flat prices, the JNG is studying the possibility of authorizing the registration of exports in terms of premiums on Chicago market quotations for some oilseed products (soybeans, soybean and sunflower oils and soybean meal), as has been requested by the associations representing the Argentine edible oil industry. In Brazil this process is even further advanced, in as much as the import-export permits granted by the authority responsible for foreign trade (CACEX) can be denominated in premiums on the quotations of the Chicago market.

c) Price relationships between international markets

The importance of the United States in the international trade of grain and related products has been a decisive factor in defining contractual modalities and forms of competition throughout the world. The fact that United States export prices are calculated in terms of premiums on the quotations of their exchanges, as are its domestic market prices, led to the adoption of similar procedures for the export prices of the Latin American countries, which are also based on exchange quotations in the United States. Export prices at United States ports (those on the Gulf of Mexico being the most significant as regards competition with Latin American and Caribbean exports) are determined in terms of the "basis", which is the difference between the cash price at the delivery point and the quotation in an exchange for the futures position (delivery contract) for the closest or specified delivery month. In the United States market, there is a day-to-day pricing system which links all delivery points (inland and ports of shipment) with the futures markets so that the basis for each delivery point can be determined. As explained by Hieronymus

Table 11

PRINCIPAL GRAIN-EXPORTING COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN

Country	Wheat			Corn			Soybeans			Feed Grains*		
	1985	1986	1987	1985	1986	1987	1985	1986	1987	1985	1986	1987
Argentina	4.30	4.40	5.60	7.40	4.00	4.20	2.90	2.60	1.30	9.40	4.90	5.60
Brazil	-	-	-	0.40	0.40	0.40	3.50	1.20	3.30	0.04	0.04	0.04
Uruguay	0.04	-	-	0.04	0.03	0.02	-	0.04	0.03	0.13	0.12	0.11
Paraguay	-	-	-	0.01	0.01	0.01	0.80	0.50	1.00	0.01	0.01	0.01
Mexico	-	-	0.10	0.05	0.05	0.05	-	-	-	0.05	0.05	0.05
South America (other)	-	-	-	0.07	0.05	0.04	-	0.06	0.04	0.19	0.15	0.15
Central America	-	-	-	0.02	0.03	0.01	0.01	-	-	0.02	0.03	0.01
Total	4.34	4.40	5.70	7.99	4.57	4.73	7.21	4.40	5.67	9.84	5.30	5.96

Source: United States Department of Agriculture.
* Includes corn.

(1978), on any given day it is therefore possible to have a functionally interrelated pricing system; for example, on 12 November 1975 the prices for United States No. 2 yellow corn were:

Delivery points in Illinois:	US$2.42/bushel
For delivery in Chicago:	US$2.52/bushel
Minneapolis:	US$2.49/bushel
Baltimore:	US$2.65/bushel
Gulf of Mexico ports:	US$2.75/bushel
Chicago futures price for:	
December contract:	US$2.64/bushel
March contract:	US$2.72/bushel
May contract:	US$2.76/bushel
July contract:	US$2.77/bushel
September contract:	US$2.70/bushel

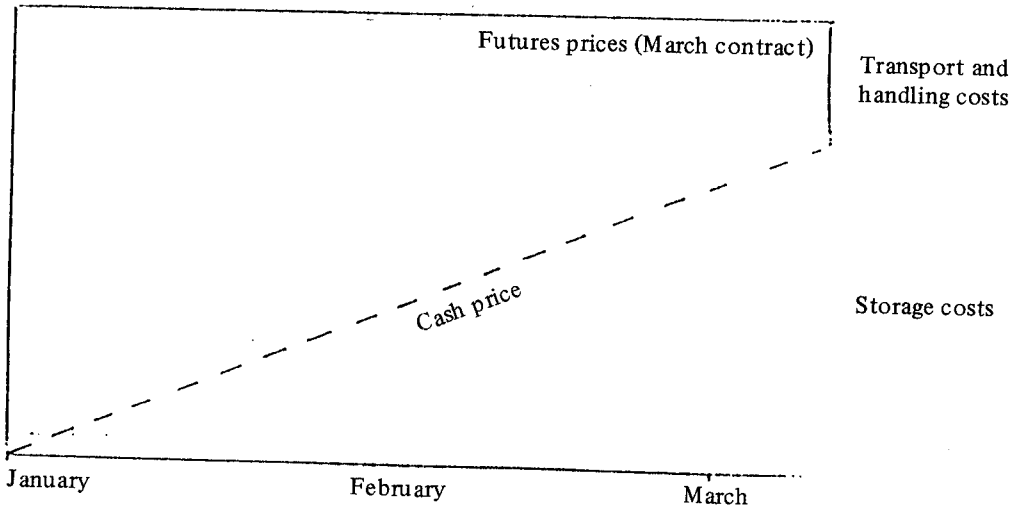
The price structure for different locations and points in time is expressed in terms of premiums (or discounts) on the basis. Thus, for example, Gulf of Mexico corn was selling at a premium over December of US$0.11 per bushel and in Baltimore the premium was US$0.01 per bushel, whereas grain for delivery in Chicago was selling at a discount (negative premium) of US$0.12 under the December contract. The price spreads are accounted for, in theory, by the location (there is a difference between the cash price in Chicago and the cash price in the Gulf due to transport costs) handling charges (loading into the grain elevator, unloading, etc.), the margins of buyers and sellers, taxes, and carrying charges between one delivery date and another (storage costs, including interest and insurance). In theory (CBT, 1988), the "normal" relation between spot and future prices is that shown in the upper portion of figure 1.

However, in addition to the various costs mentioned above, the premium may vary depending on supply and demand at any given moment in each location. Under certain circumstances there may be an oversupply in the Gulf, with the result that premiums fall in relation to those corresponding to Chicago delivery points and vice versa and the premium is therefore subject to fluctuations.

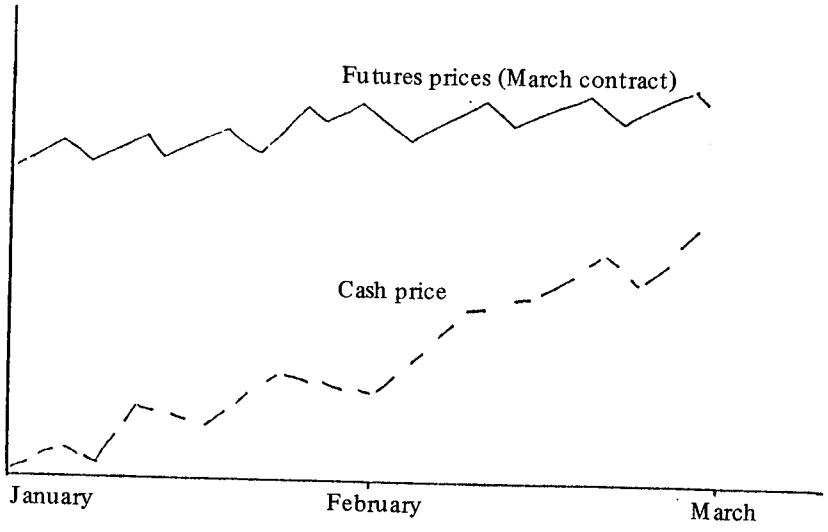
Countries competing with the United States, such as Argentina and Brazil, also use prices expressed in premiums or discounts over or under the United States futures exchanges which are used as reference markets. These premiums are incorporated as such into export contracts or are converted into specific prices in dollars per ton. Thus, world trade operates on the basis of a system of prices for the ports in each country which are expressed in premiums or discounts on futures market quotations. For example, on 10 March 1989 international quotations for oilseed commodities were expressed in terms of the following premiums (in US cents per bushel) over (or discounts under) the Chicago market quotations, which in turn implied the FOB prices (in dollars per ton) shown below:

Figure 1
RELATIONS BETWEEN FUTURES PRICES AND CASH PRICES

Hypothetical situation



Real situation



	Premium			Price		
	Grain	Meal	Oil	Grain	Meal	Oil
Rosario	-3.5	-16.0	-460	272	244	413
Paranaguá	-21.0	-8.0	-480	278	253	408
Gulf of Mexico	+28.0	+5.7	+70	293	268	530

As in the case of the United States, the premiums corresponding to each country reflects differences in transport costs, loading conditions at the ports, the quality of the grain sold, and the existence or absence of supply agreements, as well as local supply and demand. All of these variables, but particularly the last one, result in seasonal and annual fluctuations in the premiums (or price differences between countries). Although in theory international markets are closely interrelated, the diversity of factors that influence market trends in the United States and in Latin American and Caribbean exporting countries is reflected in variations in the price spreads among different countries —changes in the basis— for different years (see tables 12, 13 and 14).

d) Relation between export and domestic prices

In both Argentina and Brazil, some of the grain sales on the domestic spot market (second sale) are conducted in the grain exchanges (Buenos Aires, Rosario, São Paulo, etc.) Argentina's main exchanges have a long history and their futures markets played a very important role in the 1920s and 1930s.[13] However, various circumstances that affected the agricultural economy of the country (the removal of protection for the agricultural sector, price controls, a trade monopoly, exchange controls, etc.), as well as certain limitations of the exchanges themselves, impaired their subsequent development and their significance as trading centres has consequently declined considerably, although, they do still play an important role in disseminating information and providing ancillary services (quality analyses, arbitrage, etc.). Brazil's grain exchanges were founded more recently and are as yet of less importance at the global level. The increase in grain production for export is a recent phenomenon and is taking place in very diverse and widely scattered regions, and all the various instruments and institutions linked with the grain trade are therefore still in the process of being developed. The changes made in domestic price policies during the past decade with a view to fostering a stronger market orientation (and eliminating government interference) have been particularly important for this process.

Table 12

FOB PRICE SPREADS BETWEEN GULF OF MEXICO AND ARGENTINE * PORTS

(Dollars per ton)

Agricultural year	Wheat	Corn	Soybeans
1981/1982	-4	8	16
1982/1983	19	5	14
1983/1984	24	8	21
1984/1985	36	11	20
1985/1986	31	18	14
1986/1987	26	2	3

Source: National Grain Board (JNG).
Note: * During peak sales periods for each grain in Argentina (wheat: December-March; corn: March-June; soybeans: May-July).

Table 13

SPREADS BETWEEN FOB PRICES AT GULF OF MEXICO PORTS AND KANSAS WHEAT AND CHICAGO CORN AND SOYBEAN QUOTATIONS*

(Dollars per ton)

	Wheat	Corn	Soybeans
1981/1982	-20.56	-10.39	-12.27
1982/1983	-24.49	-11.11	-9.42
1983/1984	-17.32	-9.72	-5.38
1984/1985	-18.4	-10.96	-8.86
1985/1986	-15	-13.38	-7.1
1986/1987	-13.89	-9.05	-9.03

Note: * The quotations on which this table is based are as follows: Kansas wheat prices: March contract for the period December-March; Chicago corn prices: May and July contracts for March-July; Chicago soybean prices: July contract for May-July.

Table 14

SPREADS BETWEEN FOB PRICES AT ARGENTINE PORTS AND KANSAS WHEAT AND CHICAGO CORN AND SOYBEAN QUOTATIONS*

(Dollars per ton)

	Wheat	Corn	Soybeans
1981/1982	-24.63	-2.59	3.97
1982/1983	-5.36	-5.82	4.76
1983/1984	7.06	-1.06	15.63
1984/1985	17.45	0.29	11.33
1985/1986	15.95	5.04	7
1986/1987	11.99	-6.9	-5.73

Note: * The quotations on which this table is based are as follows: Kansas wheat prices: March contract for the period December-March; Chicago corn prices: May and July contracts for March-July; Chicago soybean prices: July contract for May-July.

SPREADS BETWEEN FOB SOYBEAN PRICES AT BRAZILIAN PORTS AND FOB SOYBEAN PRICES AT ARGENTINE PORTS AND CHICAGO PRICES

	FOB Brazil* Dls/tn	FOB Buenos Aires* Dls/tn	Chicago* Dls/tn	Spread Dls/tn (1)	(2)	(3)
1983/1984	288	269	283	5	-14	19
1984/1985	207	199	210	-3	-11	8
1985/1986	199	188	195	4	-7	11
1986/1987	211	209	203	8	6	2

* Average Prices, May/July contracts.

(1) Spread FOB Brazil/Chicago.
(2) Spread FOB Buenos Aires/Chicago.
(3) Spread FOB Brazil/FOB Buenos Aires.

In the exchanges of these countries, trading activity primarily concerns either spot or forward sales; the sellers are mainly grain-elevator firms and first-level cooperatives, while only a small fraction of large integrated producers use these markets (see figures 2 and 3). Prices are immediately disseminated to the rest of the country and serve as a basis for other transactions conducted outside the exchanges, either by the same traders or by others.

At least in theory, provided that such markets are not affected by short-run imperfections (which under some circumstances may give rise to extraordinary profits or losses), during the peak period for grain exports (i.e., the months immediately following the harvest) prices on the exchanges reflect the purchasing power of exports; this can be represented, in a simplified form, as follows.[14]

Domestic price = 1 (FOB price - export costs) x net exchange rate and

Net exchange rate = Commercial exchange rate - export taxes + export drawback

Thus, in Latin American and Caribbean exporting countries, the domestic prices of exportable goods, expressed in constant local currency, not only depend on the trend of export prices but are also influenced by variations in net exchange rates. If the net exchange rate outdistances or lags behind price trends in the rest of the economy, the relation between export prices (which are expressed in United States dollars per ton) and domestic prices (in constant local currency per ton) will be altered. In figure 4 and tables 15 and 16, fluctuations in the net exchange rate for corn and wheat in Argentina are shown. These sharp swings heavily skew the relationship between international and local prices, as can be seen in table 17.

2. Participation of the various agents in trading of grain and related products on the Chicago and Kansas exchanges

a) Users and forms and levels of participation in the futures markets

As indicated in the first part of this study, the purchase and sale of grain in the United States for both the domestic and export markets is carried out by private traders who rely heavily on futures markets: i) as a source of price information; ii) as a point of reference for business transactions (prices are calculated in premiums or basis points on futures positions expressed in cents per bushel or dollars per ton), and iii) for hedging. Operating hedges are especially important for exporters because these hedges make it possible to reduce significantly the risk associated with

Figure 2

ORGANIZATION OF GRAIN TRADE IN ARGENTINA

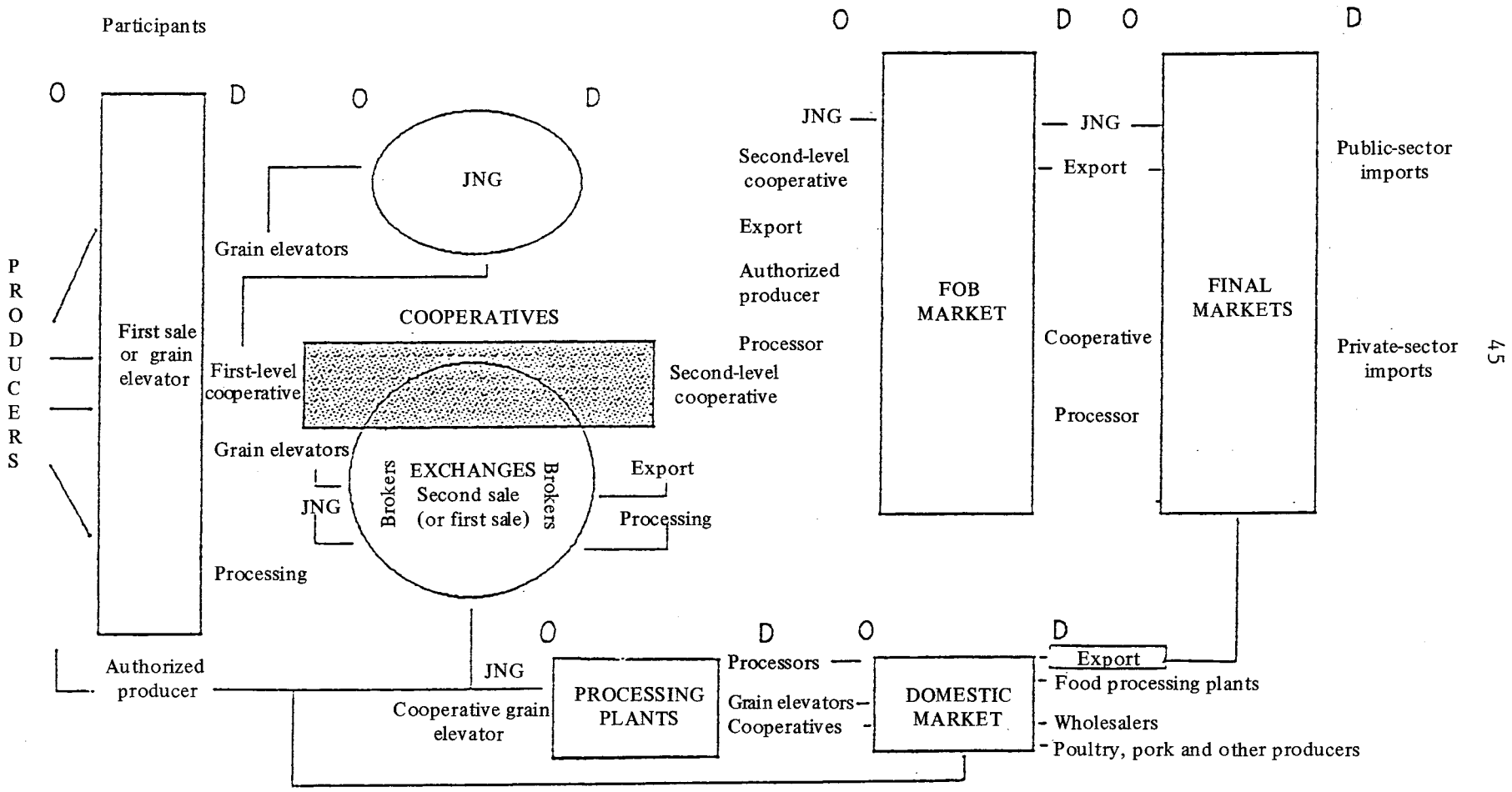


Figure 3

GRAIN MARKETING CHANNELS: SHARES OF THE DIFFERENT TYPES OF AGENTS

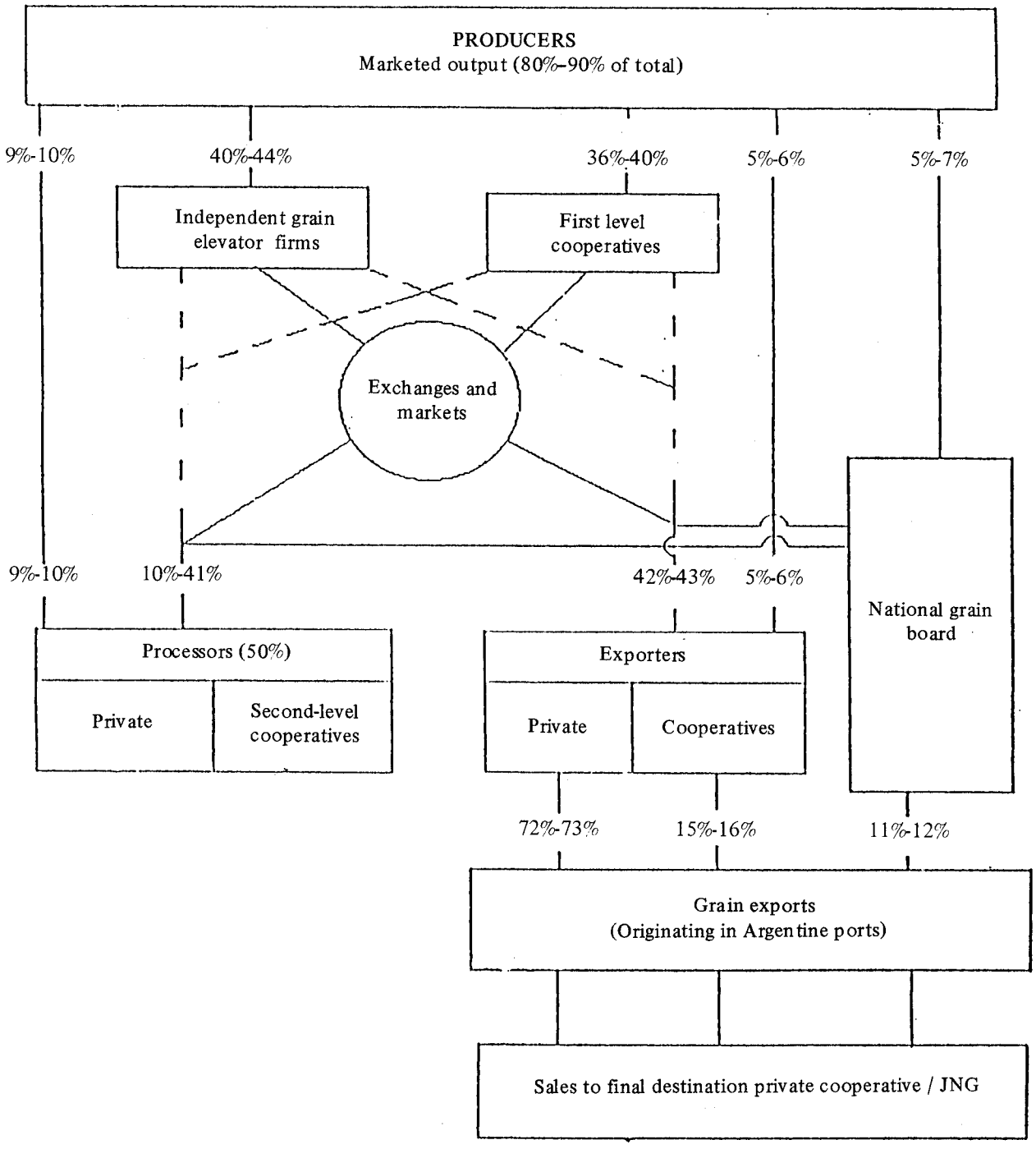
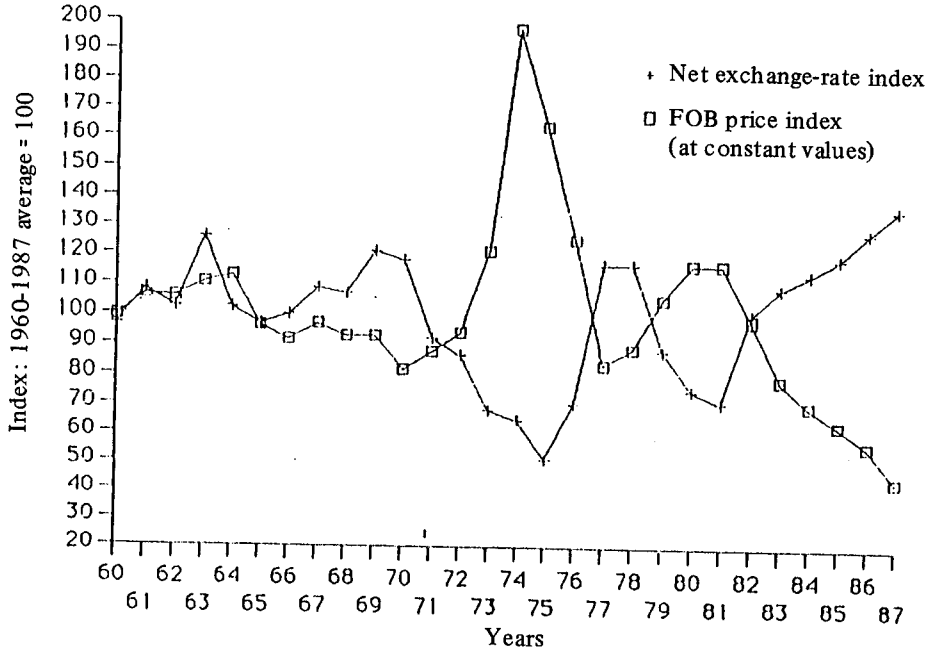
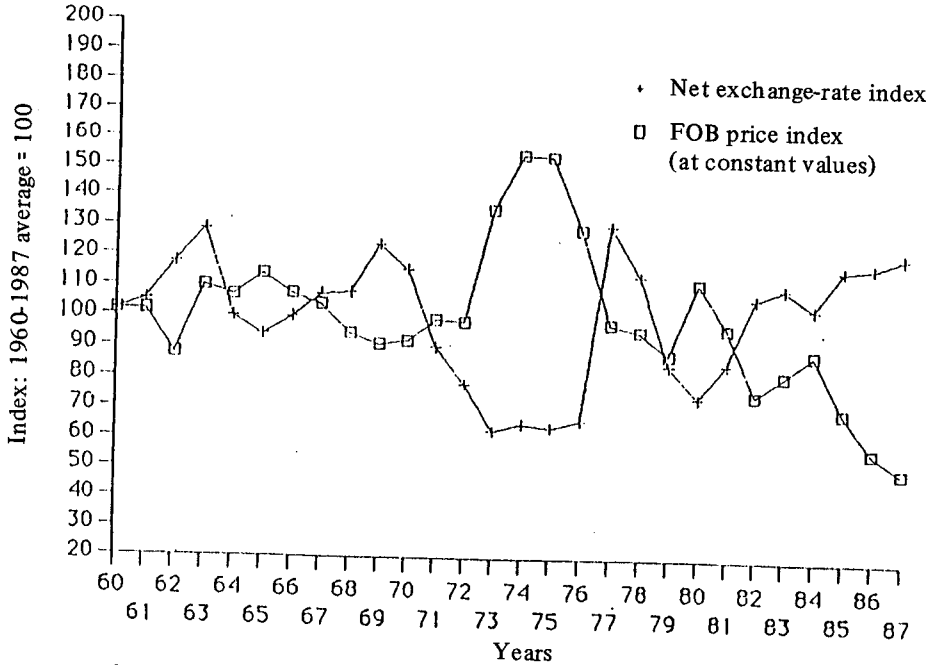


Figure 4

WHEAT: NET EXCHANGE RATE AND FOB PRICE TRENDS



CORN: NET EXCHANGE RATE AND FOB PRICE TRENDS



Source: Marcelo Regúnaga, ***La competitividad de la producción de granos argentinos en el mercado internacional. Evolución y perspectivas,*** Inter-American Institute for Cooperation on Agriculture (IICA), 1988.

Table 15

ARGENTINA: NET EXCHANGE RATE INDEX FOR WHEAT

(Base: Average 1960/1988 = 100)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Average
1960	96.9	97.4	98.2	98.7	99.2	99.2	97.4	96.6	96.4	97.2	104.7	110.9	99.3
1961	102.9	103.2	103.7	104.9	103.1	100.6	98.6	95.6	94.6	94.9	92.9	103.4	101.0
1962	102.9	102.1	102.5	110.3	112.5	120.3	118.3	116.3	116.3	122.3	133.6	123.4	115.1
1963	129.4	128.1	126.7	127.2	126.0	124.2	121.4	119.1	122.7	123.1	115.8	106.7	122.5
1964	102.0	100.7	100.9	99.4	96.4	95.8	95.9	97.1	95.3	93.8	98.6	100.7	98.0
1965	98.3	95.1	93.8	99.8	89.8	86.3	95.0	93.2	96.5	96.2	95.9	101.0	95.0
1966	100.7	100.6	100.9	99.1	97.2	96.1	96.1	99.0	99.8	96.4	111.2	110.0	100.6
1967	109.2	110.0	109.2	107.8	104.9	102.0	99.8	97.2	96.2	94.1	103.8	106.2	103.4
1968	104.9	103.8	106.7	107.0	103.0	105.1	105.1	103.9	103.7	104.0	122.1	121.5	107.9
1969	122.0	122.5	123.6	123.5	120.2	118.7	117.8	115.5	114.3	116.7	117.5	118.7	119.2
1970	118.8	118.3	118.1	115.9	111.7	111.3	110.7	106.4	103.6	99.5	97.7	96.0	109.0
1971	92.1	91.0	92.8	89.3	86.1	86.8	87.5	82.9	84.0	86.2	94.9	94.3	89.3
1972	83.1	82.3	80.7	78.1	77.1	73.1	71.8	72.1	70.7	68.3	67.5	70.3	74.8
1973	69.7	66.4	63.7	61.8	59.7	62.1	61.5	64.3	62.9	62.5	64.3	65.0	63.7
1974	65.1	66.2	66.8	65.7	63.9	62.0	62.7	63.1	60.9	59.8	57.9	56.2	62.5
1975	52.9	46.9	43.6	56.2	59.4	69.5	59.0	61.6	59.1	57.9	57.9	64.9	57.4
1976	72.6	74.5	54.8	65.2	63.9	65.5	64.4	75.7	125.3	120.5	113.3	128.6	85.4
1977	120.5	121.2	126.8	128.6	128.3	124.7	124.9	117.1	117.2	112.9	114.1	118.9	121.3
1978	116.8	119.6	117.1	115.0	110.4	107.8	105.1	99.2	97.4	93.6	91.2	90.8	105.4
1979	89.1	87.7	86.3	86.0	83.2	79.1	77.8	70.9	71.0	73.7	74.1	75.2	79.5
1980	75.8	76.3	75.8	74.8	72.9	69.6	69.4	69.7	68.9	70.0	69.0	69.6	71.8
1981	69.9	75.5	75.7	79.4	77.8	90.0	83.5	95.8	97.5	99.3	96.2	99.8	86.7
1982	104.9	100.4	106.3	106.2	107.4	100.8	95.6	94.0	86.3	99.7	111.3	113.1	102.2
1983	110.0	108.4	109.2	114.1	112.9	108.6	108.3	103.9	95.7	97.7	102.3	108.9	106.7
1984	120.2	116.2	109.6	103.8	100.4	100.4	102.8	101.7	99.2	106.8	111.4	115.3	107.3
1985	136.5	124.0	122.5	120.8	122.2	111.1	117.7	115.5	114.3	127.5	132.1	131.2	123.0
1986	130.6	127.8	124.2	123.6	124.1	121.9	119.4	116.3	118.7	117.8	118.2	111.9	121.2
1987	138.1	139.1	143.6	141.9	140.0	141.0	143.0	139.5	139.3	140.5	145.7	150.1	141.8
1988	148.6	145.6	143.1	143.1	137.3	133.2	128.0	121.3	114.5	111.5	111.7	109.9	129.0
1989	107.7	122.3	126.1	-	-	-	-	-	-	-	-	-	135.8

Source: National Grain Board and the National Institute of Statistics and Census of Argentina.
Note: Net exchange rate deflated by the General Wholesale Price Index of Argentina. Indexes calculated on the basis of the series average.

Table 16

ARGENTINA: NET EXCHANGE RATE INDEX FOR CORN

(Base: Average 1960/1988 = 100)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Average
1960	98.9	99.3	100.2	100.7	101.1	101.1	99.5	98.6	99.3	112.3	112.5	112.2	102.9
1961	112.1	110.4	119.7	119.0	116.9	114.0	111.6	108.2	107.3	107.5	105.3	105.8	111.5
1962	105.0	119.2	119.6	127.6	130.1	139.0	136.7	135.0	134.5	151.1	154.6	142.7	132.9
1963	133.7	132.6	131.0	131.5	130.3	128.3	125.5	123.2	126.8	127.3	119.8	110.2	126.7
1964	105.5	104.1	104.3	102.7	99.7	99.1	99.0	100.5	98.5	97.1	102.0	104.2	101.4
1965	101.6	98.3	97.0	103.2	99.1	96.5	91.6	89.8	93.0	92.9	92.5	97.4	96.1
1966	97.2	97.0	97.2	95.5	93.7	94.0	94.0	90.1	90.7	87.7	95.9	94.8	94.0
1967	94.1	99.2	118.0	112.0	109.0	106.0	103.7	100.9	100.0	97.8	98.0	100.3	103.2
1968	99.0	107.0	110.7	111.0	109.0	109.0	109.0	107.8	107.5	118.1	123.6	122.9	111.2
1969	123.5	124.0	125.0	125.0	121.6	120.1	119.2	116.9	115.7	118.0	118.9	120.1	120.7
1970	120.2	120.3	119.5	117.2	112.8	112.5	111.8	107.5	104.7	100.5	98.7	97.0	110.2
1971	93.0	92.0	93.8	90.7	89.0	87.7	88.5	84.9	85.0	87.9	87.2	90.3	89.2
1972	87.2	84.3	82.5	82.4	86.8	82.2	80.6	81.1	79.5	76.9	75.9	74.8	81.2
1973	72.2	68.9	66.1	75.5	76.2	62.7	53.8	56.3	52.0	51.7	53.2	58.5	62.3
1974	64.2	65.3	65.9	64.8	63.0	61.2	81.5	88.8	85.7	73.1	65.6	63.6	70.2
1975	59.9	53.1	59.5	68.2	65.1	72.5	60.1	62.8	60.3	59.0	59.1	69.0	61.6
1976	78.4	77.4	87.3	68.0	75.7	83.5	80.2	78.6	74.5	72.0	70.8	117.5	77.8
1977	109.8	110.5	115.6	117.3	117.0	113.6	113.8	106.7	106.8	102.9	104.0	108.3	110.5
1978	106.4	108.9	119.5	117.3	112.7	110.0	107.2	101.2	99.3	95.3	93.0	92.6	105.3
1979	90.9	89.5	88.0	87.8	84.9	80.7	79.3	72.4	72.4	75.2	75.6	76.8	81.1
1980	77.3	77.5	77.4	76.3	74.3	71.0	70.8	71.1	70.2	71.4	70.4	71.0	73.2
1981	71.3	77.1	77.2	81.0	79.4	92.5	88.7	97.7	99.5	101.3	98.2	101.8	88.8
1982	107.0	102.4	108.4	108.4	109.5	102.9	97.5	95.9	88.0	101.7	113.6	115.4	104.2
1983	112.3	110.6	111.4	116.4	115.2	110.9	110.4	106.0	97.7	99.7	104.3	106.6	108.5
1984	112.1	108.3	102.2	96.9	93.5	93.5	95.7	94.7	92.3	99.4	102.9	100.4	99.3
1985	103.7	106.0	104.9	103.1	104.4	95.0	100.7	113.5	112.4	112.3	112.0	111.2	106.6
1986	110.7	111.5	117.6	117.1	117.6	115.4	113.0	110.0	112.3	111.4	111.8	114.1	113.5
1987	116.6	117.4	121.2	129.2	127.5	128.3	130.2	127.0	126.9	127.9	132.7	129.6	126.2
1988	128.4	148.5	146.0	146.0	140.1	135.9	130.6	123.8	116.8	113.8	113.9	112.1	129.7
1989	109.8	124.8	128.7	.									138.5

Source: National Grain Board and the National Institute of Statistics and Census of Argentina.
Note: Net exchange rate deflated by the General Wholesale Price Index of Argentina. Indexes calculated on the basis of the series average.

Table 17

INDEXES OF INTERNATIONAL AND ARGENTINE DOMESTIC GRAIN PRICES

(Base: 1975-1989 = 100)

Year	Wheat (December/February)		Corn (March/June)		Soybeans (May/July)	
	International	Domestic	International	Domestic	International	Domestic
1975	196.7	117.0	163.2	99.8	0.0	96.6
1976	138.5	107.4	145.9	89.3	0.0	174.7
1977	89.6	119.1	112.9	140.5	168.8	186.5
1978	105.7	120.7	114.5	137.0	131.3	125.2
1979	103.0	98.8	99.7	90.9	125.1	98.5
1980	129.1	106.3	126.9	97.8	92.5	64.4
1981	133.8	98.5	101.4	80.1	94.9	74.7
1982	107.0	115.2	82.4	93.8	85.0	95.8
1983	88.3	107.1	93.1	112.2	82.6	93.9
1984	75.6	93.3	98.9	109.3	95.8	87.9
1985	65.6	78.0	78.3	95.4	72.7	72.9
1986	62.9	81.4	63.4	78.3	69.3	71.1
1987	50.2	66.6	56.0	79.8	76.0	102.0
1988	56.2	91.1	63.4	95.6	106.1	127.0
May 88	63.6	114.2	54.4	79.8	90.4	107.9
June 88	70.8	130.4	81.6	127.3	116.4	144.3
July 88	79.0	133.0	91.5	126.2	111.9	128.8
Aug. 88	81.4	125.5	82.4	105.2	109.8	121.6
Sep. 88	85.6	109.5	83.2	104.3	109.8	113.3
Oct. 88	84.0	99.8	83.2	97.1	100.3	108.2
Nov. 88	84.8	104.9	79.1	90.8	96.2	103.1
Dec. 88	85.8	104.0	79.9	94.0	97.0	102.4
Jan. 89	89.7	93.9	84.9	111.5	95.8	103.9
Feb. 89	88.2	100.1	79.9	114.0	91.6	104.7
Mar. 89	85.2	111.8	81.6	135.6	92.5	126.5

Source: National Grain Board (JNG) of Argentina.
Note: Domestic prices deflated by the Total Non-Agricultural Wolesale Price Index; international prices deflated by the United States Wholesale Price Index.

seasonal price variations when they are arranging large-scale external sales without having the grain on hand. The use of anticipatory hedging is less widespread among exporters in the United States. This type of hedge involves the sale of futures contracts prior to physical sales of grain and related products so that the trader may select the most advantageous moments to make the actual sales. Exporters also use arbitrage (although to a lesser degree than grain-elevator firms) in order to reduce the risk associated with holding stocks during certain times of the year.[15]

Most exports of grain and related products from Argentina and Brazil are also handled by private firms. All Brazilian exports of oilseed products and some exports of other grains (e.g., corn) are conducted through private exporters. In Argentina a semi-public system is used in which a portion of grain exports (10% to 15%) is channelled through the National Grain Board [16] (government-to-government sales) and the rest is exported by private firms (see table 18). In both countries export firms of varying sizes and levels of integration and conglomeration participate in this activity, but a large proportion of such exports are made by firms engaging in offshore operations. The detailed monitoring of activities conducted outside the territories of these two countries is quite difficult, since some firms are subsidiaries of multinationals while others have branches or agencies abroad (their identities are fairly well known in some cases and less so in others),[17] which, in addition to providing them with better access to foreign markets, facilitates their management of foreign exchange, international credit and futures markets.

These circumstances make it much more difficult to arrive at accurate assessments of the extent to which private Brazilian and Argentine traders participate in United States futures markets. Various studies which attempt to ascertain the level of participation of foreign traders as a whole (Powers and Tosini, 1985; Thompson and Bond, 1985) (see table 19) suffer from serious limitations which are virtually impossible to overcome by means of secondary methods (such as those utilized in these calculations). Two of the main problems in this regard are: i) some operations are not reported in the information provided by the CFTC (which covers only those futures positions that exceed a certain size), and ii) many operations that are recorded as having been conducted by United States firms (e.g., Cargill, Continental, etc.) may correspond to transactions that originated in Latin American subsidiaries.

Table 18

ARGENTINA: DISTRIBUTION OF GRAIN EXPORTS, BY FIRM

(Thousands of tons)

Firm	1983	1984	1985	1986	1987
1. Cooperatives					
A.C.A.	2 028	1 726	1 961	1 478	823
A.F.A	315	317	404	457	183
F.A.C.A.	2 149	2 157	2 261	1 373	1 061
2. Private					
BUNGE & BORNE	1 474	893	927	1 008	329
NIDERA	2 228	2 543	2 521	1 318	1 310
CARGILL	2 326	1 820	2 638	968	726
EMILIANA (Ferruzzi)	721	771	1 121	1 069	353
CONTINENTAL	1 162	1 812	1 488	1 047	490
ITALGRANI	707	243	346	310	226
LA PLATA CEREAL (André)	1 697	704	888	639	460
DREYFUS	1 244	1 150	1 632	912	532
PRODUCTOS SUDAMERICANOS	876	851	995	836	309
TRADIGRAIN	1 228	904	917	794	480
GENARO GARCIA	1 286	654	635	543	260
Other	1 849	2 178	2 822	3 066	4 624
3. National Grain Board (JNG)	2 466	1 917	2 167	834	1 752
Total	23 726	20 640	23 723	16 652	15 388

Note: Shipments registered at point of origin with the National Grain Board. Some firms and the National Grain Board sell larger volumes at delivery points.
Source: National Grain Board of Argentina.

Table 19

PERCENTAGE OF OPEN INTEREST IN GRAIN AND OILSEED FUTURES, AS OF END OF REPORTING MONTH, ACCOUNTED FOR BY FOREIGN TRADERS IN UNITED STATES EXCHANGES

Period	Long	Short
June 1976-February 1977	3.7	3.5
January 1978-February 1980	1.4	0.8
May 1983	26.6	22.4

Source: Stanley Thompson and Gary Bond, "Basis and exchange rate risk in offshore futures trading", American Journal of Agricultural Economies, vol. 67, No. 5, 1985.

Notes: * Wheat, corn, oats, rice, soybeans, soybean oil and soybean meal.
** Data compiled on the basis of information available in the CFTC on open contracts for minimum volumes which must be reported (traders of 52 foreign countries).

In order to overcome these limiations a field research project should be conducted to survey the activities of export firms in both countries. Such a study is outside the scope of the present report, but direct consultations with the major export firms in Argentina and Brazil indicate that a large proportion of such exports are hedged on United States futures markets. Most of these hedges are made in the grain exchanges, but cross-hedges involving other commodities and financial and currency futures are also used.

There are two possible channels for hedging in futures markets: i) direct communication by local firms or parent companies with brokers or commission houses in Chicago and Kansas; and ii) communication through the representatives of such commission houses in Argentina and Brazil. Several fairly large commission houses which trade on the Chicago exchange maintain offices in these countries that act as a liaison and provide consulting services to local firms. Thus, the necessary infrastructure for a widespread use of grain futures markets does exist. In Argentina, small local export firms (shipping less than 100 000 tons per year) have taken advantage of this infrastructure to gain access to United States futures markets. The foregoing facts support the conclusion that private firms in Argentina and Brazil have already developed the necessary mechanisms for a broad-based utilization of the futures markets of the United States for grain and related products.

A different type of situation exists with respect to public institutions specializing in grain exports (in particular the National Grain Board of Argentina (JNG)) and similar agencies in other Latin American countries that export grain in small quantities. Such agencies use futures markets in the United States as sources of information and/or —in some instances— as a basis for drawing up contracts (using prices expressed in premiums above or discounts below Chicago quotations), as has been the case with sales made by the National Grain Board to CONASUPO of Mexico. However, unlike CONASUPO, which has used the Chicago market to hedge its purchases, the JNG has not hedged in the futures markets but has instead assumed all the price risk itself, which is very great, considering the volumes involved. In fact, the sales made by the JNG to other countries usually involve very large volumes per contract (on some occasions individual transactions for more than 500 000 tons have been conducted [18] which it has not purchased beforehand on the domestic market. The lack of immediate hedging cover can lead to very large losses when the market is moving upward, and government sales themselves may push prices up when exportable surpluses are limited.

III. BENEFITS DERIVED AT THE FIRM LEVEL, FROM THE USE OF FUTURES MARKETS

1. Analysis of different types of operations: examples of uses made of local and United States exchanges

The prices of grain and related products are characterized by variations over time, both within the trading cycle and from year to year (see figures 5 and 6). Such variations have been very sharp during the last two decades as a result of frequent imbalances between world supply and demand. In fact, since the beginning of the 1960s, world trade in these commodities has been marked by a high degree of price volatility and unpredictability due to changes in climatic conditions, fluctuations in the prices of other products and assets, direct and indirect government intervention (production and trade subsidies, devaluations, credits, supply controls, management of stocks, etc.), inflation in the different countries concerned, changes in per capita consumption levels, etc. Temporal price variations have affected not only international transactions but also the local markets of the United States and the Latin American and Caribbean countries, thereby generating price risk for all participants in the grain marketing system: producers, grain-elevator firms within the various countries, exporters, grain processors (flour mills, edible oil producers, weighers, etc.) and food processors.

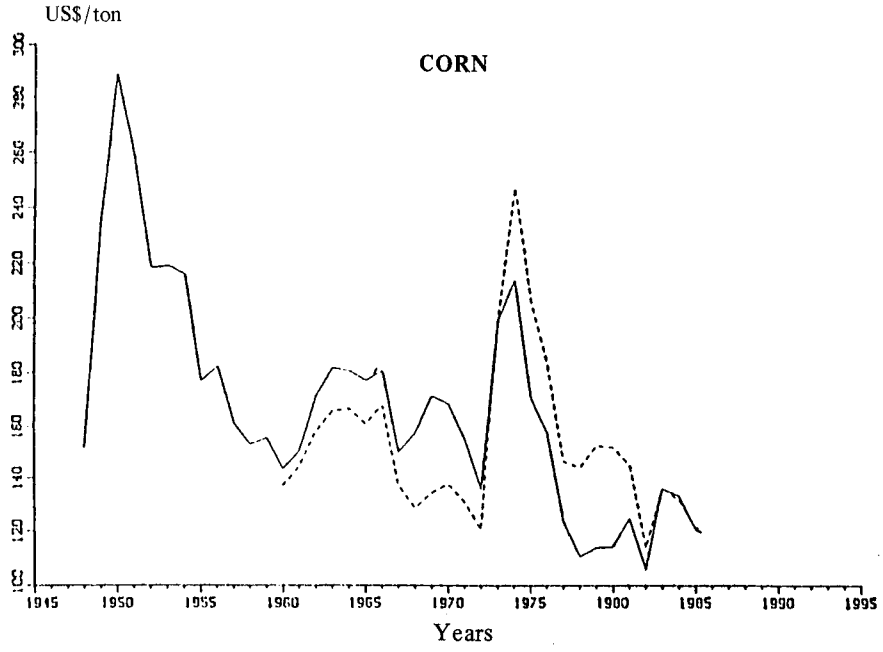
Local and international futures markets provide opportunities for firms operating in the grain trade to improve their performance through the use of such exchanges for determining and selecting purchase and sale prices, hedging, reducing their working capital requirements, facilitating access to financing, etc. These advantages can help firms to concentrate their efforts on their primary objectives (producing, trading, processing) and thereby maximize their profits.

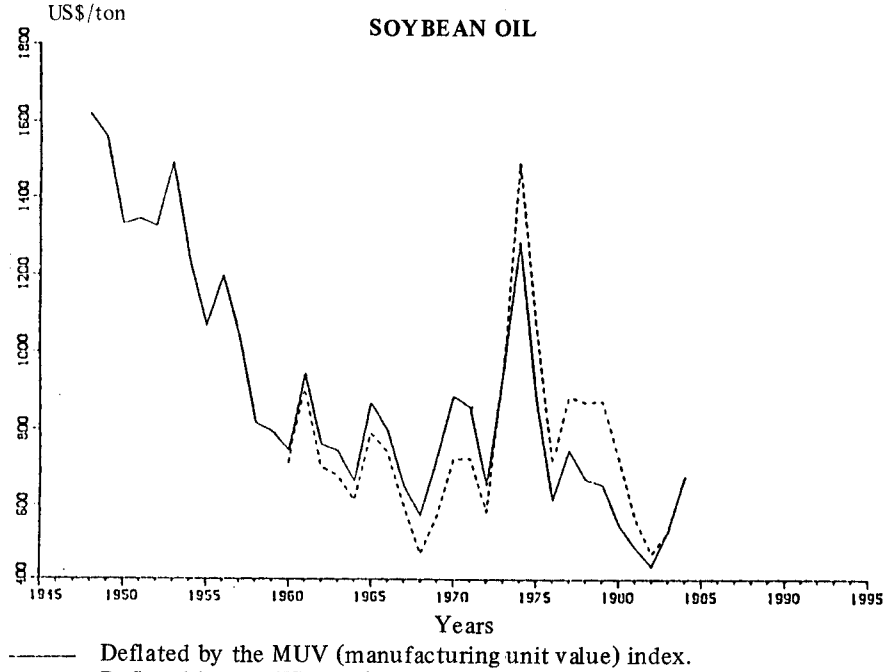
a) Grain prices in futures and spot markets: the basis

Market participants have a broad range of alternatives to choose from as regards the purchase and sale of grain: transactions in the spot market, anticipatory hedging and sales in futures markets, purchases and sales of options, arbitrage, etc. Correct

Figure 5

ANNUAL COMMODITY PRICE VARIATIONS





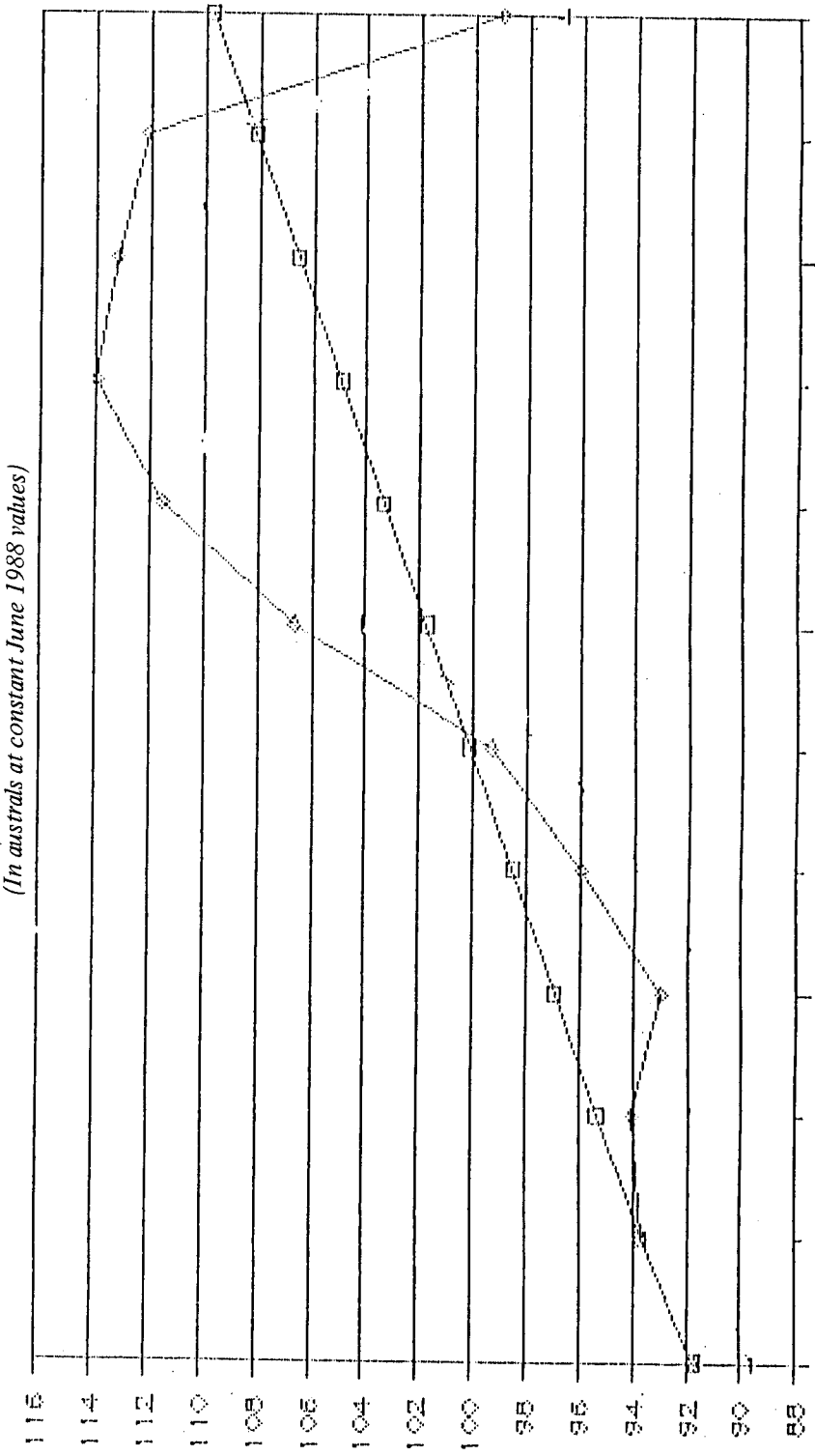
——— Deflated by the MUV (manufacturing unit value) index.
------ Deflated by the USGDP (gross domestic product) deflator.

Source: World Bank.

Figure 6

SEASONAL VARIATIONS IN WHEAT PRICES AND CARRYING CHARGES IN ARGENTINA'S DOMESTIC MARKET (AVERAGE 1980-1988)

(In australs at constant June 1988 values)



Source: On the basis of data compiled by the National Grain Board (JNG) of Argentina and by the National Institute of Statistics and Censuses (INDEC) of Argentina.

Note: Prices deflated by the Wholesale Price Index. Carrying charges include interest and storage costs.

use of these alternatives can help to improve their business performance, since inter-market price relations provide a guide fordeciding when and where to buy or sell, when or under which circumstances it is advisable to hedge or buy options, etc.

One clearly fundamental price relationship is the "basis", which measures the spread between a specified spot price (cash price) and a futures price. The cash price corresponds to a specific quality of the commodity in question, which may or may not coincide with the grades specified in futures contracts (which are for standaridized product grades and pre-established delivery points). Thus, different premiums may be determined for grain located in the United States, for grain FOB in Argentine, Brazilian or other Latin American ports, for grain FAS in these countries, etc., so long as the grain in question is of a grade similar or comparable to that specified in futures contracts.

Grain futures exchanges offer participants in the spot market (producers, grain-elevator firms, processors, exporters, etc.) the infrastructure needed to establish competitive prices for deliveries planned for the future. Futures prices are immediately disseminated in the United States and throughout the rest of the world and thus serve as indicators for other grain transactions at the national and international levels. Many authors contend that price formation in futures markets is more reliable —provided that the markets are highly competitive and transparent, that participants have ready access to all markets and that strict institutional regulations are in effect— than price formation in spot markets.

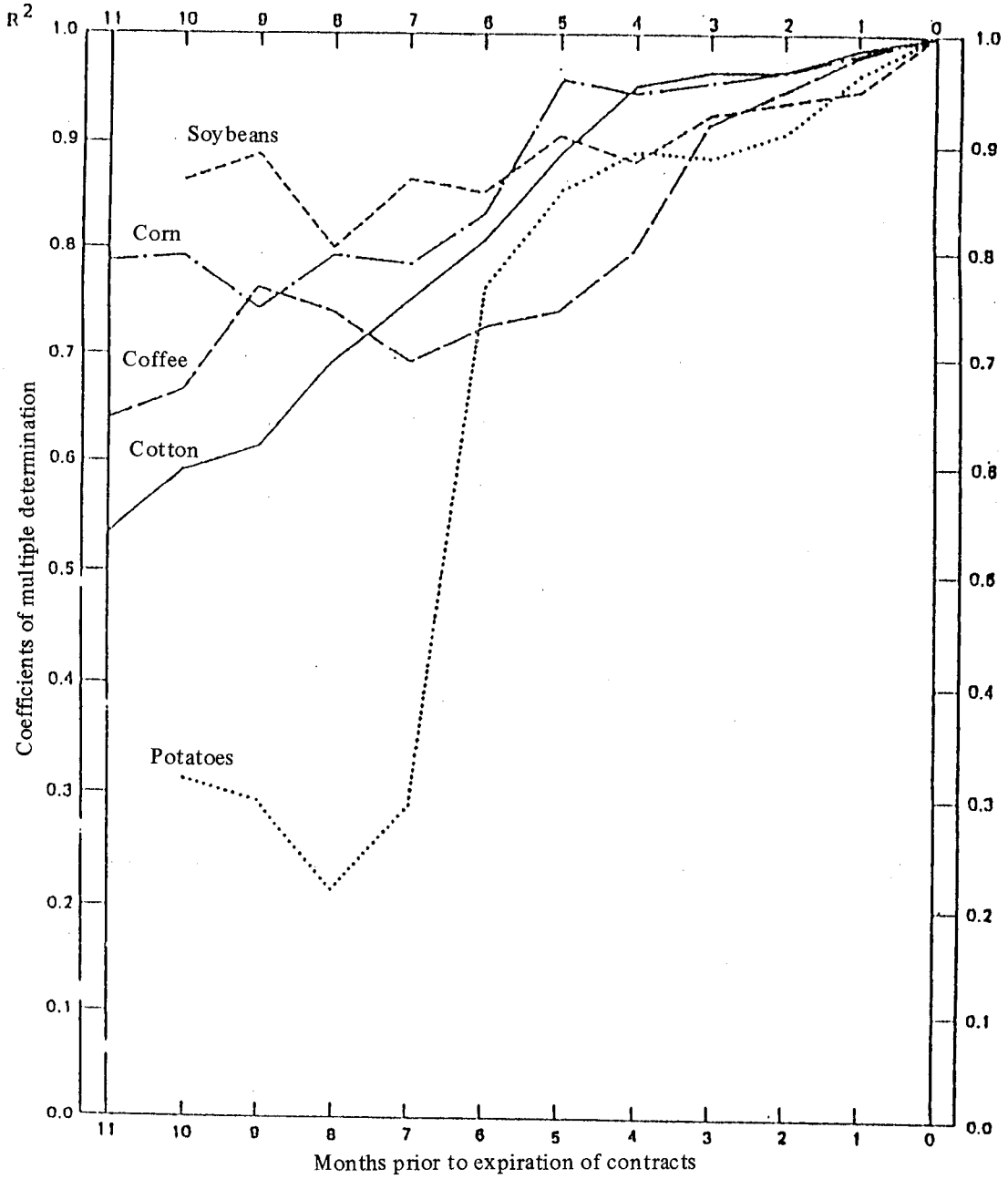
There is a close correlation between cash prices and the futures quotations for the closest delivery month. In fact, as can be seen in figure 7 and table 20, the coefficients of correlation (R^2) for grain futures and spot grain prices are even higher than they are for other commodities traded on the exchanges. Thus the prices quoted for United States grain futures are very reliable predictors of spot prices.

Just and Rausser (1981) compared the accuracy of futures markets and econometric models as predictors of cash prices in the United States and found that for some commodities (soybean meal and soybean oil) futures were better indicators while for others (wheat, soybeans) the two were similar.

As is also the practice in the domestic market of the United States, this country's futures market quotations are used as a point of reference for most international transactions. The importance of the United States in world trade and the close interrelationship among grain markets throughout the world thus contribute to the operation of a pricing system in which Chicago and Kansas quotations are the common denominator.

Figure 7

CORRELATION BETWEEN SPOT PRICES AND PRICES OF CLOSEST FUTURES CONTRACTS



Source: James Fry and Tetteh Kofi, ***Commodity Exchanges and their Impact on the Trade of Developing Countries,*** UNCTAD, May 1983.

Table 20

CORRELATIONS BETWEEN QUOTATIONS IN FUTURES AND SPOT GRAIN MARKETS

(United States)

	Ratio between Chicago and DECATUR prices						
	1983	1984	1985	1986	1987	Jan. 83 Sep. 86	Oct. 86 June 88
Soybean meal							
1. Coefficient of correlation							
- Spot-futures levels	0.99	0.89	0.65	0.98	0.99	0.97	0.99
- First differences, spot-futures	0.90	0.64	0.72	0.88	0.95	0.85	0.93
2. Percentage reduction hedging	86.9	49.7	24.5	75.1	83.8	77.5	86.5
Soybean oil							
1. Coefficient of correlation							
- Spot-futures levels	0.97	0.95	0.99	0.93	0.99	0.99	0.99
- First differences, spot-futures	0.94	0.81	0.97	0.96	0.96	0.91	0.96
2. Percentage reduction hedging	75.4	68.3	86.7	47.9	91.0	82.5	91.7

Source: Data compiled by the CBT, 1988 (personal source).

(Argentina)

	Wheat Kansas-FOB	Corn Buenos Aires-Chicago	Soybeans Chicago-FOB Buenos Aires
Coefficients of correlation R^2			
1970-1979	0.97	0.88	N/A
1980-1988	0.81	0.76	0.91

Source: On the basis of data provided by the National Grain Board.
Note: Closest futures contracts and FOB prices.

Table 20-A

RANKING OF PRICE FORECASTING BASED ON VARIOUS ECONOMETRIC MODELS AND UNITED STATES FUTURES MARKETS, DECEMBER 1976 TO DECEMBER 1978

	Futures markets	Econometric models				
		CHASE	DOANES	DRI	WHARTON	USDA
Wheat	1	4.5	2	3	6	1	4.5
	2	2	1	4	6	3	5
	3	1	2	3	6	4	5
	4	2	1	3	5	4	N/A
Corn	1	3	4	5	2	1	6
	2	4	3	5	2	1	6
	3	6	4.5	4.5	3	2	1
	4	1	5	3	2	4	N/A
Soybeans	1	1	5	2	3	4	6
	2	3	4	2	5	6	6
	3	2	4	5	3	6	1
	4	1	4	2	3	5	N/A
Soybean oil	1	1	2	N/A	5	3	4
	2	1	5	N/A	4	3	2
	3	2	5	N/A	4	1	3
	4	2	4	N/A	3	1	N/A
Soybean meal	1	3	1	N/A	4	5	2
	2	3	1	N/A	4	5	2
	3	3	4	N/A	2	5	1
	4	1	4	N/A	2	3	0

Source: R. Just and G. Rausser, Commodity Price Forecasting with Large-Scale Econometric Models and the Futures Markets, American Agricultural Economic Association, 1981.

By the same token, prices in United States futures markets react almost instantaneously to changes in world supply and demand (defined in a broad sense so as to incorporate endogenous factors —fundamentals— and the exogenous factors which influence these variables). Consequently, these market quotations synthesize the information available at any given point in time concerning the grain market and the factors that influence it at the world level.

Futures prices differ for the different delivery months mainly because of the carrying charges entailed in holding grain stocks from one month to another. These charges include storage fees, the interest cost of tied-up capital, insurance, other expenses involved in preserving the merchandise in good condition, and inventory shrinkage. Hence, futures prices usually increase incrementally during the course of the trading cycle (see figure 8).

According to the theory of inventory pricing put forward by H. Working (Working, 1949), the difference between two simultaneously determined prices for different delivery months for any storable product (sometimes called the market price of storage) is directly related to the stocks of that product. If grain is in abundant supply, the market price of storage should be close to total costs. Consequently, arbitrage hedgers can be assured that the stocks they hold will generate returns that will cover such costs and will therefore be motivated to store surplus supply. On the other hand if supply is insufficient, the market price of storage will not cover total storage costs and in fact will frequently be negative. Under these circumstances, arbitrage hedgers will not be able to cover their total costs and will thus be discouraged from holding stocks. The strength of this disincentive will depend on the quantities of spot grain available in relation to demand. Consequently, futures prices for different delivery months are not determined independently and should therefore be regarded as being linked (Peck, 1982).

Table 21 shows the going prices for different grains and contracts on a given day in the Chicago market and the market prices of storage from one delivery month to the next (implicit in the preceding ones).

In some cases, these prices cover, at least partially, the carrying charges (as in the case of September and December corn contracts). However, this does not always occur, and under certain circumstances the market prices of storage are even negative (as in the case of August and September soybean contracts), thereby giving rise to inverted markets. Inverted markets (caused by very strong demand or insufficient supply of spot grain, or by expectations of an increase in future supply when the harvest comes in) encourage grain owners to sell on the spot market. Negative returns for storage are either a seasonal phenomenon or occur temporarily during years when there is a supply shortage, and their magnitude

Figure 8

RELATION BETWEEN SPOT GRAIN PRICES AND FUTURES PRICES IN NORMAL AND INVERTED MARKETS

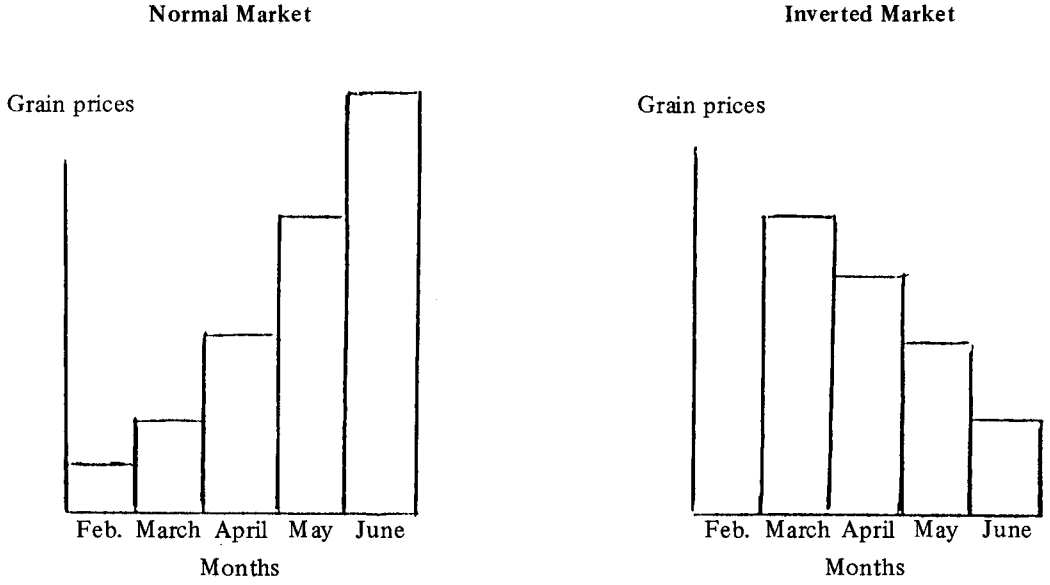


Table 21

CORN AND SOYBEAN FUTURES PRICES AND MARKET PRICES OF STORAGE AS OF 9 JULY 1987 IN THE CHICAGO MARKET

Delivery months	Corn		Soybeans	
	Grain prices	Storage prices	Grain prices	Storage prices
July	65.35		200.62	
August	-		197.68	-2.94
September	67.71	+1.18	195.85	-1.83
November			196.95	+0.55
December	70.67	+0.99	-	

Source: On the basis of data compiled by the National Grain Board regarding quotations in the Chicago market.

Note: Storage prices were calculated by subtracting the quotation for the preceding contract and dividing the result by the number of intervening months.

cannot be predicted, in contrast to the situation in normal markets, where carrying charges hold spreads within certain limits. Using such information, various authors (Working, 1977; Gray and Peck, 1981), have calculated supply curves for storage by relating price differences between futures contracts and stocks (see figures 9 and 10). As these figures indicate, the price of storage theory demonstrates that strategies involving the purchase of futures will not be more costly than the alternative of buying the grain and storing it (given the ceiling fixed by the market) and in many cases may be less costly, depending on the level of carrying charges or of inverted carrying charges in the market during the period covered by the hedge.

Spot grain prices in a given market (e.g., Buenos Aires FOB, Paranaguá FOB, Gulf of Mexico FOB, Rosario FAS, etc.) differ from spot prices at United States futures market delivery points because they correspond to different locations (see figure 11) and delivery conditions, even though the qualities may be similar. The differences in transport costs, in the services and margins involved in FAS or FOB sales, and the supply and demand for grain in each location generate price diversity. Therefore, the basis incorporates differences in time, location, delivery conditions and quality.

The basis changes over time owing to the fact that the factors that influence prices at each delivery point also tend to change. These variables include transport costs, carrying charges, the need for a particular quality (e.g., a higher percentage of protein or oils), conditioning costs, margins and taxes associated with "fobbing" and especially supply and demand conditions in each location. Even in cases where the locations coincide (as in the case of prices in Chicago, Buenos Aires and Rosario, where the delivery points for futures are the same as those for spot grain), the spot price and the delivery price on a future may not converge entirely. This generally occurs for technical reasons associated with such factors as quality specifications and delivery dates (since futures contracts are more rigid and delivery on such contracts depends on the decision of only one of the parties, the purchaser may not know exactly what quality of grain he will receive or the precise date of delivery).

Another typical cause of changes in the basis is the seasonality of grain supply, and these changes are more marked when stocks are low. Due to these changes, perfect hedges are rare. Although it is generally supposed that prices in the different markets move in the same direction, the above-mentioned factors demonstrate that this is not always the case, and under some circumstances, prices in a particular location may move in the opposite direction of futures market quotations.

Figure 9

PRICES OF WHEAT STORAGE AND STOCKS IN CHICAGO, JULY-SEPTEMBER

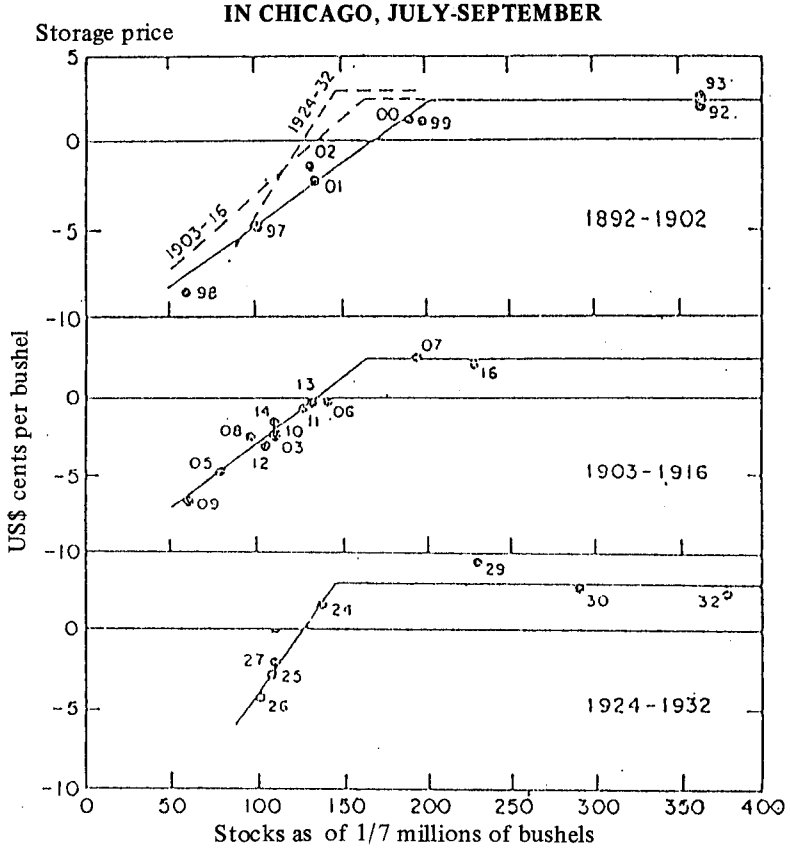
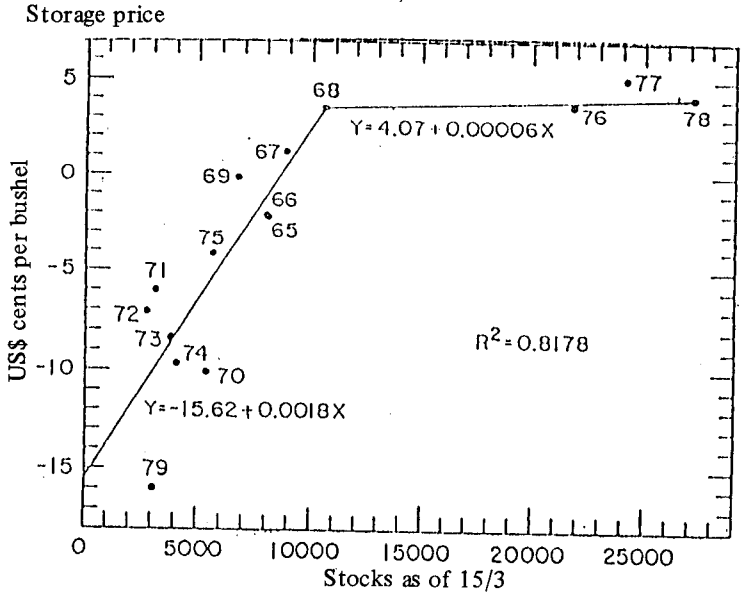


Figure 10

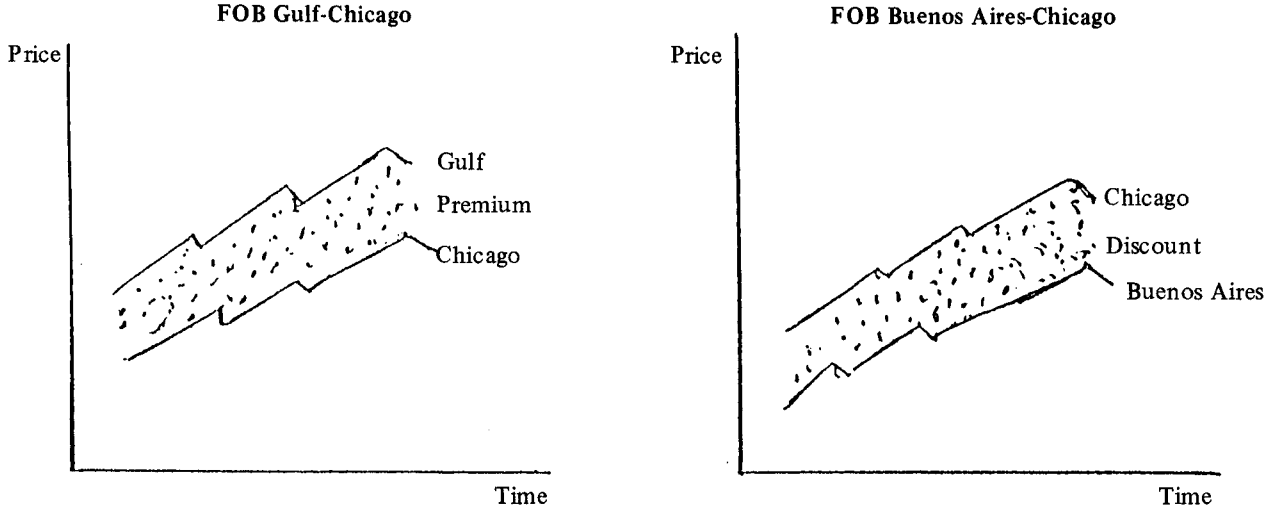
PRICES IN WHEAT STORAGE AND STOCKS IN CHICAGO, JULY-MARCH



Source: Roger Gray and Anne Peck, "The Chicago wheat futures market: recent problems in historical perspectives", *Food Research Institute Studies*, vol. 18, No. 1, 1981.

Figure 11

SPREADS BETWEEN CASH AND CHICAGO FUTURES MARKET PRICES FOR VARIOUS LOCATIONS



b) Hedges

The existence of time lags between the moment when firms take decisions (relating to production, exportation, processing) and the time when they implement them generates price risk, and hedging in futures markets is therefore of great importance as a management tool. A firm that does not hedge is speculating with spot prices and assumes all the price risk during the period required for production, marketing or processing. The greater a firm's share in the production costs, of or in the income from, unhedged inputs or products, the greater its risk and the greater the effect on its profits. Thus it is clear that grain traders, which typically add very little value (small unit margins) to the product and deal in large volumes, are the most exposed to price risk. Grain processors (edible-oil and flour mills) are in a similar situation since they too account for relatively little value added and the grain itself constitutes their main cost component. Manufacturers of finished products (crackers, bread, etc.) and producers are also subject to price risk, but it is of a lower order of magnitude. Consequently, a well-designed hedging programme is a strategic tool for grain traders. (In fact, as was discussed in chapter I, one of the main reasons for the development of futures markets in the United States in the mid-nineteenth century was the desire of traders to reduce their price risk during the period between grain production and its consumption.)

A firm operating in the physical market for grain or related products hedges by opening a position in a futures contract which is approximately equal but opposite to its existing position, or to one that it plans to take on a future date, in the physical cash market. In other words, it uses a futures contract as a temporary substitute for a planned transaction on the spot grain market (Rinehimer, 1984). The hedge transfers the firm's price risk, at least partially, to a speculator in the futures market, who hopes to derive a profit from variations (in his favour) in the price of the goods in question. The speculator is the market participant who provides the liquidity and continuity required for hedging to take place efficiently.

Grain traders (and the rest of the operators in the marketing system) buy, sell and store grain, whose prices may change and thereby affect their business and their profits; therefore, they try to cover the risk associated with each sale by means of a simultaneous purchase (or vice versa). In practice, it is very difficult to achieve this aim in the physical market, and futures markets, where large volumes are traded on a continuous basis, are therefore used as a temporary means of implementing commercial risk-reduction practices.

There are verious ways of using futures markets for hedging. The "short" hedge selling hedge, arbitrage hedging) involves owning or buying grain on the cash market and simultaneously (or

subsequently) selling an equivalent quantity in a futures market. The most typical example is that of a producer or trader (grain elevator firm, exporter) which wishes to hedge their inventory risk. In other words, their aim is to protect the value of the grain that they are storing during a given period and to obtain returns from its storage. A somewhat analogous case is that of purchases made by an official agency during the harvest period (e.g., wheat purchases made by the National Grain Board of Argentina) for which no matching export operation or domestic sale has been arranged as of the date of purchase and which are therefore subject to price variations.

In simplified terms, if the firm takes a short hedge ("goes short" in the futures market) and the price subsequently declines, then the loss it suffers when it sells its grain in the spot market will be offset by the gain it will realize in the futures market when it closes its short position (buys a contract that offsets the contract it originally sold) in that market. On the other hand, if the spot price increases, its gain on the spot market will be offset by a loss in the futures market. Thus, for example, an Argentine grain-elevator firm acquires 100 tons of corn on 10 March 1989 at a price equivalent to US$121 per ton FOB and decides to hedge against possible future decreases in the price of spot grain; it therefore sells a May contract for an equivalent quantity at US$110 per ton in Chicago on the same day. By the following month, prices have fallen and the firm decides to sell the grain to an exporter, who pays it a price equivalent to US$117.50 per ton; thus, it has lost US$3.50 per ton on its spot transaction. However, it simultaneously closes its position in Chicago (buys futures) at US$104.90 per ton, thereby making a gross profit of US$5.10 per ton. The results of these two operations are set forth below:

Basis	Date	Spot market	Futures market
+US$11 per ton	10 March 1989	Buys 100 tons of corn at US$121 per ton	Sells May contract for 100 tons of corn at US$110 per ton
+US$12.60 per ton	10 April 1989	Sells 100 tons of corn at US$117.50 per ton	Buys May contract for 100 tons of corn at US$104.90 per ton
+US$1.60 per ton	Result	Loss: US$3.50 per ton	Gain: US$5.10 per ton
	Net result	Gain of US$1.60 per ton	(Less commissions and other charges for futures operation)

In this case, the hedge protected the firm from its loss on the spot market, since prices in both markets moved in the same direction, and even generated a profit, due to the fact that prices in Chicago fell more than in Argentina (the small supply of corn in the Argentine market and the active competition of demand softened the effect of (i.e., did not fully incorporate) the fall of prices in Chicago, thereby increasing the premium for Argentine grain). Likewise, the absolute difference in the spot price (-US$3.50 per ton) was less than the variation in the basis (+US$1.60 per ton), and the hedge thus diminished the firm's price risk.

The "long" hedge (buying hedge, operational hedging) consists of the sale of grain or related products and the simultaneous purchase of an equivalent quantity in the futures market for the purpose of protecting the hedger against possible price increases until the hedging firm has purchased the grain on the cash market. Long hedges are usually taken by grain exporters and processors and are consequently the most important operations for the purposes of the present study. A typical example would be an external sale of 50 000 tons of Argentine soybeans for June shipment. At the time of the sale, the export firm does not own the grain and therefore, if it does not hedge the transaction, it will have to assume all the risk of possible price increases. Instead, however, at the same time it makes the sale, it buys a July contract (which normally is used as a base for calculating the premiums for June shipments) for an equivalent volume on the Chicago market. Thus, on 10 March 1988 it arranges to sell grain for June delivery at the prevailing FOB price of US$214 per ton and buys the July contract in Chicago at US$227.30 per ton. Over the following months, prices rise sharply on international markets as a result of a drought affecting the main producing zones in the United States, which is also reflected in FOB prices in Argentine ports. When the large Argentine harvest comes into the market in the month of May, the exporter buys soybeans in the market at the prevailing FOB price of US$244 per ton and closes its Chicago position (sells) at US$263.50 per ton. The results of these two operations are as follows:

Date	Physical market	Futures market	Basis
10 March 1988	Sells 50 000 tons of soybeans for June delivery at US$214 per ton	Buys July contract for 50 000 tons of soybeans in Chicago at US$227.30 per ton	-US$13.30 per ton
10 May 1988	Buys 50 000 tons of soybeans for June shipment at US$244 per ton	Sells July contract for 50 000 tons of soybeans in Chicago at US$263.50 per ton	-US$19.50 per ton

Net result: Gain of US$6.20 per ton (less futures market expenses).

In the above case by hedging in the futures market the firm was able to cover its loss in the Argentine FOB market, since prices in this market moved in the same direction as those in the Chicago market, and to realize a gain of US$6.20 per ton, owing to the fact that the basis decreased for Argentine ports (the drought was in the United States and therefore the supply shortage was relatively greater in that country). The absolute difference in FOB prices (-US$30 per ton) was greater than the variation of the basis (-US$6.20 per ton); therefore the hedge reduced the firm's risk.

The example provided above corresponds to a type of export operation that is frequently performed by large export firms and consists of a sale FOB at destination and the subsequent purchase of the grain by the exporter in the FOB market. Another alternative would be that the Argentine exporter could try to obtain the grain in the local market, in which case the purchase price would be the spot price FAS (the price in the local grain exchange in Buenos Aires or Rosario). This price would then be converted to an FOB price by adding the loading costs and recalculated based on the prevailing exchange rate. In the above example, the FOB price calculated on the basis of the FAS price of 10 May 1988 was US$241.80 per ton, and the operation would therefore have yielded an additional profit of US$2.20 per ton, owing to the fact that the actual purchase price would be less than the FOB market price.

Similar calculations may be made in the case of a soybean processing plant which commits itself to a future sale of soybean oil and meal without yet having the grain required to process these products. Through the use of a simple long hedge, the producer can try to maintain his milling margin at the level at which it stood when he committed himself to the sale of the processed products. Thus, for example, in August a processing plant sells 1 620 tons of soybean meal at US$192.50 per ton and 360 tons of soybean oil at US$360 per ton for October delivery; the processor hopes to obtain a milling margin of US$17 per ton, since he expects to purchase the grain at US$203.70 per ton, and the income to be received by the mill from each ton of soybeans (18% yield in oil and 81% yield in meal) will be US$220.70 per ton. At the time of the sale, he does not have the grain on hand, and he therefore hedges against an eventual increase in price by buying November contracts for 2 000 tons of grain in Chicago at US$211.30 per ton. In September he acquires the grain in the spot market at US$214.70 per ton and simultaneously closes his position (sells) in Chicago at US$220.20.

The results of these two operations are:

Date	Spot market	Futures market	Premium
August 1987	Expects to acquire 2 000 tons of soybeans at US$203.70 per ton	Buys November contracts in Chicago for 2 000 tons of soybeans at US$211.30 per ton	-US$7.60 per ton
September 1987	Buys 2 000 tons of soybeans at US$214.70 per ton	Sells November contracts in Chicago for 2 000 tons of soybeans at US$220.20 per ton	+US$5.50 per ton
Result	Loss of US$11 per ton (total loss: US$22 000)	Profit of US$8.90 per ton (total profit: US$17 800)	Change -US$2.10 per ton
Net result	Loss of US$2.10 per ton (total loss: US$4 200)	Mill margin	US$14.90 per ton

Thus, the long hedge in Chicago permitted the processor to reduce his loss from US$11 per ton to US$2.10 per ton; the change in the basis was substantially less than the price increase, since both quotations (cash and futures prices) moved in the same direction. The lack of total parallelism meant that the mill margin declined to US$14.90 per ton.

A soybean mill could also engage in combined hedging, whereby it would buy soybean futures and sell soybean oil and meal futures. Potential mill margins could then be calculated daily on the basis of each day's Chicago futures prices for the three commodities and a given point in time could be selected for arranging a three-way hedge prior to the actual purchase of the grain and the sale of the processed products on the spot market. Thus, as shown in the preceding example, in August 1987 the processing plant could have taken a long hedge, as described above, for the purpose of avoiding the risk of price increases; but at the same time it could also have sold December contracts in Chicago for 360 tons of soybean oil and 1 620 tons of soybean meal at the prevailing prices (US$382.50 per ton for soybean oil and US$196.90 per ton for meal), thereby taking short hedges to protect itself against possible falls in the prices of the processed products. The long hedge and its results is described above; the other hedges and their results are as follows:

Date	Spot market	Futures market	Basis
August 1987	Expects to sell 360 tons of soybean oil in October at US$360 per ton	Sells December contracts in Chicago for 360 tons of soybean oil at US$382.50 per ton	-US$22.50 per ton
October 1987	Sells 360 tons of soybean oil at US$416.30 per ton	Buys contracts in Chicago for 360 tons of soybean oil at US$438.80 per ton	-US$22.50 per ton
Result	Gain of US$56.30 per ton (total gain: US$20 268)	Loss of US$56.30 per ton (total loss: US$20 268)	No change
August 1987	Expects to sell 1 620 tons of soybean meal in October at US$192.50 per ton	Sells December contracts for 1 620 tons of soybean meal in Chicago at US$196.90 per ton	-US$4.40 per ton
October 1987	Sells 1 620 tons of soybean meal at US$209 per ton	Buys December contracts for 1 620 tons of soybean meal in Chicago at US$211.20 per ton	-US$2.20 per ton
Result	Gain of US$16.50 per ton (total gain: US$26 730)	Loss of US$14.30 per ton (total loss: US$23 166)	+US$2.20 per ton
Result	Loss of US$0.30 per ton-soybeans (636/2 000)	Mill margin	US$16.70 per ton
Total	US$636 in total (26 730-23 166-4 200)		

The result of the operations in the spot and futures markets was a reduction of the expected mill margin from US$17 per ton to US$16.70 per ton, bringing the total margin for the 2 000 tons that were processed to US$33 400, as detailed below:

a) Spot operations:

	Thousands of dollars
Sale of 1 620 tons of soybean meal at US$209 per ton	338.60
Sale of 360 tons of soybean oil at US$416.30 per ton	149.90
Purchase of 2 000 tons of soybeans at US$214.70 per ton	-429.40
Commercial margin	+59.10

b) Futures operations:

Soybeans	Profit of US$8.90 per ton on 2 000 tons	17.80
Oil	Loss of US$56.30 per ton on 360 tons	-20.30
Meal	Loss of US$14.30 per ton on 1 620 tons	-23.20
		-25.70

c) Total margin 33.40

In this example hedging permitted the processor to obtain a margin very similar to that originally expected, appreciably diminishing the price risk. It should also be noted that in this case if the processor had abstained from hedging his margin would have been larger, since the price variations in the spot markets for soybeans and processed products were such as to increase mill margins.

c) Anticipatory hedging

Anticipatory hedging represents another possible way of using futures markets. This type of hedge consists of the sale (or purchase) of futures prior to a sale (or purchase) of grain or related products on the spot market. This is the alternative which is chosen for most of the hedges taken by producers prior to the harvest, some of the forward sales made by grain exporters, a portion of the sales and purchases made by grain processors and a substantial proportion of the hedging done by importers. Anticipatory hedging differs conceptually from the types of hedges described above in that its chief aim is speculative, since a certain point in time is selected for making a sale or purchase on the basis of a judgement concerning the price levels prevailing in the futures market, without reference to the actual grain transaction. The trading decision is taken mainly for the purpose of locking in what is considered to be a good price based on a prior analysis of the market or a given trading criterion; in other words it is a decision similar in nature to those taken by speculators in the futures markets. For this reason, the risk

reduction afforded by anticipatory hedging does not have the same scope as that provided by operational or arbitrage hedging since it cannot be quantified in a similar way. In this case risk is reduced only in the sense that a sale or purchase price can be set for a transaction that will not occur immediately.

In planning what crops to grow, a producer takes into account a series of expected prices for each of the grains or related products under consideration. The going prices in futures markets for the next growing season (adding or substracting the premiums that correspond to the producer's particular situation) may be used as a guide for price determination. Once the decision to produce is taken, the producer may try to lock in those prices (at least for a certain percentage of the expected harvest) and thereby reduce the risk of possible price declines during the production cycle by arranging forward sales or by selling futures. Both alternatives have advantages and limitations, but they may be used in tandem in order to optimize a firm's marketing strategies (Nelson, 1985). This is all the more true because in many cases it is not possible to arrange forward sales, whereas futures sales constitute an ongoing and more liquid alternative which, in addition, carries an institutional guarantee of contract peformance (provided by the futures market's clearing house) that is absent in the case of forward sales, which therefore entail an added risk (Paul, Heifner, Gordon, 1985),[19] In practice, an anticipatory hedge by a producer consists of an operation similar to that of a short hedge in which, at a given point in time, the producer sells grain futures for a delivery month close to the date when he actually expects to sell the grain on the spot market. Later, on the date of the sale, he closes his position (purchases futures); in this way he reduces the impact of possible price falls, but relinquishes the opportunity of making a larger profit in the event that prices should rise. Normally, delivery is not made or taken on futures contracts, since their specifications do not always match the characteristics of the grain that the producer can provide; in addition, the logistics of the delivery are often a constraint (the day and place of delivery may not be advantageous for the producer). In some cases, however, differences in the price trends on the spot and futures markets (change in the basis) make physical delivery more attractive.

Owing to the fact that sales by producers are made FAS and therefore entail a greater basis risk with respect to Chicago quotations, these operators generally prefer to use local futures markets.

Anticipatory hedging offers great potential benefits to export agencies and firms that routinely acquire grain in the local market (e.g., the National Grain Board (JNG) of Argentina, export cooperatives, and the Australian Wheat Board) for sale abroad. Systematic monitoring of the market by such organizations permits them to evaluate the advisability of arranging sales at times when they do not have grain on hand or have the grain but not the

buyers. For example, a second-line cooperative knows in advance that in each growing season it should export 300 000 tons of corn during the months of April, May and June. In January 1989, it finds that it is to its advantage to sell, because it foresees a fall in prices. Since at that time its customary buyers from Japan and the Soviet Union have not come forth, on 10 January 1989 it decides to sell May futures in Chicago for 200 000 tons at US$116.20 per ton (on that date the premium for Argentine corn is +US$6.80 per ton over May contracts in the Chicago market, or, in other words, the FOB price for April/May/June deliveries is US$123 per ton). On 10 April 1989 it sells 200 000 tons to Japanese cooperatives at the prevailing FOB price of US$117.50 per ton and closes its position (buys) in the Chicago futures market at US$104.90 per ton. The result is the following:

a) Sale not covered by an anticipatory hedge at US$117.50 per ton

b) Sale covered by an anticipatory hedge at US$117.50 per ton + gain in the futures market

US$117.50 per ton + (US$116.20 per ton - US$104.90 per ton - futures market expenses) = US$128.80 per ton - futures market expenses

In this case, the cooperative's sale price for the corn was increased from US$117.50 to US$128.80 per ton because the anticipatory sale of corn futures in Chicago protected it from the drop in FOB prices (from US$123 to US$117.50 per ton) and permitted it to take advantage of the increase in the Argentine corn premium (from +US$6.80 to +US$12.60 per ton). It should be noted that in this example, since the price fell by US$5.50 per ton and the premium increased by US$5.80 per ton, the basis risk was greater than the price risk; in other words, the cooperative's risk was not reduced by its hedge but rather the basis moved in its favour.

Some analysts have referred to the advantages of this type of hedging in discussing the reasons for the use of United States futures markets by the Australian Wheat Board (Sheales and Tomek, 1987).

Several authors have emphasized the usefulness of anticipatory hedging for large grain purchases by developing countries (Peck, 1982; Edwards, 1983). The use of futures markets clearly provides these countries with a greater information base, but in addition it also gives them more flexibility in setting prices when they find it advantageous to do so, permits them to reduce their risk, helps them to arrive at a more accurate estimate of their foreign exchange requirements, and reduces the need for storage during prolonged periods. Flexibility in selecting the right moment to buy can, in theory, lower average purchase prices (the inverse of the situation described earlier). However, since studies on futures

prices show them to be unbiased predictors of price variations for spot grain (Fry and Kofi, 1983; Just and Rausser, 1981), it cannot be statistically proven that such flexibility makes it possible to obtain price advantages. The improvement depends entirely on the speculative hedges' "goodress of fit".

d) Options

Grain producers, processors and exporters may also reduce their risk through the use of futures options, which are also traded on the floor of United States futures exchanges. Options on wheat, corn, soybean, soybean oil, soybean meal and other futures (silver, Treasury bonds, etc.) are traded in Chicago and opting on wheat futures are traded on the Kansas exchange. The purchase of an option conveys the right, but not the obligation, to buy (a "call option") or sell (a "put option") a specified futures contract at a specific price (the "strike price") at any time during the life of the option. Options expire in the month immediately preceding that of the contract to which they refer (for example, an option on a November soybean contract expires in October). At any given point in time, options having different strike prices, which are based on the prevailing quotations for each futures contract, are traded for each of the delivery months of the commodity in question. Thus, for example, in January, it is possible to trade options on March, May, July, August, September and November soybean futures, and the strike prices for the May contract may be US$5.25 - US$5.50 - US$5.75 - US$6.00 - US$6.25 - US$6.50 - US$6.75 per bushel, if the price of this contract is US$6.00 per bushel (possibly varying if futures quotations change).

The buyer of an option may, if he considers it advisable after comparing the market price with the strike price of the option, exercise his right to buy or sell the futures contract at that price. An exchange for this right he pays a "premium" (which is negotiated on the exchange floor in much the same way as is done with futures) to the seller or "writer" of the option. The writer undertakes to honour the terms of the option (and thereby assumes the risk of possible price changes), in return for which he receives the premium. In order to ensure fulfilment, the exchange requires the seller to deposit margins to cover price variations, just as in the case of futures contracts, whereas the buyer pays only the premium and does not have to deposit margins.

The buyer of a call option obtains protection against future price increases (similarly to hedging with futures) but does not have the possibility of benefiting from price falls. The buyer of a put option obtains protection against possible future declines in prices (as in the case of a hedge or a forward sale), but does not have the possibility of benefiting from price increases.

The options market offers four different alternatives for use in marketing strategies: i) the purchase of call options; ii) the purchase of put options; iii) the sale of call options; and iv) the sale of put options.

A call option may be purchased by a producer (or exporter) who harvested soybeans in May, for example, and wants to benefit from an expected price increase over the next few months but, due to financial constraints or limited storage capacity (or the demand of one of his customary importers), finds himself obliged to sell immediately. One of his alternatives is to sell the soybeans (obtain the money, arrange for storage, satisfy his regular customer) in May and buy a call option on a September contract in Chicago. At that moment the September contract is quoted at US$6 per bushel, and he can buy a call option at that price by paying a premium of US$0.15 per bushel. If the September contract price rises to US$6.50 per bushel in August (the expiration month of the option), his option will have an intrinsic value of US$0.50 per bushel, and he therefore will be able to sell it at a profit of US$0.35 per bushel (US$0.50 - US$0.15); if the August quotation for the September contract is US$6.05 per bushel, its intrinsic value will be US$0.05 and the operation will therefore entail a loss of US$0.10 per bushel (US$0.05 - US$0.15). The maximum loss would be US$0.15 if the September contract were quoted at US$6 per bushel or less at the time the option expired, in which case he would not exercise the option. This is a typical example of a speculative operation (which is similar, but with the time sequence reversed, to anticipatory hedging), which permits a trader to speculate in future price increases while limiting his risk (the negotiated cost of the premium represents the upper limit of his potential losses).

A put option may be purchased at a specified price by, for example, a corn producer during the growing season for that crop if he wishes to be sure that he will receive at least that price (the strike price of the option) for his crop at the time of the harvest. An exporter might also purchase a put option as a means of locking in a minimum sale price for the marketing period and thereby protect himself against possible price decreases while at the same time being in a position to take advantage of any subsequent price increases. The cost of such an operation is the option premium. Using the above example let us suppose that in December the corn producer (or the exporter) buys a put option on a May corn contract in the futures market at a price of US$2.80 per bushel, which costs him US$0.10 per bushel. In subsequent months the demand of importing countries is weak and the price of corn falls in Chicago. In April, the May contract is quoted at US$2.50 per bushel, so the "put" of US$2.80 has an intrinsic value of US$0.30 per bushel.

Thus, the low price at which he will sell his corn on the spot market (calculated on the basis of the Chicago price of US$2.50) will be partially counterbalanced by the profit he makes on the

option. The offset is only partial because his gain will be only US$0.20 (US$0.30 minus the premium that he paid of US$0.10). He would not have incurred this reduction in his gain of US$0.30 per bushel if he had chosen to use an anticipatory hedge in the futures market instead. On the other hand, if the price of born had increased to US$3.10 per bushel, he would have allowed the option to lapse and could have sold his corn at US$3.10 per bushel for a net income of US$3.00 owing to the US$0.10 cost of the option premium (this may be considered as the cost of the price "insurance"). If the producer had made a forward sale or had hedged at US$2.80, he would not have benefited from the price increase. Moreover, if the producer has arranged a forward sale and his harvest is smaller than expected owing to bad weather, he will be faced with the difficulty of having to acquire corn in order to meet his commitment, while if he hedges, he will have to make margin deposits, which may pose financial problems and other difficulties, especially in the case of producers located at some distance from the futures markets.

The sale of a call option is generally conducted for the purpose of gaining the premium, when the seller does not expect prices to increase significantly during the life of the option or expects them to decline. The option writer is wagering that the option will be allowed to expire rather than being exercised, in which case he will receive the full amount of the premium as a profit.

The sale of call options may be "hedged" with merchandise stocks or may be totally speculative (when not covered by grain in storage). In the first case, a producer, grain elevator firm or exporter that is holding soybean inventories and believes that the prevailing price of US$6 per bushel will be maintained without significant change in the coming months might decide to sell a call option on futures priced at US$6 per bushel for a premium of US$0.25 per bushel. If the option is about to expire and the price has remained at US$6 per bushel, the buyer will not exercise the option and the seller will be able to sell the soybeans at US$6.25 per bushel (US$6 in the market and US$0.25 from the premium). Alternatively, if the price of soybeans climbs to US$6.50 per bushel, the option will be exercised at the price of US$6 per bushel, and the option writer will sustain a loss of US$0.25 per bushel, i.e., a loss of US$0.50 per bushel less the US$0.25 per bushel he received in the form of the premium (in effect, he sold his soybeans at US$6.25 instead of US$6.50 per bushel).

Put options are usually sold by speculators who either do not expect substantial price decreases or else foresee price rises. If events bear out these expectations, the options will be allowed to lapse and the seller receives the premium as a profit.

On the other hand, a processor of soybeans who writes (sells) put options can obtain some degree of price protection and increase

his mill margins if prices remain stable. If a processing plant sells soybean oil and soybean meal for delivery a few months hence without having soybean stocks on hand, it will be exposed to the risk of price increases during the period between the sale of the processed products and the purchase of the soybeans. If prices rise, its margin will shrink and it may therefore decide to sell put options in an attempt to protect itself against such an eventuality. Let us suppose that such a plant sells "puts" at US$6 per bushel for a premium of US$0.30 per bushel. Its soybeans rise to US$6.20 per bushel, the option buyer will let it lapse. The plant will have to buy soybeans in the spot market at US$6.20 per bushel (which would entail a reduction of its expected mill margin, since the margin was calculated assuming a soybean price of US$6). On the other hand, however, it realizes a profit of US$0.30 per bushel on the premium, so the final result is an increase of US$0.10 per bushel. The break-even point would be US$6.30, and any price increases in excess of that amount would reduce the expected mill margin, but would be partially offset by the premium received by the plant. If, on the contrary, the price of soybeans declined to US$5.60 per bushel, the purchaser of the put option would exercise it, and the plant would have to buy soybean futures at US$6 per bushel, that could not be sold on the market for any more than US$5.60. Its net loss in the futures market would be US$0.10 per bushel, since the US$0.40 difference would be partially covered by the premium of US$0.30. At the same time, though, the processor could acquire the grain in the spot market at a price of US$5.60, which, when the processor's US$0.10 per bushel loss on the futures market is incorporated, represents a purchase price of US$5.70, or US$0.30 per bushel less than the figure calculated at the time it arranged the sale of the processed products. Thus, the effective mill margin has been increased by US$0.30 per bushel. In other words, when prices hold steady or fall, the processor locks in his purchase price at US$5.70 per bushel, i.e., the strike price minus the premium.

The above examples of options trading used prices expressed in dollars per bushel owing to the fact that such transactions can only be conducted in futures markets of the United States (and other developed countries). Options are not traded on the Argentine and Brazilian exchanges; in the futures markets of Rosario and Buenos Aires it is possible, however, to trade in futures based on FAS conditions, in local currency and in dollars, whereas the São Paulo exchange operates in the local currency. These circumstances limit the actual opportunities for producers in those countries to use options to any great extent in their marketing strategies. In practice, only a small percentage of large-scale modern producers could operate internationally (in fact, producers in the United States are also faced with problems of access, and therefore use futures markets only to a quite limited extent (Tomek, 1988).

Furthermore, in order to simplify these analyses, the tendency is to equate futures quotations with spot prices, on the assumption that the trends in these two prices are parallel.

However, this is not always the case. In fact, an analysis of price series in the United States and the Latin American countries confirms that, in some circumstances, price trends in Argentina and Brazil have moved in the opposite direction to that of trends in United States futures markets (see tables 22, 23 and 24). When dealing with markets in competitor countries, or in very different locations, or in countries whose agricultural policies may affect the markets in differing ways (as is the case of the FAS or FOB markets of Argentina and Brazil in relation to United States futures markets), the risk represented by variations in the premiums is greater (see tables 12, 13 and 14). For this reason, hedging does not have the same impact within the United States as it has in the Latin American and Caribbean countries. In some instances, price variations are smaller than the variation in the premiums (as is shown in tables 25, 26 and 27 for Argentina), and this risk may therefore be greater than the price risk.

Under such circumstances, operators will not hedge abroad, but will use local futures markets instead. The trade-off of this is the underdevelopment of these markets, their lack of liquidity and trading restrictions which seriously limit their use (Masera, 1987; Marsana, 1988).

Changes in the premiums over Chicago for the FOB market at Argentine ports are more marked between months than within the same month. The effects of their reversed seasonality and of the factors that influence local supply and demand are usually reflected over long periods whereas, normally, within short time frames (one or two months) the premiums tend to remain fairly steady, and the variations in FOB prices therefore reflect price trends in Chicago quite well.

The concepts analysed earlier indicate that, in order to decide when and in what markets hedging should be undertaken, it is necessary to make a detailed analysis of the premiums at each point in time and in each market, bearing in mind the many factors that are involved in the formation of each month's prices.

The uncertainty that exists with respect to the level that the basis will reach on a specific date is referred to as the "basis risk". The quantification of this risk and the identification of factors affecting the behaviour of the basis are fundamental tools for operating efficiently in futures markets, since effective strategies usually involve what is called "hedging the basis" (by means of either short or long hedges, as appropriate).

Table 22

SPOT WHEAT PRICE TRENDS IN THE BUENOS AIRES FOB MARKET (OR FOR FORWARD CONTRACTS) AND RELEVANT FUTURES QUOTATIONS FOR THE VARIOUS MONTHS

1985		10/9	10/10	11/11	10/12		10/1	10/2	10/3
FOB Buenos Aires	J/F/M	93.00	92.00	96.00	114.00	March		101.50	
Kansas	March	112.25	115.38	121.71	123.74	March	117.58	116.48	123.46
1986		10/9	10/10	10/11	10/12		9/1	10/2	10/3
FOB Buenos Aires	J/F/M	78.00	83.00	81.00	78.00	March	83.00	93.00	94.00
Kansas	March	91.49	92.41	93.33	93.61	March	93.15	96.54	105.91
1987		10/9	9/10	10/11	10/12		11/1	10/2	10/3
FOB Buenos Aires	J/F/M	89.00	94.00	95.00	96.00	March	94.00	103.00	
Kansas	March	107.75	111.15	106.47	112.44	March	115.74	118.32	109.13
1988		9/9	11/10	11/11	9/12		10/1	10/2	10/3
FOB Buenos Aires	J/F/M	150.00	148.00	151.00	149.00	March	160.00		153.00
Kansas	March	151.57	158.00	155.98	153.87	March	161.03	156.71	160.76

Source: On the basis of data compiled by the National Grain Board.

Table 23

SPOT CORN PRICE TRENDS IN THE BUENOS AIRES FOB MARKET (OR FOR FORWARD CONTRACTS) AND RELEVANT FUTURES QUOTATIONS FOR THE VARIOUS MONTHS

1985		10/12	10/1	11/2	11/3	10/4		10/5	11/6	10/7
FOB Buenos Aires	A/M/J	-	107.00	107.00	105.00	110.00	July	108.00	110.00	111.00
Chicago	May	110.03	108.16	109.44	107.47	111.12	July	109.84	108.95	106.20
1986		10/12	10/1	11/2	11/3	10/4		9/5	11/6	10/7
FOB Buenos Aires	A/M/J	98.00	100.50	89.50	86.50	83.00	July	93.75	92.50	80.00
Chicago	May	97.53	99.40	94.48	90.74	89.76	July	94.38	92.22	77.85
1987		10/12	9/1	10/2	10/3	9/4		11/5	9/6	10/7
FOB Buenos Aires	A/M/J	69.00	64.00	66.00	68.00	70.00	July		81.00	
Chicago	May	69.68	64.47	62.50	60.73	64.76	July	78.15	73.91	65.74
1988		10/12	11/1	10/2	10/3	11/4		10/5	10/6	11/7
FOB Buenos Aires	A/M/J	86.00	86.00	87.50	84.50	82.50	July			
Chicago	May	77.75	78.93	82.18	80.41	81.79	July	82.18	101.47	113.48
1989		9/12	10/1	10/2	10/3	10/4		10/5	10/6	10/7
FOB Buenos Aires	A/M/J	113.50	123.00	115.25	121.00	117.50	July			
Chicago	May	108.26	116.23	107.28	110.03	104.92	July			

Source: On the basis of data compiled by the National Grain Board.

Table 24

SPOT SOYBEAN PRICE TRENDS IN THE BUENOS AIRES FOB MARKET (OR FOR FORWARD CONTRACTS) AND RELEVANT FUTURES QUOTATIONS FOR THE VARIOUS MONTHS

1985		10/1	11/2	11/3	10/4	10/5		10/7	9/8
FOB Buenos Aires	June		210.00	200.00	209.00	200.00	August	202.00	206.00
Chicago	July	223.77	225.06	219.64	223.77	216.70	August	207.79	190.89
1986		10/1	10/2	10/3	10/4	9/5		10/7	11/8
FOB Buenos Aires	June		198.00	191.00	185.00	192.00	August		188.00
Chicago	July	208.06	201.36	198.51	192.08	199.24	August	186.38	184.36
1987		9/1	10/2	10/3	9/4	11/5		10/7	10/8
FOB Buenos Aires	June	175.00	171.00	169.00	181.00	209.00	August	216.00	204.00
Chicago	July	182.62	180.32	178.67	188.68	212.47	August	197.87	190.06
1988		11/1	10/2	10/3	11/4	10/5		11/7	10/8
FOB Buenos Aires	June	226.00	221.00	214.00	245.00	244.00	August	315.00	310.50
Chicago	July	234.15	231.40	227.26	254.45	263.45	August	322.24	317.65
1989		10/1	10/2	10/3	10/4	10/5		10/7	10/8
FOB Buenos Aires	June	290.00	264.00	272.00	258.00	August			
Chicago	July	305.71	276.68	285.87	268.51	August			

Source: On the basis of data compiled by the National Grain Board.

Table 25

RESULTS OF HYPOTHETICAL HEDGES ON ARGENTINE WHEAT IN THE KANSAS EXCHANGE

	Spreads with respect to last month		
	September	October	November
1985			
Spread FOB (A)	21.00	22.00	18.00
Spread Kansas (B)	-11.49	-8.36	-2.03
Result of hedge (A+B)	9.51	13.64	15.97
1986			
Spread FOB (A)	0.00	-5.00	-3.00
Spread Kansas (B)	-2.12	-1.20	-0.28
Result of hedge (A+B)	-2.12	-6.20	-3.28
1987			
Spread FOB (A)	7.00	2.00	1.00
Spread Kansas (B)	-4.69	1.29	-5.97
Result of hedge (A+B)	2.31	0.71	-4.97
1988			
Spread FOB (A)	-1.00	1.00	-2.00
Spread Kansas (B)	-2.30	4.13	2.11
Result of hedge (A+B)	-3.30	5.13	0.11
	Spreads between successive months		
1985			
Spread FOB (monthly) (A)	1.00	-4.00	-18.00
Spread Kansas (monthly) (B)	3.13	6.33	2.03
Result of hedge (A+B)	4.13	2.33	-15.97
1986			
Spread FOB (monthly) (A)	-5.00	2.00	3.0
Spread Kansas (monthly) (B)	0.92	0.92	0.28
Result of hedge (A+B)	-4.08	2.92	3.28
1987			
Spread FOB (monthly) (A)	-5.00	-1.00	-1.0
Spread Kansas (monthly) (B)	3.40	-4.68	5.97
Result of hedge (A+B)	-1.60	-5.68	4.9
1988			
Spread FOB (monthly) (A)	2.00	-3.00	2.00
Spread Kansas (monthly) (B)	6.43	-2.02	-2.11
Result of hedge (A+B)	8.43	-5.02	-0.11

Source: On the basis of data compiled by the National Grain Board.
Note: Price spreads were calculated on the basis of the data shown in table 22. The intertemporal differences in each market were then compared with the other market order to calculate the result of the hedges.

Table 26

RESULTS OF HYPOTHETICAL HEDGES ON ARGENTINE CORN IN THE CHICAGO EXCHANGE

		Spreads with respect to the last month			
		December	January	February	March
1985					
Spread FOB	(A)	ERR	3.00	3.00	5.00
Spread Chicago	(B)	-1.09	-2.96	-1.68	-3.65
Result of hedge	(A+B)	-1.09	0.04	1.32	1.35
1986					
Spread FOB	(A)	-15.00	-17.50	-6.50	-3.50
Spread Chicago	(B)	7.77	9.64	4.72	0.98
Result of hedge	(A+B)	-7.23	-7.86	-1.78	-2.52
1987					
Spread FOB	(A)	1.00	6.00	4.00	2.00
Spread Chicago	(B)	4.92	-0.29	-2.26	-4.03
Result of hedge	(A+B)	5.92	5.71	1.74	-2.03
1988					
Spread FOB	(A)	-3.50	-3.50	-5.00	-2.00
Spread Chicago	(B)	-4.04	-2.86	0.39	-1.30
Result of hedge	(A+B)	-7.54	-6.36	-4.61	-3.30
1989					
Spread FOB	(A)	4.00	-5.50	2.25	-3.50
Spread Chicago	(B)	3.34	11.31	2.36	5.11
Result of hedge	(A+B)	7.34	5.81	4.61	1.61
		Spreads between successive months			
1985					
Spread FOB (monthly)	(A)	ERR	0.00	2.00	-5.00
Spread Chicago (monthly)	(B)	-1.87	1.28	-1.97	3.65
Result of hedge	(A+B)	-1.87	1.28	0.03	-1.35
1986					
Spread FOB (monthly)	(A)	-2.50	11.00	3.00	3.50
Spread Chicago (monthly)	(B)	1.87	-4.92	-3.74	-0.98
Result of hedge	(A+B)	-0.63	6.08	-0.74	2.52
1987					
Spread FOB (monthly)	(A)	5.00	-2.00	-2.00	-2.00
Spread Chicago (monthly)	(B)	-5.21	-1.97	-1.77	4.03
Result of hedge	(A+B)	-0.21	-3.97	-3.77	2.03
1988					
Spread FOB (monthly)	(A)	0.00	-1.50	3.00	2.00
Spread Chicago (monthly)	(B)	1.18	3.25	-1.77	1.38
Result of hedge	(A+B)	1.18	1.75	1.23	3.38
1989					
Spread FOB (monthly)	(A)	-9.50	7.75	-5.75	3.50
Spread Chicago (monthly)	(B)	7.97	-8.95	2.75	-5.11
Result of hedge	(A+B)	-1.53	-1.20	-3.00	-1.61

Source: On the basis of data compiled by the National Grain Board.
Note: Price spreads were calculated on the basis of data shown in table 23. The intertemporal differences in each market were then compared with the other market order to calculate the result of the hedges.

Table 27

RESULTS OF HYPOTHETICAL HEDGES ON ARGENTINE SOYBEANS IN THE CHICAGO EXCHANGE

		Spreads with respect to the last month			
1985					
Spread FOB	(A)	ERR	-10.00	0.00	-9.00
Spread Chicago	(B)	7.07	8.36	2.94	7.07
Result of hedge	(A+B)	7.07	-1.64	2.94	-1.93
1986					
Spread FOB	(A)	ERR	-6.00	1.00	7.00
Spread Chicago	(B)	8.82	2.12	-0.73	-7.16
Result of hedge	(A+B)	8.82	-3.88	0.27	-0.16
1987					
Spread FOB	(A)	34.00	38.00	40.00	28.00
Spread Chicago	(B)	-29.85	-32.15	-33.80	-23.79
Result of hedge	(A+B)	4.15	5.85	6.20	4.21
1988					
Spread FOB	(A)	18.00	23.00	30.00	-1.00
Spread Chicago	(B)	-29.30	-32.05	-36.19	-9.00
Result of hedge	(A+B)	-11.30	-9.05	-6.19	-10.00
1989					
Spread FOB	(A)	-32.00	-6.00	-14.00	
Spread Chicago	(B)	37.20	8.17	17.36	
Result of hedge	(A+B)	5.20	2.17	3.36	
		Spreads between successive months			
1985					
Spread FOB (monthly)	(A)	ERR	10.00	-9.00	9.00
Spread Chicago (monthly)	(B)	-1.29	-5.42	4.13	-7.07
Result of hedge	(A+B)	-1.29	4.58	-4.87	1.93
1986					
Spread FOB (monthly)	(A)	ERR	7.00	6.00	-7.00
Spread Chicago (monthly)	(B)	-6.70	-2.85	-6.43	7.16
Result of hedge	(A+B)	-6.70	4.15	-0.43	-0.16
1987					
Spread FOB (monthly)	(A)	4.00	2.00	-12.00	-28.00
Spread Chicago (monthly)	(B)	-2.30	-1.65	10.01	23.79
Result of hedge	(A+B)	1.70	0.35	-1.99	-4.21
1988					
Spread FOB (monthly)	(A)	5.00	7.00	-31.00	1.00
Spread Chicago (monthly)	(B)	-2.75	-4.14	27.19	9.00
Result of hedge	(A+B)	2.25	2.86	-3.81	10.00
1989					
Spread FOB (monthly)	(A)	26.00	-8.00	14.00	
Spread Chicago (monthly)	(B)	-29.03	9.19	-17.36	
Result of hedge	(A+B)	-3.03	1.19	-3.36	

Source: On the basis of data compiled by the National Grain Board.
Note: Price spreads were calculated on the basis of data shown in table 24. The intertemporal differences in each market were then compared with the other market order to calculate the result of the hedges.

There is a great deal of literature available in the United States on the subject of the behaviour and management of the basis, and the commission houses regularly provide consulting services concerning this matter to their clients. This is not the case in Argentina and Brazil, however, where such studies for the local markets are scarce and those that do exist are not readily available. This is a handicap for market operators, since a firm which does not have a solid understanding of the basis and of how it behaves will not be able to maximize its profits (Oster, 1984).

2. The use of futures markets: services provided by commission houses and other agents

Very few firms that decide to participate in futures markets become members of the exchanges and they must therefore operate through commission houses which do belong to them.[20] It will be recalled, from the first part of the text, that when a non-member producer, grain broker, exporter, etc., decides to trade in a futures market through a given commission house, he must open an account. For this purpose, the firm designates an account executive who will be in charge of the relationship between the commission house and the client and will instruct him to obtain the necessary information to verify that the client's economic backing and reputability are such as to enable him to assume the capital risk involved in futures operations.

To open an account the client must sign a contract or account agreement (which does not vary significantly from one commission house to another) which sets forth the responsibilities and obligations of each of the parties and the procedures to be followed in the event of disputes. It also usually includes an authorization for the broker to transfer funds among the different accounts that a client may have for different products, as well as a letter in which the client agrees to assume liability for amounts in excess of the margins deposited (Teweless, 1984). Once the client has deposited in the account the sum required by the commission house as an initial margin in this account, he may begin to operate.

When a client decides to trade, he must give the commission house purchase or sale orders for a specific product and position; this is usually done by telephone, unless the client happens to be in the broker's central office. This order is immediately transmitted by telephone, direct line or teletype to the floor broker; the same occurs with orders given to Argentine or Brazilian subsidiaries of the commission houses, which communicate directly with the floor brokers.

During the trading session the floor brokers congregate in various "pits", in which each commodity is traded using the open outcry method; the brokers who are buying and selling communicate

with each other by means of hand signals that indicate the orders they are executing. Once a transaction has been concluded between two brokers, both of them notify their respective offices, which then immediately inform their clients by telephone. Written confirmation of the transaction is also sent to the client by mail or fax. When the broker is trading on his own behalf, this procedure is of course not necessary.

It is very important for clients to be apprised of the terms of each contract traded in a given futures market: the amount involved, how the prices are expressed, and the maximum and minimum permissible fluctuations. It is also important to know how to place orders correctly in order to avoid costly errors. When a purchase or sale order for grain futures is placed in Chicago or Kansas, the amount must be expressed in thousands of bushels (not the number of contracts). Thus, for example, the sale of May 1989 contracts for 25 000 bushels of corn will be expressed as "SELL 25 MAY 1989 CORN". For other commodities the number of contracts is indicated; thus, the purchase of March contracts for 200 tons of soybean meal is expressed as "BUY 2 MARCH 1989 SOYBEAN MEAL". The commission houses have special forms for use by clients in placing their orders.

The different types of orders that may be placed are as follows: i) The most common type is a sale or purchase order to be executed immediately at the best possible price at the time. Some clients prefer that their orders be executed at the beginning or the end of the day's session; ii) Another widely used type of order specifies the maximum (or minimum) price limits, as well as the dates on which it may be executed (during a given trading day or over a longer period); iii) Stop orders may be placed either to close a position or to establish one in the market. A sale order of this type is placed at a price below the current market level and is executed if the price of the contract falls to, or below, the stop price. A purchase order of this type is cancelled if the market price reaches or surpasses the stop price. The aim of such orders is to limit the size of possible losses. It is not always possible for the broker to obtain the stop price, and these orders are therefore not guaranteed; iv) A stop-limit order is one which instructs the broker to execute it only at the price set as a limit or at a better one; v) Another type of order, known as an "around order", sets an approximate price and thus gives the floor broker a certain amount of manoeuvering room; vi) Basis orders indicate that the broker is to purchase or sell a certain number of contracts if the price reaches a certain level; vii) It is possible to cancel an order given previously; viii) Purchase and/or sales orders for soybean products known as "conversion spread orders" may be placed in order to set future prices on the same day for both soybeans and soybean products at their prevailing market prices. This type of order also permits price limits to be established; ix) there are many other types of orders that are used less frequently and will therefore not be listed here.

In addition to liquidating their clients' contracts and refunding or collecting their margin deposits, commission houses also supply them with detailed information concerning the markets and market prospects. The main commission houses have teams of analysts who constantly monitor world events in the grain market and in the markets for other assets or currencies that influence it; consequently, participation in futures markets gives clients the possibility of substantially improving their pool of information. While the benefits of access to better market information are not quantifiable, since its possession does not necessarily result in better sales or purchase prices, it can be assumed that Latin American traders could improve their performance in the grain market by analysing and assessing the studies and advice provided by the various commission houses (clients usually deal with a number of different brokers). This would particularly be the case for traders that are not subsidiaries or branches of large multinational firms, since the latter have access to other sources of market information.

IV. UNRESOLVED ISSUES AND CONSTRAINTS IN RESPECT OF THE USE OF UNITED STATES GRAINS EXCHANGES BY THE DEVELOPING COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN

In the preceding chapters mention has been made of various benefits afforded by a correct utilization of United States futures markets on the part of Latin American and Caribbean grain traders. In spite of these benefits, little use is made of them by such traders at the present time. This is due to a number of doubts that stem from a lack of knowledge concerning the operations of these markets as well as to objective limitations that impede their efficient use. These include the questions that arise as to whether prices on the United States exchanges are representative of the basic conditions existing in world grain markets, the limitations that may be associated with their lack of representativeness of local supply and demand conditions in the Latin American countries and those related to price volatility, the barriers erected by the developing countries themselves that hamper efficient trading in these markets, the means by which United States exchanges might limit the access of Latin American firms and institutions, and other restrictions which will be analysed below.

1. How well prices on the United States exchanges represent basic conditions in grain markets: possible sources of market interference

The futures exchanges of the United States provide the physical infrastructure, a body of regulations and the necessary guarantees which permit hundreds of buyers and sellers to trade, grain and other commodities in an open market. The prices which are settled upon in these transactions are recorded for the different contracts (delivery months) and are immediately disseminated throughout the world. Price formation in these markets (which are essentially speculative) is the result of competition between buyers and sellers in the United States and the rest of the world. These traders' perceptions and circumstances generally differ from one another and therefore lead them to form differing expectations as to whether prices will rise or fall, which are then expressed in these markets. Thus, prices are constantly changing as new information comes in concerning specific aspects of the grain market or other markets, or simply because differing expectations are formed on the basis of the same information.

The scale on which the United States futures markets operate is very large. During the past two decades, the growth of world trade in grain and related products has been accompanied by a spectacular increase in the use of futures markets, whose trading volumes now surpass, by a wide margin, total United States supply and, indeed, world production of such commodities (see table 28).

One of the main factors that contributed to the growth of United States futures markets in the 1970s was the use of hedging on the part of grain traders to avoid the risks associated with the sharp price swings experienced during that decade (Peck, 1982), as shown in figure 12. A comparison of total trading volumes on the futures markets with world production or United States supply reveals the great liquidity and speculative nature of these grain markets, particularly as regards soybean products, while the figures indicate that hedging, as measured by the ratio between open interest and production or supply, is of less significance.

However, the essentially speculative nature of these markets does not invalidate their importance as mechanisms for price formation in United States and world trade. As various specialists have pointed our (Caves, 1977-1978; Pierce, 1976), the futures markets which are widely used by the large grain trading firms play an integral and fundamental role in the world grain trade as price formers and disseminators and as instruments for stabilizing prices and hedging risk.

a) Market interdependence. The need for a global analysis

In the modern world, the interdependence of factor, commodity and other markets is becoming ever greater. Any sort of analysis or projection concerning the markets for grains and related products not only must take into account a host of elements related to technical market conditions (including possible interference by participants or their regulations), but also must incorporate an analysis of the fundamental factors of supply and demand at the local level and within the international macroeconomic framework.

One error that is frequently made when attempting to determine the price outlook for a particular product is the failure to take into account the broad economic context in which that product will be competing for scarce resources in the different markets (Kipnis, 1984). Factors as diverse as the economic cycle in the United States and other countries, the parities of the principal countries' currencies (the dollar against the yen and European currencies), changes in the prices of precious metals, financial assets and oil, political problems that may affect the East-West balance, and changes in interest rates and in the supply of credit supply are all events that can radically alter market behaviour. Therefore, it does not seem reasonable to raise the issue of the exchanges' representativeness on the basis of interference from

Table 28

VOLUME TRADED IN FUTURES MARKETS, OPEN INTEREST, WORLD PRODUCTION, AND UNITED STATES SUPPLY, 1978-1980

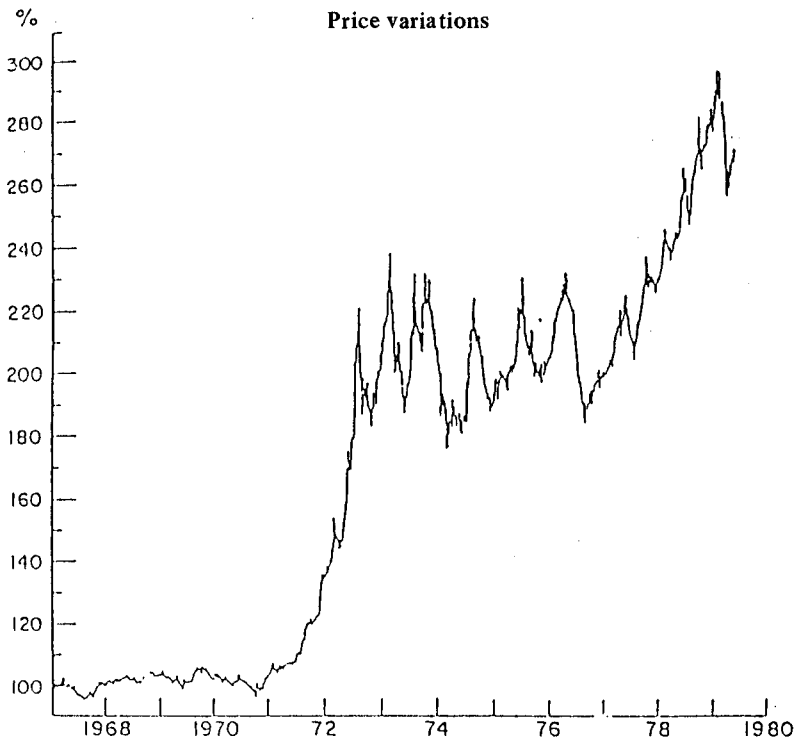
(In physical units)

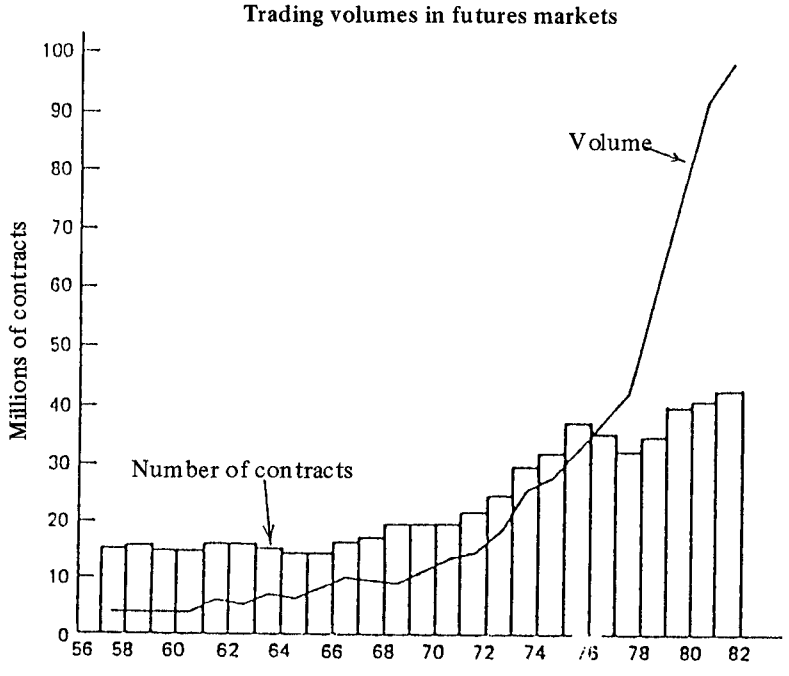
Commodity	Total trading volume	Open interest	World production	Supply in the United States
Soybeans	1 332	16.7	84.0	60.3
Soybean oil	83	1.6	12.5	5.7
Soybean meal	255	4.8	55.7	23.4
Corn	1 132	21.5	400.0	219.2
Wheat	707	10.5	435.6	84.3

Source: Gregory Kipnis, "Macroeconomic factors in the commodity market outlook", Handbook of Futures Markets, Perry J. Kaufman, New York, John Wiley and Sons, Inc., 1984.

Figure 12

INTERNATIONAL PRICE VARIATIONS AND INCREASES IN THE USE OF FUTURES MARKETS





Source: Gregory Kipnis, "Macroeconomic factors in the commodity market outlook", ***Handbook of Futures Markets,*** Perry J. Kaufman, New York, John Wiley and Sons, Inc., 1984.

other financial markets or of alterations arising out of national agricultural policies; on the contrary, the growing interdependence of countries and markets leads to the conclusion that the best course of action would be to identify and quantify the impacts of the countries' policies and of other macroeconomic factors on world supply and demand for grain.

International recognition of these linkages is one of the reasons why the negotiations currently taking place in the Uruguay Round of GATT take into account not only sources of trade distortions (subsidies, access barriers) with respect to agricultural products, which are subjects that have traditionally been dealt with in previous rounds, but also domestic policies related to production, marketing and exchange rates that also distort world trade and prices in the different markets. For this purpose, different instruments have been developed in order to measure, in the aggregate, all the factors of distortion affecting each country, and studies have been done to identify the levels of protection, or lack thereof, provided to agriculture in each one of them.

b) Possible problems arising from participants' behaviour

The literature on futures markets refers to various cases where operational problems have arisen as a consequence of manipulation and other distortions. However, it should be noted that, from the very outset, the exchanges have made a great effort to monitor the markets for the purpose of ensuring that they will function in an orderly and reliable manner. Moreover, provisions for dealing with these problems were long ago incorporated into the United States laws which regulate futures markets; these provisions include precise definitions of those practices that are felt to distort the market, trading regulations governing the activities of brokers, and limits on speculation. A succession of regulatory agencies have been created and their powers have increased as time has passed; at present the CFTC is in charge of government regulation of futures markets in the United States, although there has always been a tendency for the exchanges to be self-regulating and to establish controls of their own. The systematic monitoring by the exchanges and the CFTC of price trends and the position of each firm (in both futures and physicals) is directed towards the early detection and prevention of attempts at manipulation and other prohibited practices, and, consequently, problems of misconduct do not normally arise in the grain futures market. All operations over a certain limit must be reported to the CFTC, which cross-references and adds information to its files on each firm in a daily basis, with the result that monitoring is extremely detailed and precise.

Furthermore, the size and characteristics of the grain markets have helped to avoid distortions. As pointed out in chapter I, only

very seldom has the CFTC (or its predecessors) intervened in the grain futures market and, on one of the more recent occasions when it did so, its intervention was considered to be uncalled for by several specialists (Gray and Peck, 1981).

The foregoing supports the conclusion that the reliability of these markets with respect to possible attempts at manipulation and distortion on the part of participants is relatively high, thanks to their ongoing supervision by the exchanges themselves and official regulatory agencies.

2. Problems as regards the representativeness of United States exchange quotations in terms of local supply and demand conditions in the Latin American and Caribbean countries

One of the main barriers to the utilization of United States futures markets for hedging by Latin American and Caribbean firms, producers, processors and exporters is the lack of parallelism in the price trends of the respective markets. As shown in tables 14, 17, 22, 23 and 24, Chicago and Kansas price movements do not always correlate with those in the FOB or FAS markets of Argentina and Brazil. Changes in the premiums used for defining FOB prices, in margins, in shipping costs and in exchange rates account for such differences.

Changes in the premiums as regards FOB quotations in Argentine and Brazilian ports are the result of a combination of factors, among which are:

a) The fundamental factors that affect supply and demand in these countries may differ from those prevailing in Chicago. Because these countries are competitors, a sale of United States grain often leads to a fall in demand in Argentina or Brazil. In addition, an increase in grain production in Argentina has very little impact at the world level, particularly in the case of wheat and, to a lesser extent, in that of feed grains and soybeans, and therefore may not be reflected in Chicago prices. Soybean production in the southern hemisphere, particularly in Brazil, has become a very important source of supply for world trade in soybean meal during the period from April to September, and in this case the parallelism is therefore greater (variations in premiums are smaller, as some authors have pointed out) (Stenderup, 1986).

In general, any temporary imbalance between supply and demand in Argentina or Brazil gives rise to active local competition between consumers and exporters which is reflected to a much greater extent in local FOB prices than in Chicago. (This is what normally happens in relation to the marketing of grain during the second half of the marketing year; it also occurred in the case of the small 1988/1989 Argentine corn harvest, which sold at premiums

of around 20 points over the May contract, whereas Argentine corn often sells at par.) The cross-seasonality of production in the northern and southern hemispheres also causes variations in premiums.

b) Interference from direct and indirect subsidies instituted by the United States and other developed countries is another factor which contributes to the variability of the basis. The most typical case is that of the Export Enhancement Programme of the United States, which directly subsidizes its FOB export prices and is being widely used in relation to wheat and soybean oil. The use of the subsidy normally leads to a reduction of prices in the southern hemisphere (in order to be able to compete) and, at the same time, to an increase in United States futures prices. Such subsidies are not applied on a permanent or widespread basis by all countries, and the premiums are therefore affected in a random rather than predictable way, thus contributing to uncertainty. Other production and trade subsidies, or barriers, generate export-price distortions in the various countries and have thus traditionally affected income levels of Latin American grain-exporting countries, but the biases they introduce (which are reflected in the premiums) tend to be less random in nature.

c) Local logistical problems differ and are not always reflected in Chicago. For example, a port strike in Brazil may raise Argentine premiums but not be reflected in Chicago, or vice versa.

d) Changes in the costs of transporting grain from different points of origin are also a significant source of premium variation. The beneficial effects of a decrease in freight charges are felt more strongly in Argentina, to a lesser extent in Brazil and still less in the United States.

An even greater lack of parallelism in price trends is found when domestic prices in Brazil or Argentina are compared with quotations in Chicago or Kansas. One of the reasons for this is the frequent changes in shipping costs and margins (changes in the FAS-FOB ratio). These changes may be the result of government policies in the Latin American countries or the behaviour of local markets (extraordinarily large margins or losses) in response to changes in domestic supply and demand conditions, in which the availability of credit has played a central role in recent years (Lamarca, 1988; Regúnaga, 1988).

In Argentina, the domestic purchasing power of some operators (firms with access to international credit) has been substantially altered by the foreign exchange pre-financing regimes that have been in effect during the last three years. This has enabled such firms either to supply Argentine grain more cheaply and thus offer it at FOB prices that are lower than "normal" or to pay higher prices in the domestic market than those normally derived from

prevailing FOB prices. These transfers have not been systematic, and consequently have given rise to differences in premiums or in FAS-FOB ratios. Similar observations can be made as regards certain credit and drawback mechanisms which have been in effect in Brazil in previous years and with respect to changes in export taxes, particularly in Argentina.

In addition, the decrease seen in Argentine production in recent years has resulted in an oversupply of shipping and processing capacity for oilseeds which has sparked sharp competition among grain elevator firms at terminal locations and among processing plants. This situation has been reflected in lower shipping charges and higher domestic grain prices that have altered "normal" FAS-FOB ratios.

Another source of asymmetry between domestic prices in the United States and in Argentina and Brazil is variations in exchange rates (austral/dollar and cruzado/dollar). These have been frequent and sharp in recent years, as shown in tables 15 and 16 in the case of Argentina. Although some of these movements can be anticipated because the policies are of an explicit nature, in some cases adjustments have been unexpected and have significantly altered the domestic purchasing power of exporters or, in other words, the forwarding costs.

The elements described above lead to the following conclusions:

a) In some years variability of premiums is greater than the variability of FOB prices in Latin American ports. This occurs more frequently in the case of Argentine wheat (the reader will recall the earlier discussion of the interference from United States subsidies), less frequently in that of corn and infrequently in the case of soybeans. This means that, in Latin American countries, hedging (on subsequent FOB purchases) cannot be undertaken systematically or indiscriminately, since hedgers must take into account the local conditions prevailing in each year (e.g., the size of the harvest). Moreover, hedges tend to be efficient only on sales corresponding to the period in which exports are concentrated. Subsequent sales, when stocks are very low and the local market is moving in the opposite direction from that of the United States (opposite season), generally cannot be satisfactorily hedged in Chicago.

b) From the standpoint of price formation and pricing, United States futures markets are a useful tool, since premium changes permit the incorporation of variations in local conditions and thus the continued use of basic futures quotations.

c) Hedges on FOB sales by exporters who intend to make delivery FOB (buying the grain FAS) are subject to still greater interference since, in addition to the problems described in

section a) above, they are affected by variations in shipping costs and exchange rates. To a certain extent these are foreseeable, making it possible to "hedge the basis". However, in this case as well there is a need for close monitoring of the relevant variables (such as exchange rate trends, inflation and local conditions), so it is not feasible to think in terms of an automatic use of hedges in Chicago or Kansas.

All of the foregoing points to the need for professional training in futures trading and for ongoing monitoring of international and local events that influence the markets.

3. Price variability. Reactions and overreactions

As mentioned earlier, the world grain trade has shown great dynamism in recent decades. Its rapid growth has been accompanied by frequent imbalances between supply and demand and by marked price changes in relation to the prices of other goods and to different currencies. A high degree of variability and growing difficulties in predicting such variations have been hallmarks of the last few decades.

Price variability affects the incomes of exporting countries as well as the funds invested by consumers; this creates serious economic problems and thus constitutes a permanent source of concern for politicians and economists. Recent price swings have been attributed to various closely interrelated causes: increasing government interference in production decisions and in trade; the internationalization of markets and the associated implications of changes in interest rates, in exchange rates, in prices of other products (oil, precious metals), and in the incomes of the various regions; changes in world trade flows and the greater and more unpredictable dependency of many countries (Soviet Union, China, developing countries) on food imports in order to satisfy their growing needs; poor market performance and the institutional structure associated with world trade; etc.

In regard to the last-mentioned factor, it should be noted that one of the most controversial issues in relation to futures markets concerns the effects of speculation on price variability.

The essentially speculative nature of futures markets has already been discussed in earlier sections. In principle, the objective of speculation is to ensure that the effects of anticipated events will be discounted for in futures prices, which would tend to lead to complete stability; if all influential factors were predictable and if the effects of such factors were fully reflected in futures prices, the result would be prices that would remain at relative equilibrium levels. Consequently, if price fluctuations are a measure of market imperfection, then futures markets must be far from perfect (Hieronymus, 1978).

The controversy surrounding this matter stems from the fact that some authors attribute price variability to speculation, while others contend that the large trading volumes in these markets have a stabilizing influence, and that markets in which speculators do not participate (or do so only on a small scale) exhibit greater price variability. [21] [22]

Although measuring the effects of speculation is conceptually simple (it is a question of determining whether price variation is greater or less than it would be in the absence of these markets), in practice it is difficult, since one cannot simultaneously observe one situation in which there is speculation in a given product and another in which it is absent.

For many years the arguments against speculation carried the day (which was reflected in United States legislation), and speculation was considered to be a necessary evil in order to permit hedging.[23]

From this perspective, speculators generate the short-run overreactions that are typical of these markets at times in response to changes in the "fundamentals" for the products in question, but at other times because of the lack of investors' interest in other markets (shares, bonds, etc.) or vice versa.

The main causes identified in various studies concerning the shortcomings of futures markets are:

a) The participation of poorly informed speculators who follow market trends and who therefore might more properly be described as gamblers rather than speculators.

b) Manipulation and other distortions which tend to create imbalances in market forces (these factors have been studied extensively and increasingly precise regulations and controls have been established to prevent them).

c) The psychological factors which are advanced by those who argue that the speculator increases price variability.

There are also a large number of studies that take a favourable view of speculation. Many of these resulted from research into the negative impacts of unsuccessful speculation or from research that helped to provide a better interpretation of certain phenomena. The clearest example is that of inverted markets, which are less frequent in the case of products for which large trading volumes are recorded in futures markets. Research in this connection led the Economic Research Service of the United States Department of Agriculture to conclude that large trading volumes and the activities of speculators frequently moderate, rather than accentuate, price volatility. The Service has also pointed out that in order to isolate (and measure in quantitative

terms) the effects of speculation from many other factors that influence prices, it would be necessary to have a complete bahavioural model, which is not available.

Hieronymus states that: a) The price level of a product is higher in the presence of active futures markets than in their absence due to the fact that, in the aggregate, speculators go "long" most of the time and hedgers are willing to pay for "insurance" in order to avoid risk (which would be reflected in lower production prices); b) There is empirical evidence of the absence of consistent seasonal variations in the prices of products for which futures markets have been developed (corn and soybeans). At the same time, the principal grains provide a clear example of the effect of speculation on seasonal price behaviour: the establishment of long positions (in hedges) by speculators during the harvest period helps to raise prices at that time and to reduce them during the rest of the marketing cycle (frequently with the result that carrying charges cannot be covered); c) The controversy regarding this matter centres chiefly around the interpretation of shorter-term variations, which many authors contend are due to imbalances that can usually be attributed to speculators; however since short-term variations are not observed in the volume of speculation, which instead tends to exhibit seasonal or inter-seasonal variations, it is not clear that short-term price variations are attributable to speculation. It should be noted that whenever one speculator is buying, another is selling; that for each person who thinks that prices will rise, there is another who thinks that they will decline; and that each speculator who follows the market's lead must find another who is going against the current. Thus, the theory of the self-generation of market volatility is debatable.

In synthesis, it may be affirmed that price variability is related to the frequency with which speculators change their minds about future price trends. However, it is not clear whether prices vary because growing uncertainty concerning production, stocks, consumption and other events leads speculators to change their expectations frequently, or whether it is their participation in the market that causes price variations. In other words, it is not known whether speculators control the market or whether they are controlled by it -perhaps it is a little of both.

The negative repercussions of price variations (at times for producers and at others for consumers) have prompted a search at both the national and international levels for stabilization mechanisms and policies. An analysis of the many different kinds of stabilization schemes that have been implemented in the various countries exceeds the scope of this study, but a brief discussion of a few of the approaches taken to this problem can be included here.

In some cases, such stabilization schemes have emphasized institutional organization. At the national level, these schemes have called for action on the part of specific agencies (grain boards) to implement price, stock and concerted export policies. At the international level, various types of agreements have been tried, including export cartels and the International Wheat Agreement. Some of these schemes have never been implemented, and the economic clauses of the International Wheat Agreement have not been fulfilled, with the result that its effects have been confined, in practice, to the promotion of an exchange of information on grain markets and policies. Nonetheless, it should be noted that this exchange has contributed to a better understanding of these markets and of the policies in effect in each country, even though it has not succeeded in modifying price behaviour.

An alternative approach (which in some countries has been used in combination with the types of schemes described above) has been the implementation of agricultural policies designed to serve as instruments of direct or indirect market regulation. Examples include the policies of this type provided for by agricultural legislation in the United States and the Common Agricultural Policy of the European Economic Community. Some of these measures have had stabilizing effects on world markets (the reserves system in the United States), whereas others have proved to be sources of inter-market interference (the Export Enhancement Programme of the United States, the levies and rebates of the European Economic Community).

The negotiations now underway within the framework of the General Agreement on Tariffs and Trade (GATT) assign much more importance to the avoidance of market distortions than to the reduction of price variations, although there is a certain relationship between the two.

4. Barriers to access and participation by Latin American firms in United States grain exchanges

a) Access to the exchanges

The Argentine and Brazilian firms which export grain and related products participate in United States futures markets to a greater or lesser extent, depending on their policies and circumstances. With the exception of the National Grain Board, the major firms hedge on these markets, either directly or indirectly through their parent companies.

The large multinationals (which account for a substantial share of total exports) tend to maintain consolidated positions in futures markets and therefore generally centralize these operations

in locations outside Argentina and Brazil; many of them are members of the United States grain exchanges and, indeed, of the clearing corporations as well, and thus do not have any problems in gaining access to these institutions.

The major national exporters of these countries usually operate on United States exchanges through local representatives of the commission houses. As explained in the preceding chapter, firms that have strong economic backing have relatively little trouble in gaining access to United States exchanges through the commission houses, and modern communications systems permit them to operate under conditions similar to those of firms in developed countries.

In addition, these firms can either become members or rent seats on the exchanges, since the exchanges are open to firms in other countries [24] (the Australian Wheat Board, Japanese banks and European firms are members). However, this is relatively expensive, due not only to the cost of exchange seats but also to the annual expenditures involved in setting up and operating offices in the United States. These costs are normally greater than the benefits to be derived from membership and would be justified only in the case of firms engaging in a very large annual volume of trading. There are certain less tangible benefits to be gained from membership, such as the possibility of participating in committees, taking part in the formulation and approval of market regulations and other decisions, more direct access to information, etc. However, these advantages do not appear to be great enough to justify the costs associated with membership, since it is easier to obtain access to these markets through brokers.

Access conditions in the case of co-operative firms in Argentina and Brazil are much the same as those described for national firms and, in fact, some of these co-operatives do trade either directly or indirectly in United States futures markets. The fact that they use such markets less than other Argentine firms is accounted for by technical or operational constraints relating to the management of funds and the generation of profits or losses outside the country.

b) Access to institutional control of the exchanges

The private character of United States exchanges, their long tradition of self-regulation and the nature of United States legislation on this subject leads to the conclusion that it would not be feasible for the Latin American and Caribbean governments to attempt to play any institutional role in the management of the exchanges. In any event, the legal statutes in force in the United States and the constant monitoring of these markets for the purpose of preventing abuses which is performed by the public agency in charge of their regulation and control inspire a relatively high degree of confidence in the practices of the grain exchanges.

c) Other barriers imposed by the developing countries

The National Grain Board (JNG) does not hedge on either Argentine or United States futures markets, nor has it ever done so in the past. It does, however, use the information provided by these markets not only for fixing minimum export prices but also in connection with its export activities. In some cases, its external sales have been conducted in terms of premiums over Chicago.

The JNG's failure to hedge in Chicago or Kansas is not a result of problems in gaining access to those markets; on the contrary the commission houses have shown a great deal of interest in having the JNG trade in futures, as other similar agencies are doing (the Australian Wheat Board, CONASUPO of Mexico, etc.). Rather, the JNG refrains from hedging on the exchanges for a variety of political, regulatory and legal reasons. In contrast to the case of Brazil, where for many years the government has been encouraging and creating mechanisms to facilitate offshore operations to complement its foreign trade -thus permitting the establishment of trading companies that are capable of operating in futures markets (e.g., INTERBRAS)- in Argentina official policies have not emphasized such activities and, in fact, for a long time a political consensus in this regard was lacking. In recent years the Government has been trying to organize trading companies, but these intiatives have not yet borne fruit.

Moreover, although the Grain Act permits the JNG to operate internationally,[25] it is not authorized to transfer foreign exchange out of the country or to receive international credits without prior authorization from the Ministry of Economic Affairs or the Central Bank, which in practical terms makes it impossible for the JNG to operate in the exchanges (very swift action is called for in order to meet margin calls) until this problem is solved.

One of the main factors usually mentioned as limiting the use of United States grain exchanges on the part of Latin American firms is the need to transfer funds abroad in order to deposit initial margins and margin calls. The fact that the amount of money that may be required for this purpose cannot be determined in advance -since prices may change- creates great uncertainty for these firms due to the fact that international transfers of the foreign exchange needed to cover margin requirements are controlled and require official authorization. Although at present it is possible to transfer commissions and other funds abroad, from Argentina and from Brazil, this has not always been the case. In Argentina, transfers of funds out of the country have been officially restricted or delayed during many periods in its history, and this has made it necessary to use indirect mechanisms. Until the recent liberalization of the foreign exchange market (April 1989), Argentine firms had to buy external bonds (known as

BONEX), convert them into dollars in Uruguay, and then transfer them abroad.

Two operational difficulties are related to the foreign exchange problem. One of these is the disparity that can arise from the crediting of funds at the net exchange rate applying to exports and the transfer of these funds abroad at the free-market exchange rate. The profits realized by an Argentine firm as a result of an increase in the price of spot grain are received at an exchange rate that is lower than the free-market rate at which funds are transferred abroad, and vice versa. Although, in the long run, it may be assumed that positive and negative hedges will balance out, the results for a particular transaction, and even for each year, may differ notably.

Moreover, tax problems are also encountered in Argentina in connection with these accounts owing to the fact that these types of losses cannot be registered on corporate profit and loss statements.

The above-mentioned problems have prompted some firms to open accounts abroad, outside the scope of Argentine controls, which permits a smoother flow of operations.

The location of the United States grain exchanges and the different qualities of the commodities in question also limit the types of operations that can be carried out by firms of other countries. These factors eliminate the possibility of making or taking delivery on a futures contract when market conditions make this advisable. This limitation would have a considerable impact in terms of the proper operation of the market if United States firms were in the same position, but this is not the case in the grain markets of that country (Gray, 1965).

V. IMPACT OF THE USE OF UNITED STATES GRAIN EXCHANGES ON LATIN AMERICAN AND CARIBBEAN COUNTRIES: CONCLUSIONS

The United States grain exchanges have traditionally played a highly important role in the world grain trade in terms of price formation and dissemination, export transactions and the marketing strategies of firms participating in the grain trade. This has been the case ever since their inception owing to the fact that the United States has been (and continues to be) the largest world exporter of grain and related products. However, the relative importance of the exchanges has grown in the last two decades as a result of changes in world trade flows (the Rotterdam market has been overshadowed as a source of reference prices by the futures and FOB markets of the United States) and because the greater interdependence of factor, product and other financial markets at the world level has contributed to the growing use of United States futures markets, particularly that of Chicago.

The United States grain exchanges provide the physical infrastructure and regulations that permit buyers and sellers all over the world to settle upon prices under competitive conditions. The huge trading volumes of the Chicago futures markets, which are substantially greater than those of the world grain trade, demonstrate the essentially speculative nature of these markets. Quotations are constantly changing, in response to information and expectations concerning the fundamental factors which influence the supply and demand for grain and related products, as well as in regard to the political and macroeconomic framework at the world level. The speculative nature of the grain exchanges does not invalidate their importance as price formation mechanisms for the United States and the other countries involved in the world trade of these commodities and, in fact, they are used on a massive scale by firms in all of these countries. Even in cases where official or semi-public institutions (the Australian and Canadian wheat boards, official import agencies in countries having centrally planned economies, etc.) monopolize the foreign trade of their respective countries, Kansas and Chicago prices are used as a point of reference.

Through the incorporation of speculators, who in the aggregate go "long" most of the time, futures markets have helped to raise grain price levels; in addition, they have helped to smooth out seasonal variations in supply and prices (thereby reducing the

"market prices of storage", which generally do not cover carrying charges). On the other hand, they have also facilitated the immediate incorporation of political and macroeconomic variables at the world level into the formation of grain prices, which has contributed to a high degree of volatility in the short run. The causes of this short-term volatility remain a subject of controversy; it is not clear whether speculators' expectations frequently change in response to uncertainty and new information concerning production, consumption, stocks and other events in factor, commodity and financial markets, or whether their participation in the different markets is the cause of the variations and over-reactions. Whatever the cause may be, the fact remains that world and country markets are becoming increasingly interdependent and that mass communications and the existence of the exchanges are contributing factors in this regard.

The prices set for grain and related products in United States futures contracts are public and are disseminated immediately throughout the world, and this price information serves as a basis for operations in the spot and futures markets of the Latin American and Caribbean countries, as well as making international transactions more transparent. Price quotations in these markets are published by the main economic information media in Argentina and Brazil; however, producers and even traders in these countries do not have a thorough understanding of futures markets and the implications of their use, and it would therefore be advisable to take steps to disseminate more information about these markets.

In Argentina and Brazil the formulation of bids and most export contracts for soybean products are expressed in premiums above (or discounts below) the closest Chicago contracts. This facilitates the operations of processing and export firms and, since it reduces operators' risks, also helps firms in exporting countries to arrange sales over longer terms and to establish more regular supply flows. Argentine sales of corn, sorghum and wheat to more distant delivery points are also usually priced in terms of premiums or discounts in order to reduce the price risk involved.

United States futures markets provide opportunities for the grain producers, processors and traders of Latin American and Caribbean countries to improve their business performance by using the exchanges for the following purposes: a) to determine and select purchase or sale prices; b) to reduce their working capital requirements; c) to facilitate access to financing; d) to arrive at decisions as to the advisability of investing in storage infrastructure and inventories; e) to conclude transactions in which prices are expressed in premiums; f) to hedge; and g) to prepare their budgets (foreign exchange requirements).

The variability of the prices for grain and related products makes it all the more important to hedge grain transactions on the exchanges, given the high correlation between spot grain prices and

futures quotations. The reduction of (total) price risk by limiting it to premium risk through hedging and the use of options, is very important for grain traders, who buy and/or sell large volumes on the basis of very small margins and are therefore highly vulnerable to intertemporal price variations.

However, the lack of parallelism between quotations in United States futures markets and in the domestic and FOB markets of Argentina and Brazil reduces the effectiveness of hedging in the United States and thus limits their usefulness for these countries. Changes in local supply and demand, interference from the direct and indirect grain trade subsidies instituted by the United States, local logistical problems, changes in shipping and loading charges and variations in net export exchange rates (in their dollar parities), as well as other domestic policies, all may give rise to asymmetrical inter-market price trends.

In some cases, especially that of wheat and, to a certain extent, corn in Argentina, intertemporal differences in FOB prices during each marketing cycle in periods prior to the peak shipment period are less marked than the variation in the premiums (the premium risk is greater than the price risk). Oilseed products in Argentina, and particularly in Brazil, exhibit a less sharply skewed price pattern. The problems associated with this phenomenon are even greater in relation to domestic prices.

Although hedging on United States exchanges does not entirely eliminate the risks represented by intertemporal variations in all the components of domestic and international price formation for the grains and related products exported by the Latin American countries, and even though it entails certain additional costs with respect to foreign exchange operations (the costs incurred in the course of the financial transfers required in order to participate in such markets) which United States firms do not incur, hedging is a valuable tool for improving corporate marketing strategies, particularly since the sharp price swings observed over the last two decades (which may well in the future continue) have been a source of serious difficulties and uncertainty for firms that are subject to such changes. To a certain extent the emergence of asymmetries can be detected in advance, and this suggests the need for constant monitoring of all the variables involved so that a given firm may decide under what circumstances it is advisable to hedge, trade in options, engage in arbitrage, etc., thus adding a speculative dimension to the grain marketing activities of firms in these countries.

The lack of systematic studies on these subjects in the Latin American and Caribbean countries constitutes a major constraint; indeed, there is some irony in the fact that the majority of such studies have been conducted in the United States, where there is less trend divergence.

The asymmetry of price trends in United States markets in relation to those of the Latin American and Caribbean markets cannot be entirely eliminated due to the diversity of the relevant variables. Therefore, in addition to an increased utilization of United States exchanges, consideration should be given to the possibility of developing local futures markets. In Argentina (which has more experience in this field) as well as in Brazil, the domestic marketing of grain has not been facilitated by the existence of efficient futures markets. Operations in dollars, in addition to local currency, were authorized in Argentina in April 1988, but the foreign exchange restrictions that were in effect until April 1989 severely limitated the participation of speculators, with the result that these markets have lacked the liquidity required to operate satisfactorily.

In these cases consideration might be given to the establishment of technical assistance programmes designed to determine the scope of action required in order to eliminate such constraints, as well as to financial assistance schemes to help implement programmes for improving the flow of information and the communications infrastructure of these markets.

Short-term variations in premiums (within a period of one month) are very small in both Brazil and Argentina, and therefore in these cases the hedging of FOB sales in United States futures markets is an efficient commercial tool.

The major Argentine and Brazilian exporters do not have difficulty in gaining access to United States exchanges, since they can operate either directly or through the subsidiaries which some commission houses have set up in both countries, and most of these firms meet the requirements usually established by the commission houses. It is not necessary to be an exchange member in order to buy or sell futures, and the costs (commissions) of operating through brokers are relatively low. Brokers commissions vary from US$15 to US$100 per contract (5 000 bushels) according to the size of the client. Levels of US$20 to US$25 are frequent for fairly large firms, and commissions therefore represent an extremely small percentage of the total value of such operations.

The margins required by commission houses may be deposited in the form of bonds and other interest-bearing assets, so no initial cost need be associated with the margins themselves. Furthermore, since futures prices are unbiased estimates of spot prices, the anticipated value of margin deposits is zero, and thus losses and gains can be expected to offset each other (positive and negative margin calls will balance out).

One accounting problem that may arise in connection with spot and futures operations is that the sale of spot grain at a lower price is not registered as a loss (it is an opportunity cost),

whereas losses in futures markets are shown as such in a firm's accounts.

One of the barriers to an increased utilization of United States futures markets is the need to have funds available abroad (or to be able to draw on funds immediately) in order to deposit initial margins and margin calls. For quite some time now the official and private use of futures markets in third countries has been encouraged in Brazil.

The same has not been true in Argentina, where for many years, until April 1989, transfers of foreign exchange were officially controlled, restricted and otherwise obstructed. Some alternative mechanisms (of varying degrees of legality) have been used to facilitate foreign exchange transfers or the opening of accounts abroad, but the tax laws and foreign exchange regulations have not contributed to a free flow of operations in respect of such markets.

This has had a particular impact on the National Grain Board and on smaller firms (producers, grain brokers, cooperatives and some exporters), which have not been able to operate in these futures markets, with the result that the various types of participants have had unequal access to different trading instruments. This, in turn, has had negative repercussions on the performance of Argentine grain markets. In fact, the poorly developed nature of local futures markets, the difficulties encountered by traders in the domestic market in gaining access to United States markets, and the problems associated with the disparity that exists as regards access and the costs of financing production and marketing activities have all contributed to the poor performance of the grain market in recent years. This has been reflected in lower export prices -particularly for wheat- (i.e., in an increase in price discounts in comparison with those obtained by competitor-countries) and in lower domestic prices coupled with marked seasonal fluctuations, to the detriment of producers (in particular, the smaller ones).

The fact that the usual practice in the world grain trade is to base prices on those quoted in United States futures markets means that, regardless of the problems that may arise from their lack of representativeness of world supply and demand for grain and from their volatility and over-reactions, the failure of some institutions in Latin American countries to use these exchanges constitutes a disadvantage in terms of their commercial performance, and it therefore would seem reasonable to take steps to remove the existing barriers in order to encourage a greater use of such markets.

An active foreign sales policy on the part of the National Grain Board would clearly be furthered by the use of United States futures markets. Anticipatory sales would permit the JNG to select

the optimum time for sales, and hedging would help it to reduce the price risk that it customarily assumes. However, in order to undertake such operations, the Board would have to receive authorization from the Central Bank in order to open an account and maintain deposits abroad, and this has generally been discouraged because of the country's shortage of foreign exchange.

An alternative would be to negotiate international financing for this purpose, which seems to be a more acceptable mechanism. An international lending agency (World Bank, IDB) could help to set up a fund of this type; these funds would then be deposited (invested) in the United States so that the JNG could draw upon it in order to cover initial margins and margin calls.

This course of action would have to be coupled with the implementation of regulations and mechanisms specifically designed to facilitate the use of United States futures markets. Among other aspects, these instruments would need to ensure that foreign exchange could be freely transferred for this purpose in much the same was as transfers are made to pay commissions or transport charges and would need to modify fiscal provisions in order to explicitly incorporate profits and losses corresponding to futures market operations.

Greater knowledge about and use of United States futures markets could also yield benefits in terms of the imports of the Latin American and Caribbean countries, in view of the fact that the United States is the major exporter to the region and futures quotations are used as reference prices for many import transactions. The balance of benefits versus costs as regards imports is, at least in theory, more favourable than it is in the case of exports due to the fact that asymmetries between the domestic prices of Latin American and Caribbean importing countries and United States futures market quotations have less influence on the results of import operations. The institutional structure of imports in many countries of the region –those where the government plays an important role in this sphere– facilitates the management of such asymmetries; however, the restrictions to which such purchasing agencies are often subject as regards both the acquisition of foreign exchange and their efficient participation in foreign markets constitute weaknesses and barriers of considerable importance.

VI. RECOMMENDATIONS AND POLICY OPTIONS

1. Utilization of the United States grains exchanges by developing countries

As explained in chapter V, the United States grain exchanges are used by the Latin American and Caribbean exporting countries mainly as sources of information and reference prices and for hedging. Their utilization is advantageous despite the fact that the markets of these countries are subject to limitations of an economic nature which mitigate against efficient hedging (asymmetrical price trends) and that there are barriers –especially in Argentina– to a smooth flow of operations on such exchanges. The different types of agents or institutions connected with the grain trade are affected in different ways by these problems, and this introduces biases which adversely offset market performance.

In view of the benefits of a more uniform and more transparent use of the exchanges by all market participants, efforts should be made to:

a) Promote a fuller understanding of their uses by means of a technical assistance programme.

b) Eliminate existing impediments to their efficient operation, particularly in Argentina, by expressly authorizing and facilitating the foreign exchange transfers required in order to trade in these markets.

c) Arrange for international financing (IDB, IBRD, etc.) in order to set up funds for the deposit of initial margins and margin calls.

Similar considerations apply to the eventual use of United States futures markets by importing countries. Although this issue has not been specifically addressed in this document, a greater knowledge and use of these markets would also be beneficial for this group of countries.

2. Strengthening of local markets

The asymmetrical nature of price trends in the domestic markets of the Latin American countries in relation to quotations in Chicago and Kansas, as well as other problems that hamper the successful domestic marketing of grain (such as the concentration of supply during one season of the year, financing difficulties, decision-making problems as regards investment and stock maintenance) point to the necessity of strengthening local futures markets in Argentina or of developing them in Brazil. As indicated by studies on Argentina (Lamarca, 1988; Regúnaga, 1988) domestic grain marketing problems not only result in lower incomes for producers but also are often the cause of excessive discounts in FOB export prices. Improving the way in which local futures markets function would be one means of improving the performance of the Argentine marketing system.

At present, Argentine futures markets are used very little by traders and even less so by speculators. Trading volumes are very small (both in absolute terms and in terms of production) in these markets and their liquidity is very limited, making them unreliable and unattractive to operators. This has been attributed to various factors: a) inflation, particularly in terms of the financial problems it causes with respect to margin deposits and to the projection of future prices under highly variable conditions; b) political and institutional factors deriving from the unpredictable, discretionary and, at times, arbitrary nature of government intervention in the market, which has interfered with its normal development; c) cultural factors associated with the critical view that has prevailed in the country concerning the activities of speculators; d) a lack of knowledge on the part of many traders as to the advantages of using futures markets and the lack of studies on the operations of these markets, their use for efficient hedging and their other functions; and e) the high risk of manipulation and other distortions created by their low liquidity and small trading volumes.

The recent authorization of dollar-denominated trading has improved some aspects, but thus far trading volumes have remained very small owing to the continued existence of some of the limitations discussed previously. It is therefore considered advisable that a detailed review be made of the problems inherent to these markets (margin requirements and margin call systems, number of positions and delivery points, number of markets (in dollars and in local currency), access of new participants, computerized processing and dissemination of information concerning quotations, open interest, monitoring of operators, etc.) and those problems associated with the political-institutional framework (limitations on foreign exchange operations at the free-market rate, possible government interference, institutional controls, etc.) with a view to implementing the required changes.

3. Other alternatives for increasing the Latin American and Caribbean countries' export prices for grain and related products

An increase in the value of the developing countries' grain exports could be achieved through various types of action at both the international and the domestic levels. At the international level, steps could be taken towards improving market access and promoting a reduction in subsidies and other distortions in world trade. At the domestic level, action could be taken to modernize the relevant institutions and to improve various auxiliary aspects, such as market information and financing.

a) Action at the international level

Multilateral activities. The incorporation of the subject of agriculture into the GATT negotiations has provided an opportunity for advancing the cause of the liberalization of world trade. The present moment is an appropriate one for the Latin American grain-exporting countries to exert as much political pressure as possible to move forward on some of these issues. In this regard, joint action with the Cairns Group constitutes a more effective option than isolated efforts on the part of individual countries.

Other multilateral initiatives such as international grain agreements containing economic clauses aimed at price stabilization (e.g., the International Wheat Agreement) have been difficult to implement and have failed to achieve their objectives. It should be noted that this type of agreement is not accepted by the United States, whose leadership in matters of protection and marketing at the world level is a decisive factor.

Bilateral activities. The fact that there is little prospect of achieving positive results in multilateral forums in the short run suggests the advisability of establishing mechanisms for cooperation at the bilateral level between exporting countries as well as with importing countries. The potential for mutually beneficial action is greater at this level, particularly in the case of countries in the region. In this regard, political and economic integration agreements between Latin American countries (such as those existing between Argentina and Brazil and between Argentina and Uruguay) have proved to be useful means of facilitating grain sales for exporting countries and guaranteeing supplies at competitive prices for importing countries which permit them to take advantage of the favourable circumstances which exist in terms of location, reciprocal trade and the political will of these countries to cooperate with one another.

In general, long-term supply agreements facilitate the annual marketing of the harvest for exporting countries in that they reduce the proportion of stocks for which no prior export

commitment has been made, and efforts to place grain in third markets can thus be concentrated in fewer countries. This is true so long as the agreements provide for clear-cut mechanisms for the transmission of information and for consultations and provided that the agreements are scrupulously fulfilled (some countries, for example China and lately the USSR, have not abided by their agreements and have thus introduced uncertainty into the market whose harmful effects are at times not offset by the above-mentioned benefits.

In order to gain access to national markets that have differing requirements (in terms of competitive prices, credit, quality, technical assistance, etc.), baseline analyses and monitoring of each of the main markets need to be carried out by the agencies responsible for promoting and conducting trade on behalf of developing countries. As pointed out in various earlier studies on intraregional trade, one of the problems hindering the expansion of such trade is the lack of systems for providing adequate information about the requirements, supply capabilities and import and export regulations of each country. The same lack affects trade with developing countries of other regions as well.

b) Other action at the national level

Due to the differing characteristics and circumstances of the individual Latin American exporting countries, a detailed analysis of this subject on a country-by-country basis lies beyond the scope of the present document. Therefore, only a few general elements will be mentioned here; some of the major needs in this sphere are the following: the modernization and strengthening of public and private institutions connected with the grain trade (the National Grain Board of Argentina and similar agencies in other Latin American countries, the grain exchanges, agricultural cooperatives, etc.); the improvement of financing mechanisms for domestic and external marketing (credit for these purposes has been limited and has become notably more expensive in recent years, which has resulted in the seasonal concentration of sales and in a drop in export prices during peak supply periods); an increase in the capacity and efficiency of trade infrastructure (grain elevators, ports, etc.); and the improvement of information systems relating to supply, demand and prices in each of the countries.

The economic and external-sector crises being experienced by the countries of the region are facing, have led to a reduction of government budgetary allocations for the above-mentioned activities and institutions, which have had a detrimental effect on the efficiency of the countries' marketing systems. In view of the importance of grain as a source of foreign exchange for some of the Latin American and Caribbean countries, and bearing in mind their present budgetary constraints, consideration should be given to the possibility of arranging for the provision of technical and credit

assistance by the appropriate international institutions on the understanding that an improvement in the performance of the commercial systems, of these countries would help to increase the value of their exports.

Notes

[1] The medieval fairs of Champagne, France, were famous and were the most highly developed markets in terms of trading standards and regulations.

[2] Each buyer or seller of a futures contract most conduct the transaction through a member of the exchange (broker). At the end of each day, the broker must clear all his clients' purchases and sales through a member of the clearing house (if he himself is not a member of that institution). Thus, regardless of what transpires between a client and an exchange member, the reliability of the system is based on the reputation and economic backing of the members of the clearing house, who are responsible for the fulfilment of the contracts.

[3] Examples include the studies carried out by various government agencies in the United States (the United States Industrial Commission 1900-1901), the United States Federal Trade Commission (1920-1926) which provided evidence concerning the performance of these markets.

[4] At present these bonds are the most actively traded contracts in the world.

[5] These margins are different from those that brokers require of their clients.

[6] When discrepancies arise in the information furnished by different brokers (due to errors of interpretation or because only one of the brokers that was party to a transaction provided the relevant information), unless the dispute is resolved on the spot, the transaction in question is not cleared on that day and the brokers are asked to resolve the issue prior to or upon the opening of the following day's trading session, with the result that the contract is cleared one day late.

[7] It should be noted that the aim is to avoid manipulation rather than market movements attributable to market factors relating to the supply and demand for the commodity in question or to other commodities, goods and currencies.

[8] In Japan a CIF market has been developed but is not used as an indicator for other countries.

[9] Direct and indirect subsidies instituted by the United States and the European Economic Community for foreign trade in grain and related products have not substantially modified this situation, since they are either incorporated or taken into account in the FOB price. At European ports, FOB prices already incorporate the rebates provided to EEC exporters and, in the case of the United States Export Enhancement Programme subsidies, authorized amounts are deducted from the FOB price.

[10] It should be noted that only firms which trade in physicals operate in these markets. However, this does not mean that they do not speculate or take long or short positions in these markets, especially in Argentina or Brazil, where the limited development of hard-currency futures markets has helped to encourage these types of operations.

[11] Procedures for fixing the price may vary from one contract to another; a frequent practice is to give the buyer the option of setting the date on which the price will be established.

[12] The list of commodities for which the JNG sets index prices and/or FOB minimums is very long, starting with the main grains (corn, wheat, soybeans, etc.) and ending with some grains of lesser importance (alpist, millet, haricot, etc.) which are not quoted in United States futures markets and for which the procedures therefore vary depending on the product.

[13] In 1920 they handled 21 100 tons whereas in 1987 their volume was only 1 850 tons, according to a recent study by the Inter-American Institute of Agricultural Sciencies (IICA) entitled "Mercado de cereales a término, propuestas para su adecuación" (Macera, José, June 1987, Buenos Aires).

[14] It should be noted that, for the sake of conceptual clarity, a simplified formula is given here which does not incorporate other variables that also affect the purchasing power of exporters in the domestic market (such as the financial management of resources derived from foreign exchange pre-financing arrangements, under-invoicing, the local activity of the edible oils industry, whose purchasing power also incorporates manufacturing costs, etc.), but that do not change the basic line of reasoning with respect to the exchange rate.

[15] A more detailed analysis of these alternatives has been presented in the first section.

[16] Mainly in the case of wheat exports.

[17] This is the case of second-level cooperatives and some private firms in Argentina and especially in Brazil.

[18] Sales to Iran, Mexico, China, India and Brazil, among others, generally involve large volumes.

[19] The trade-offs in this case are that the sale of futures does not eliminate the basis risk and poses practical difficulties for small producers because of the standardization of the contracts (minimum volumes) and owing to margin and deposit requirements.

[20] Some export firms in Argentina and Brazil are branches of firms that are members of United States exchanges. The Australian Wheat Board decided to buy a seat. In general, however, the cost of exchange seats is very high in relation to the benefits that firms in other countries may obtain from them.

[21] By way of illustration, it can be pointed out that the last International Congress of Agricultural Economists, held in Buenos Aires in 1988, dealt with the question of "Agriculture and governments in an interdependent world".

[22] Gray and Rutledge (1971) made an extensive and detailed survey of the literature in order to examine the historical evidence on price fluctuations.

[23] It should be recalled that market liquidity is provided mainly by speculators and that one of the reasons for the failure or poor performance of such markets is a lack of liquidity (Gray, 1965; Marsana, 1988).

[24] The only Latin American country that does not have access to the Chicago exchange is Cuba.

[25] The Grain Act is a very broad piece of legislation, in that it creates a trade fund that is independent of the administrative budget and authorizes it "in carrying out such trade, to engage in any type of cash or term operations...".

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