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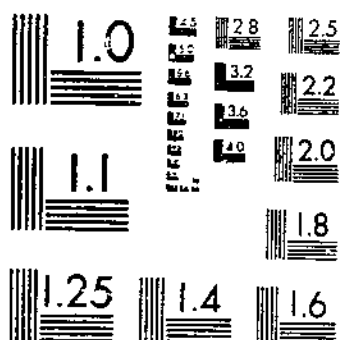
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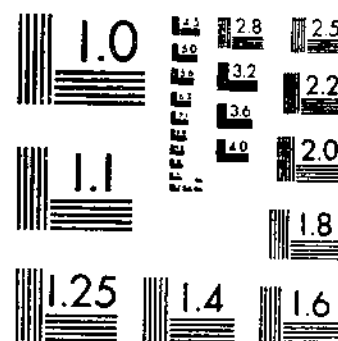
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GRAIN PRICES AND THE FUTURES MARKET: A 15-YEAR SURVEY, 1923-1938  
HOFFMAN, G. W. DUYEE, J. H. T. 1 OF 1

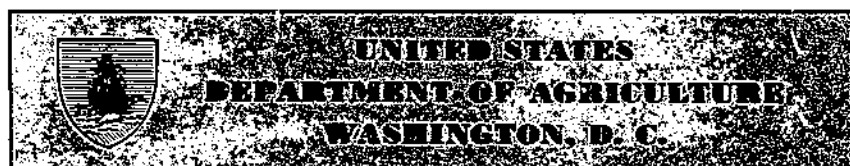
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# Grain Prices and the Futures Market: A 15-year Survey, 1923-1938

By G. WRIGHT HOFFMAN, *consulting economist*, with a foreword by J. W. T. DUVEL,  
*Associate Chief, Commodity Exchange Administration*

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## FOREWORD

The Grain Futures Act became a law on September 21, 1922. Due, however, to a temporary stay of execution in which its constitutionality was tested before the United States Supreme Court, the law did not go into operation until the following year. On June 22, 1923, regulations under the act were promulgated by the Secretary of Agriculture and shortly thereafter systematic supervision of exchanges by the Grain Futures Administration began.

In the decade and a half since the law became effective a substantial body of facts has been acquired regarding futures markets. Regular daily reports, together with special investigations, have served to

broaden materially the understanding of enforcement officers, exchange members, and the public regarding the place of futures trading in the marketing of grain. A detailed technical knowledge of trading and accounting practices has been built up. Trading practices were found to range the whole way from efficient and straightforward methods to careless and irregular ones. This discovery has emphasized the necessity of selective regulation and supervision if desirable market practice is not to be destroyed with the undesirable.

It became increasingly evident, however, that selective regulation was not possible without substantial amendment of the act. In some instances minor infractions could not be reached except by penalizing the entire exchange. In other cases major offenses could not be prosecuted unless the prosecution was undertaken while the offense was being committed. Other areas needed improvement but were not covered by the act. These deficiencies were met in 1936 by the passage of legislation amending the statute in the light of the Department's 13 years' experience and extending its provisions to cotton, butter, eggs, potatoes, millfeeds, and rice. The Grain Futures Act as thus amended became the Commodity Exchange Act.

The enactment of these amendments marked the close of one important chapter of grain exchange regulation and the beginning of another. In view of this fact, it was thought advisable to make an appraisal of the more important developments during this period for the value it can have in guiding future effort. Dr. Hoffman was selected to make this study, the results of which are set forth in this bulletin. His work with the Grain Futures Administration (dating back to 1924) and more recently with the Commodity Exchange Administration, has given him a wide and valuable experience upon which to draw. He has made free use of the investigations of others during this period, including reports, hearings, court cases, and regulations of the Administration.

From these sources an attempt has been made to show how the presence of futures trading "improves, modifies, or detracts from the fundamentally competitive status of grain markets." The problem is obviously a difficult one. How modern grain markets would operate in the absence of futures trading can only be estimated indirectly. Furthermore, were this fully known, permitting the net effect of futures trading to be measured, the problems would still remain of determining, classifying, and weighing the various trading elements which produce this net effect. A realistic view of the matter suggests a marshalling of those aspects of futures trading about which worthwhile conclusions can now be drawn with the full knowledge that these may have to be modified later and most certainly added to as additional facts are acquired. This plan has been followed in the present study.

Throughout the report the point of view of trader psychology has been stressed. Prices move as a result of bids and offers. Bids and offers are made by those who are willing to trade. Back of willingness to trade are the opinions and purchasing power of traders. It is at this last level that facts are needed. While it is possible to obtain some knowledge of the financial capacity of those in the market at any given time, their numbers vary as well as their fortunes. Still more elusive is the body of market opinion at any given time, or from time to time.

There is ample evidence that many traders base their opinions upon such fundamental facts as supplies, their location and movement, domestic and foreign demand, and general business conditions. Objective evidence of this is to be found in the fact that prices change broadly as these fundamental facts change. This aspect of trader opinion is presented in the second section of this survey. But there is also ample evidence that many traders base their opinions upon matters far less fundamental than the supplies and movements of grain or the demand for grain. These aspects of trader opinion are presented in later sections of the report.

Present-day regulation of commodity exchanges can be understood only through a knowledge of methods and effects of actual trading. The present study should be helpful in supplying such a background.

J. W. T. DUVEL, *Associate Chief.*

## POST-WAR GRAIN PRICES

On January 28, 1925, the price of wheat at Chicago reached a high of approximately \$2 per bushel. In November 1932 it was slightly above 40 cents per bushel. This is a decline of approximately \$1.60 per bushel or 80 percent. During this same period corn also declined 80 percent, moving from a high in excess of \$1.30 to a low of 25 cents. Oats made a similar decline of over 75 percent, moving downward from 60 cents per bushel to a low of 15 cents.

Fluctuations of these proportions suggest at once the extremely uncertain character of grain prices. To a large extent these declines were occasioned by changes in the supplies of grain and by the general lowering of all-commodity prices after 1929; in part they were due to widespread trade barriers; to some extent they were due to forces generated in the market itself.

### WIDE VARIATIONS IN GRAIN PRICES

In addition to this broad downward swing, post-war grain prices are characterized by other pronounced movements. Wheat prices declined from a high in late February 1922 of \$1.50 to a low in July

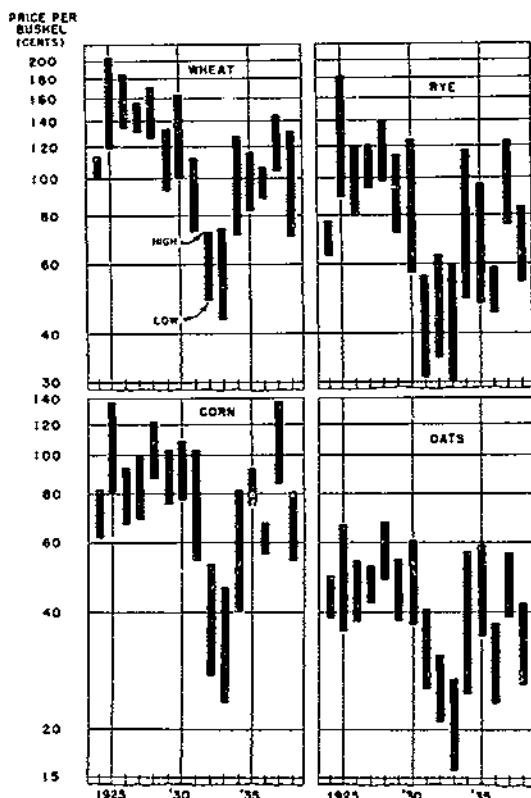


FIGURE 1.—The high, low, and range in price of each May future for four grains, Chicago Board of Trade, for the futures ending 1924-38.

1923 of less than \$1. They advanced from a low in March 1924 of \$1 to a high in January 1925 of \$2 per bushel. After November 1932 prices advanced again from 45 cents to a high in July 1933 above \$1.20 to recede below 70 cents in October 1933.

Within these broader movements many smaller but important swings also have occurred. In figure 1 are shown yearly ranges of the May future for each of four grains at Chicago 1924-38. Figure 1 is drawn on a ratio scale to give to each range an importance commensurate with the level of prices at which it prevailed.

That grain futures prices, and in turn grain prices, have experienced wide variations during these post-war years is clearly evident.<sup>1</sup> The annual ranges of the May wheat futures average for this period 42 cents with several seasons above 50 cents per bushel. A simple measure of the variability of grain prices for each of these years can be obtained by dividing each range by the average of the high and low prices which determine the range. Thus for wheat for the 1924 May future, the range was 14½ cents while the average of the high and low prices was \$1.07½. Dividing the latter into the former yields a variability of 13.4 percent for this future. Similar calculations for each future and grain are shown in table 1.

TABLE 1.—Percentage variations in grain futures prices, Chicago Board of Trade, 1924-38

Year <sup>1</sup>	Wheat	Corn	Oats	Rye	Average
1924	13.4	27.3	21.5	20.8	21.5
1925	53.0	52.5	50.5	68.8	58.7
1926	31.8	34.2	34.8	40.4	35.3
1927	18.1	36.2	21.8	24.0	25.2
1928	30.0	32.9	33.9	35.0	33.0
1929	35.6	32.0	35.3	45.7	37.2
1930	48.5	34.6	43.0	75.1	51.6
1931	43.9	63.1	45.1	58.0	52.5
1932	36.8	63.0	39.4	59.2	60.4
1933	53.1	65.2	52.2	55.2	59.1
1934	56.7	66.0	79.4	81.7	71.7
1935	34.4	21.7	51.9	67.4	43.8
1936	18.5	18.8	46.9	26.9	27.8
1937	32.8	46.6	36.8	43.7	39.9
1938	60.3	38.7	47.6	43.5	47.5
15-year average	38.0	42.4	43.9	50.5	43.7

<sup>1</sup> Future for May of each year.

In proportion to its own level of prices, rye has shown the widest variations during the past 15 years. This higher average is accounted for by the unusual variations in this grain in the 1930-34 futures. Corn and oats have varied a little more relatively than wheat. All four grains show a measure of variation of about 40 percent of their average price level.

A somewhat closer picture of grain prices during this 15-year period is shown in figure 2. Here the quarterly ranges of cash prices (Chicago) for wheat, corn, and oats are shown. They reveal, as does figure 1, a succession of wide movements in price. In addition, many intermediate variations of substantial proportions are shown. With respect to the producers and merchandisers of grain, these intermediate price swings may be of equal if not greater importance than the

<sup>1</sup> It is assumed at this point that grain prices and grain futures prices approximately parallel each other. For evidence, see figures 12 and 13.



PRICE PER  
BUSHEL  
(CENTS)

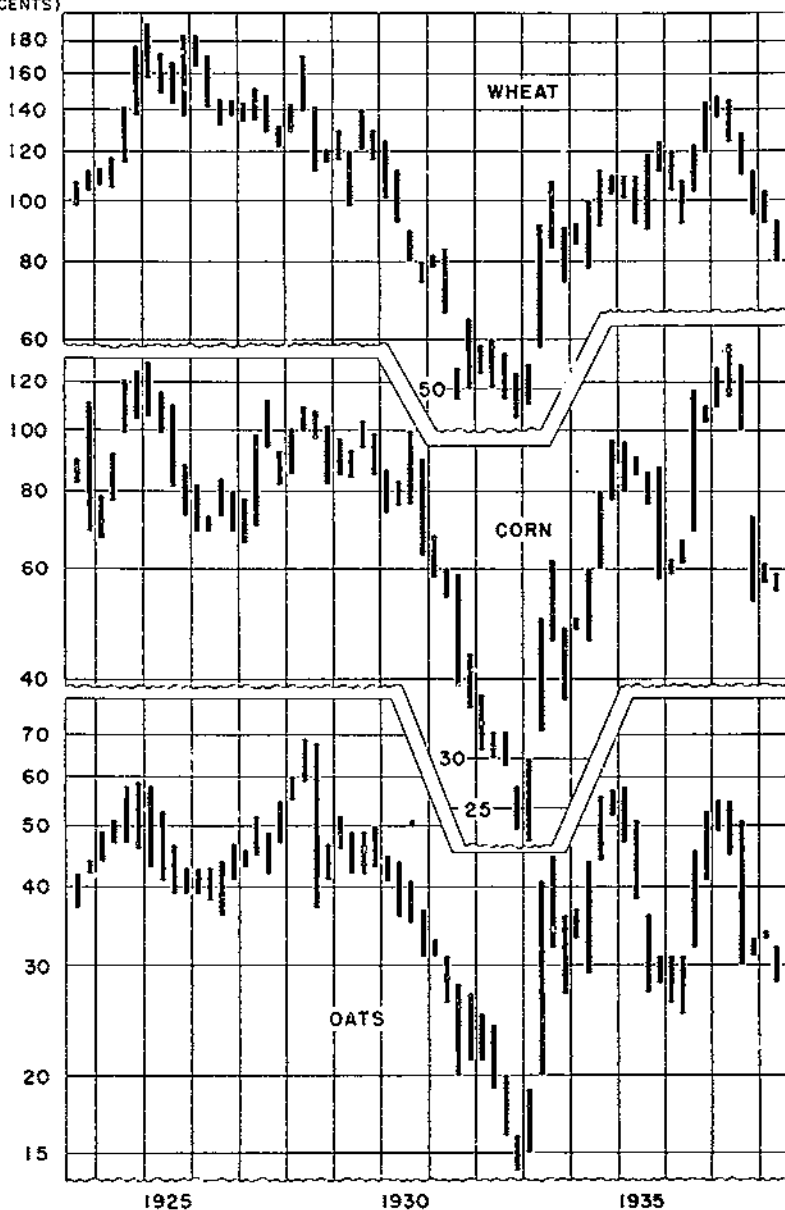


FIGURE 2.—Quarterly range of cash grain prices, Chicago, for the 15-year period July 1923 to June 1938.

longer trends. They frequently determine whether the year's effort shall result in a profit or a loss; they reflect the character and extent of the internal and export movement of grain and determine the direction of effort for the coming crop year.

While the average price variations for these three grains over a period of years is fairly uniform there are periods when one grain may get considerably out of line with another. At such times there occurs a considerable shifting in relative demand and consumption. Thus with respect to wheat and corn prices, the latter have averaged since 1923 about 70 percent of the former. But during the first half of the year 1926 the prevailing price of corn was less than 50 percent that of wheat, and in the latter part of 1930 it rose above 100 percent.

#### PURPOSE OF THIS BULLETIN

It is with these price movements, large as well as intermediate, that this bulletin is concerned. Price is both the steam gage and the governor of the grain-marketing machine. As the steam gage, it measures the net effect of all the forces, natural and artificial, which enter into the supply of and the demand for grain. As the governor, it determines to a large extent the tempo of market activity. It is the purpose of this bulletin to analyze the more important forces which have affected the course of post-war grain prices.

Particular attention will be given to the years following 1923 during which time the Grain Futures Administration (since 1936 the Commodity Exchange Administration) has compiled a sizeable body of facts regarding many phases of purely market activity. As now operated, grain futures exchanges serve as focal points for the accumulation and reflection of a large body of opinion regarding prices. While some of this opinion is based upon a well-founded knowledge of grain conditions, much of it is self-generated as a part of the process of trading and as such is capable at times of creating considerable price instability. It is with respect to these internal market forces that the Commodity Exchange Administration is primarily concerned, and for that reason major emphasis will be placed upon these in this survey. To the extent that they are controlled or eliminated, a correspondingly larger place is given to the more fundamental determinants of price.

#### EMPHASIS ON WHEAT

In this survey of grain prices principal attention will be given to wheat. This is for the reason that in receipts at leading primary markets, in commercial stocks in store, in exports and in volume of futures trading, wheat leads all other grains. This fact is shown in table 2 where a 15-year average of each of these items is shown for the five principal grains. While corn is the most important grain grown in the United States judged by production or farm value, it is fed largely on farms and for this reason ranks second to wheat in commercial importance. Considerable attention will be given to it and especially for periods of unusual price or trading activity. For the same reason but to a lesser extent the more important periods of commercial and speculative interest in oats and rye will be considered.

#### EMPHASIS ON CHICAGO MARKET

Similarly because of its relative importance the Chicago Board of Trade should be given primary emphasis. While Chicago does not handle as large a volume of wheat each year as does Minneapolis

or Kansas City, it has long been and continues to be the outstanding center for those forces which determine the price of wheat. To the extent that this price-making feature is the heart of the market, Chicago is the leading wheat market of the United States. For the same reason it is the leading corn, oats, and rye market. It is not, however, the leading barley market, being second to Minneapolis as a price-determining center.

TABLE 2.—*Relative commercial importance of five grains, average for the 15-year period, July 1923 to June 1938*

[In million bushels, i. e., 100,000 omitted]

Grain	Receipts at leading primary markets	Average commercial stocks in store	Net exports	Volume of futures trading
Wheat.....	356	103	100	11,965
Corn.....	228	22	17	4,194
Oats.....	132	27	8	1,095
Rye.....	22	10	9	490
Barley.....	56	9	18	57

In table 3 are shown the average volume of trading and open contracts in futures upon the three principal grain markets of the United States for the 15-year period, July 1923 to June 1938. With respect to wheat, corn, oats, and rye, the Chicago market stands far above either Minneapolis or Kansas City. For wheat the volume of trading has averaged 88.7 percent of all three markets over this 15-year period against 5.8 percent for Minneapolis and 5.5 percent for Kansas City. In open contracts (being the amount of futures carried forward from day to day) Chicago similarly greatly exceeds its nearest rivals in all grains except barley which is relatively unimportant.

While leadership in futures trading is not conclusive proof of leadership in the price structure, it is important evidence and at least warrants major emphasis on the Chicago market. Additional evidence on the dominant position of Chicago in the price structure will appear at later points in this survey.

TABLE 3.—*Average daily volume of trading and open contracts, all futures combined, for three markets, for the 15-year period, July 1923 to June 1938*

[In million bushels, i. e., 100,000 omitted]

Grain	Chicago Board of Trade		Minneapolis Chamber of Commerce		Kansas City Board of Trade	
	Volume	Open contracts <sup>1</sup>	Volume	Open contracts <sup>1</sup>	Volume	Open contracts <sup>1</sup>
Wheat.....	33.8	113.4	2.2	17.4	2.1	17.9
Corn.....	13.0	58.0	(?)	(?)	0.6	4.0
Oats.....	3.2	35.0	0.4	6.2	(?)	0.1
Rye.....	1.3	12.1	0.2	2.5	.....	.....
Barley.....	(?)	0.3	0.2	1.4	.....	.....

<sup>1</sup> A average of contracts open at the close of trading on the last day of each month.

<sup>2</sup> Less than 0.1.

## THE CASH SITUATION

There are at least three important schools of thought regarding the forces determining grain prices. The simplest of these is the one that believes that grain prices are largely a product of professional gamblers operating on boards of trade. As these gamblers decide, so prices are determined. A corollary of this central theme is the thought that as a rule these professionals would rather see prices decline than advance. Reasoning from these premises, the belief is advanced that since these traders neither produce nor merchandise grain their control over prices is unduly large and should be prohibited or at least restricted.

To orthodox students of economic theory, and especially those specializing in problems of price, the simplicity of this professional gambler thesis is its most obvious weakness. They assert that grain prices have never been so simply determined, at least for any length of time. To prove this statement they point to changing weather conditions, changes in general economic conditions affecting the level of all prices, changes in exports and imports, important forces over which professional traders could have no substantial control. Further study of these underlying conditions has led to the belief that they are the real determinants of grain prices, and that the traders on organized exchanges are little more than mere mouthpieces announcing the facts as they unfold.

In more recent years, and particularly since the Grain Futures Administration has made available additional facts regarding the part played by futures trading in determining prices, there has developed a third school of thought which holds that grain prices reflect not only the forces originating in the production and merchandising of grain, but also those generated in the process of market trading.

This school holds that while a long-run average of prices will conform fairly closely to fundamental trade facts, there is no assurance at any given time that this will be the case due to the uncertain nature of purely market operations.

The studies of the Grain Futures Administration, a cross-section of which is included in this bulletin, indicate that this third school of thought describes more nearly the present price structure for grain than either of the other two schools. For any given season, or at any given time within that season, fundamental trade factors may warrant a price of \$1 per bushel for wheat. Actually the price may be, and for some time may continue to be, as high as, say, \$1.15 or as low as 85 cents involving a possible price range of 30 percent. In a season of unusual speculative initiative these deviations of possible prices may mount to even greater proportions.

It is extremely difficult to measure with accuracy the relative importance of underlying trade facts as price determinants; because of this fact, it is equally difficult to measure precisely the importance of those forces which are generated largely within the market. Some of the former, important during the past decade, are presented in this section with such evaluation of their importance as appears justified; some of the latter will be presented in later sections.

## INFLUENCE OF THE GENERAL PRICE LEVEL

A factor of fundamental importance to grain prices is the changing level of all-commodity prices. This factor has been especially important since 1929. During the 4-year period March 1929 to March 1933, the general level of prices declined about 38 percent; during the 4-year period March 1933 to March 1937, over 70 percent of this decline was recovered. Over these same years grain prices also declined and advanced, though to a considerably greater extent than the broad average of all-commodity prices.

These facts are set forth in figure 3 where the courses of prices for wheat, corn, and oats are compared with the trend in all-commodity

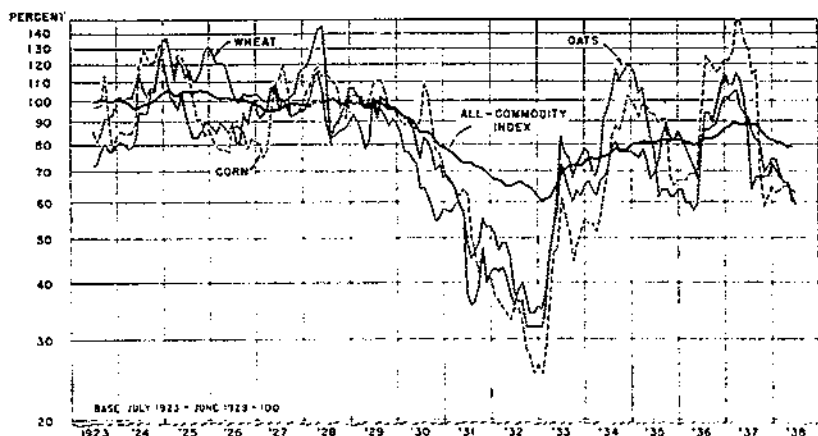


FIGURE 3.—The course of wheat, corn, and oats prices compared with all-commodity prices, by months, July 1923 to June 1938.

prices from July 1923 through June 1938. To permit direct comparison each series is shown in index form having the base, July 1923 to June 1929=100. The grain series consists of monthly weighted averages of spot prices, Chicago, for No. 2 Hard Winter wheat, No. 3 Yellow corn, and No. 3 White oats. Being monthly averages the full range of cash prices is sacrificed for a clearer picture of the trend. To compare properly the rate of price change with that of the all-commodity curve, each series is drawn to a ratio scale. All three grains show a pronounced downward drift in prices following 1929. In percentage of price change wheat declined from December 1929 to December 1932 approximately 63 percent, oats 67, and corn 74 percent. Roughly one-half of these declines find their counterpart in the lowering level of all-commodity prices. Following December 1932 these grains advanced at a much greater rate than the all-commodity average.

In figure 4 the three grain series are shown with a rough adjustment made for the general price factor by dividing each monthly item by the all-commodity index for the same month. After this adjustment there still remains a broad downswing covering the years from 1929 through 1932. Following 1932, rapidly advancing prices to the spring of 1937 more than offset these earlier declines for corn and oats and a

approximately offset them for wheat. Since the summer of 1937 grain prices have again receded both in actual amounts and relative to all-commodity prices. From these facts it seems reasonable to conclude that at least one-half of the broad trend in grain prices since 1929 is accounted for by changes in all-commodity prices. This inference, however, deserves careful interpretation.

In any broad decline or advance in the level of all-commodity prices, many forces are at work, including important changes, for example, in the credit structure, in employment, and in the volume of physical production. It is these underlying forces which generate the business cycle and which greatly influence the general level of prices. Particular series of prices such as those for grain are drawn

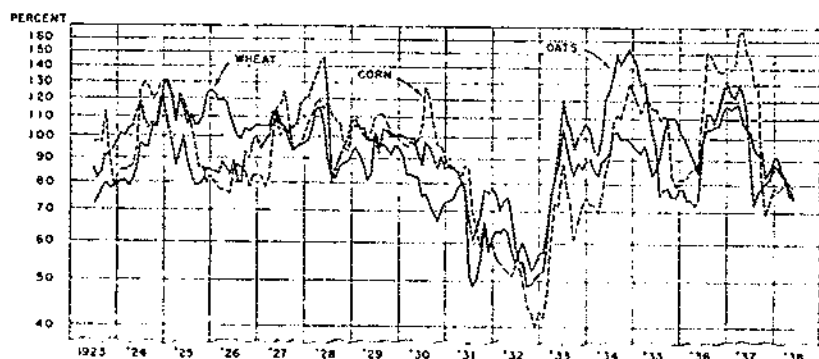


FIGURE 4.—The course of wheat, corn, and oats prices deflated by all-commodity index, by months, July 1923 to June 1938.

into this general movement due in part to widespread increases or decreases in demand and in part to the interaction of demand and supply between competing products. It is only in this indirect sense that it is accurate to say that all-commodity prices have been a causal factor in determining grain prices in recent years.

In this indirect sense, also, it is probable that changes in the general price level have been an important factor in causing grain prices to recede to levels even lower than the 50 percent suggested above. In table 4 are shown the relative price declines and advances of each of the important farm commodity groups during the period, 1929-37. It is noteworthy that for seven of these eight agricultural groups the average decline far exceeds the nonagricultural decline. This fact indicates that whatever the distinctive cause or causes of the wide decline in grain prices during this period the same forces were similarly affecting other lines of agricultural activity.

The demand for these staple commodities is, of course, fairly inelastic which suggests that the piling up of surplus supplies had a very pronounced effect upon their price. But in grain and cotton there is normally a widespread speculative interest capable of carrying forward surplus supplies when prices fall; furthermore, these commodities are fairly nonperishable. Yet they display the largest downswings of the group. There is a suggestion here that the unusual length and severity of the price decline in grain and cotton during this period may have discouraged speculative buying for long-run recovery and at the same time encouraged speculative short selling to profit from

the continued downward trend. Likewise, once well on its upward way, these same speculative forces may have lent buying support to an otherwise rapidly advancing market.<sup>2 3</sup>

TABLE 4.—*Relative decline and advance in agricultural and nonagricultural prices, 1929-37*

Farm commodities <sup>1</sup>	Price index			Percent change, basis 1929	
	Year 1929	March 1933	March 1937	1929-March 1933 <sup>2</sup>	March 1933-March 1937 <sup>3</sup>
Grain.....	120	38	145	70	91
Cotton and cottonseed.....	144	48	116	67	47
Chickens and eggs.....	152	56	102	65	28
Meat animals.....	156	60	129	64	47
Dairy products.....	157	71	125	55	34
Fruits.....	141	65	133	54	48
Commercial truck crops.....	149	92	145	38	36
Miscellaneous.....	140	63	140	62	62
All farm groups.....	140	55	128	62	50
Nonagricultural commodities <sup>4</sup>	93	64	86	31	24

<sup>1</sup> Agricultural Statistics 1938. Base: August 1909-July 1914=100.

<sup>2</sup> Decline.

<sup>3</sup> Advance.

<sup>4</sup> Bureau of Labor Statistics. Base: 1926=100.

### INFLUENCE OF CHANGING SUPPLIES

In its effect upon the drift of grain prices, the influence of all-commodity prices is of primary importance. It accounted in the main for the gradual upward movement in grain prices from 1896 to 1914, for the 6-year upheaval during the World War period, and for the more recent downswing following 1929.

As a cause of intermediate price changes, however, this factor usually ranks second to that of supply. From year to year the supply of grain varies widely causing, in turn, wide annual variations in price. The term "supply" as here used includes the total quantity of marketable grain at any given time together with such amounts as are at the time in process of production. Obviously any quantitative measure of supply so defined can be only a rough approximation, being limited first by the accuracy of estimates of supplies in store and secondly, and to an even greater extent, by estimates of supplies in the process of production. Obviously, too, this factor of supply can be no more accurate in its price effect than the accuracy of opinion regarding it.

Supply as a market factor thus appears as a force considerably removed from supply as an objective quantity. A full appreciation of this fact is essential to an understanding of the position that supply occupies as a price determinant upon organized markets. Ideally those who are willing to trade and who have the purchasing power to do so would each be armed currently with full knowledge of supplies—their amounts past, present, and prospective, their movements, their quality. Actually complete knowledge of this order is unattainable.

<sup>2</sup> For evidence bearing on this suggestion see figures 14 and 15 below showing changes in commercial supplies and open futures contracts in wheat and corn during this period. See, also, the combined net market position of leading speculative traders during this period. (18, fig. 8).

<sup>3</sup> Italic numbers in parentheses refer to Literature Cited, p. 72.

To approximate such knowledge governments and private statistical units make estimates of selected areas on selected dates. Those who make these estimates are usually not market participants. These estimates are probably known to some extent by a good many market participants and thoroughly known by a few. But to many buyers and sellers supply means little more than what is being currently offered in their immediate vicinity. To the farmer this may mean his own and his neighbors' supplies; to the country shipper it may mean only supplies in his immediate area. In the larger markets it may mean only current stocks, receipts, and shipments. To the man in the customers' room of a commission firm it may mean only sales or offers of futures which come to his attention. In any event supply as a price factor can be no more than this partially complete, partially accurate, partially acquired composite of knowledge possessed by those who are willing and financially able to trade.

It is possible to make an estimate of supply as a price factor for any given time though extremely difficult to determine its reliability. It should obviously be based upon information available to traders at the time. The most comprehensive as well as the most authoritative data should be used since there is evidence from the manner in which prices change that at least these more important estimates are given current consideration.

#### WHEAT SUPPLIES

An estimate of this sort is shown in figure 5 for wheat covering the 15-year period, 1923-37. Here an attempt is made to select one period each year when supplies can be estimated with some measure of certainty. Estimates available in August and September of each year are used.<sup>4</sup> By this time the carry-over of wheat from the previous year is known for the United States and Canada. Estimates are also available for stocks on hand in Argentina and Australia, the other two principal producers. Reliable estimates of stocks afloat to Europe and in United Kingdom ports are available. To the stocks on hand in these areas are added production estimates for the current crop for the United States, Canada, and European countries excluding the Union of Soviet Socialist Republics.

Some information may also be secured for carry-overs in Europe, North Africa, and Asia as well as production in North Africa, Asia, and Russia. These were not, however, included in the totals of figure 5 for the reason that they were not believed to be figures that traders would ordinarily consider in appraising the current supply situation. While the Indian crop usually exceeds 300 million bushels India's foreign trade is insignificant. Satisfactory figures for Soviet Russia and China are not available. Estimates of stocks carried over in Europe, Africa, or Asia can be had only on the basis of further estimates of "net retention" for food, feed, and seed from the previous crop (3, pp. 128-148). Since the significant price element in the supply data is the currently known relative change from one year to the next it does not appear that these less certain areas should be included.

Against the annual supply so estimated there is shown in figure 5 the corresponding level of prices. The price series shown as a solid line represents an average of carlot sales of No. 2 Hard Winter wheat,

<sup>4</sup> See Appendix, table 9.



Chicago, during September and October of each year. The dotted line represents this same series after an adjustment for changes in the all-commodity price level.<sup>5</sup> In general this adjusted price series more

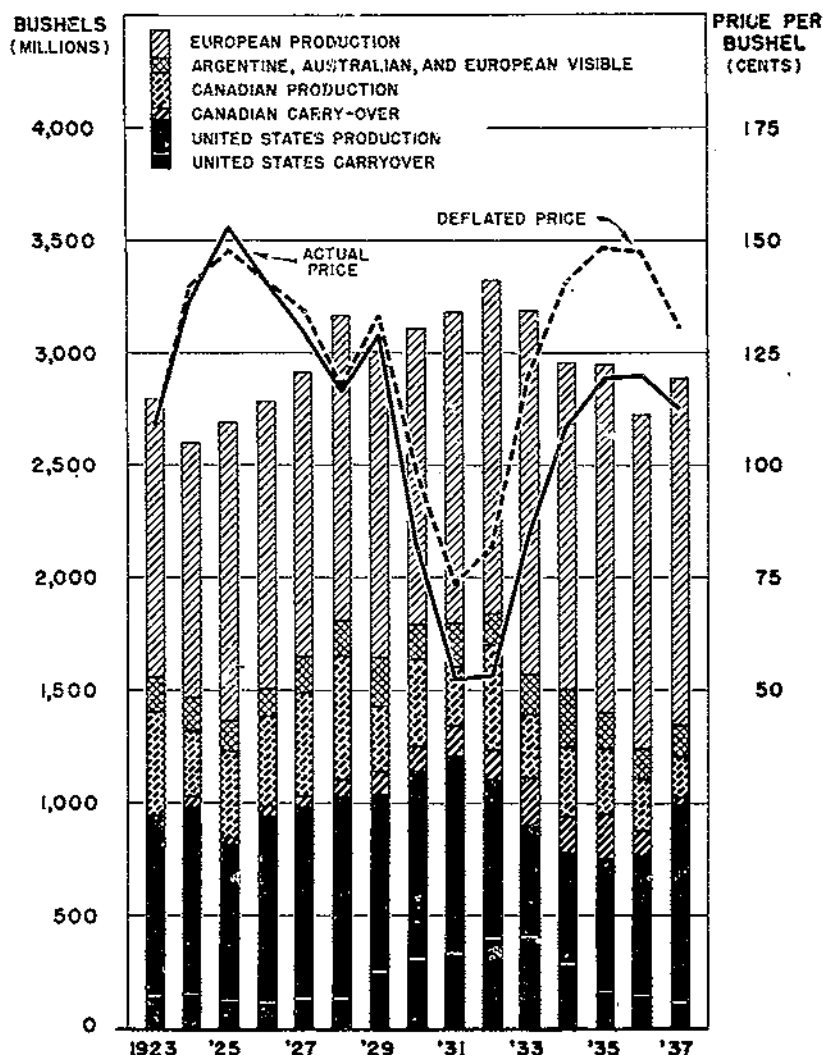


FIGURE 5.—Wheat supplies and price, August and September of each year, 1923-37.

accurately reflects the influence of year-to-year changes in supply than the unadjusted series. Both show in broad movement the inverse relation of supply for these 15 yearly periods.

A close study of the chart, however, reveals a number of marked divergencies. Thus supplies in September 1925 appear larger than

<sup>5</sup> Chicago prices are used here because at later points they must be used in measuring the influences of purely market factors. It is recognized, however, that for comparison with world supplies a market such as Liverpool would be more representative since the problem of price effects when the United States is on a domestic basis would be eliminated. For further reference to this point see *infra* pp. 17-18.

for the year previous, yet prices are definitely higher. In 1926, with supplies approximately the same as in 1923, prices are 30 cents higher. In the years 1928, 1931, and 1933 supplies are about the same, but the corresponding prices are far from the same.

These facts are more easily seen in the scatter diagram of figure 6. Here supplies are plotted against corresponding deflated prices for each of the 15 years. Their average relationship is represented by a line drawn on the assumption that, so far as the factor of supply

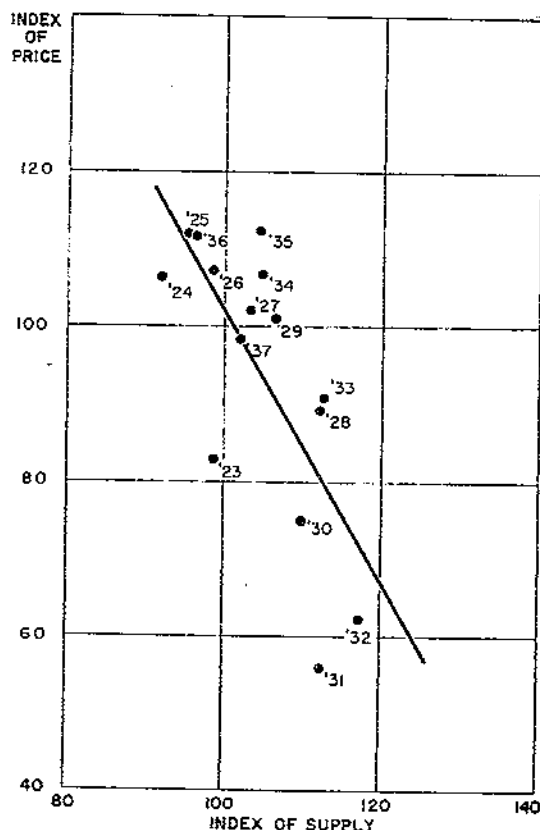


FIGURE 6.—Wheat: Scatter diagram of supply and price with line of average relationship, 1923-37.

alone is concerned, a change of 1 point produces an inverse price change of 1.76 points whether supplies be large or small.<sup>6</sup> Compared with this average relationship, prices in 1923 and 1924 appear too low, especially 1923. In 1925, 1926, and 1927 they correspond fairly closely with apparent supplies. In 1928 and 1929 they appear too high. In 1930, 1931, and 1932 they again appear too low, in 1931 by as much as 20 points. In 1933, 1934, and 1935 they appear too high; in 1936 and 1937 they are again fairly well in line with supplies. Whether these observations regarding this 15-year period approximate accuracy or not it is difficult to say. Looking backward they seem to

<sup>6</sup> The 2 series correlate  $r = -0.729$  (standard error, 15 items = 0.125).

check fairly well if it is assumed that the average supply-price relationship for the entire period is a valid base from which to observe variations.

In September 1923 world supplies appeared large when compared with earlier post-war years. World production increased successively in 1920, 1921, 1922, and 1923. The resumption by Soviet Russia of her former position as a wheat exporter continued to be regarded as a real threat. With other farm prices showing drastic declines and the financial condition of the farmer acute, a decline in wheat prices from \$2.50 to \$1 per bushel in 1923 did not appear at all unreasonable. A wider view, however, would have shown world production in 1923 to be at approximately the same level as it was during the years 1909-13 (14, p. 6), that the all-commodity price level was 50 percent higher in 1923 than in 1909-13, and that were wheat prices to bear this same relation they should be about 40 cents higher. There is here the suggestion, as in 1930, 1931, and 1932, that in the declining phase of the business cycle, wheat prices along with other agricultural prices are lowered under the force of open competition to unusually low levels.

By September 1924 the picture had changed materially. World production appeared about 300 million bushels less, and prices had advanced 35 cents per bushel. Looking back now it would appear that a fuller realization of the supply situation at the outset of the crop year 1924-25 would have placed prices somewhat higher. This same market inertia, however, proved to be the undoing of many merchants and speculators when prices later rose to abnormal levels and broke erratically during the early months of 1925.

For the periods around September 1925, 1926, and 1927 the supply-price relationship apparently enjoyed an era of good behavior. But in 1928 and again in 1929 prices appear relatively high. To some extent at least, though how much it is difficult to say, the level of prices prevailing during this period failed to encourage sufficiently large world consumption. This is evidenced by the fact that at the end of the 1928-29 crop year there emerged a world surplus, over and above normal carry-overs, of around 300 million bushels.<sup>7</sup> This surplus continued through 1929-30, mounted to 350 million by the end of the crop year 1930-31, continued there to the end of 1931-32, rose to 450 million by the end of 1932-33, and to 550 million by the end of the crop year 1933-34. At this point it began to recede rapidly so that by the close of the crop year 1934-35 it was again around 300 million and by the close of the following crop year returned within 100 million of former levels.

To the persistent existence of this surplus, varied though its causes, must be attributed much of the price behavior (in the sense of price levels) during these years. Combined with the onset of depression in 1929-30 it brought wheat prices down to the low eighties and the following 2 years to the 50-cent level. After allowing for the generally lower level of all commodity prices during these years it still appears to have had a depressing price effect considerably out of proportion to its size. During 1932-33, business prospects improved

<sup>7</sup> Davis (4) presents a penetrating analysis of the nature of a world surplus and the causes of such a surplus in wheat following the year 1928. Davis does not regard the level of prices during 1928 and 1929 as an important cause of the surplus but emphasizes Nature's help in good growing conditions, large acreage, good prices in 1925, 1926, and 1927, and improved farm equipment.

at the same time the world wheat surplus materially increased. In resolving these opposing forces, prices in September 1933 appear to have moved to too high a level. They continued relatively high in 1934 and 1935 despite large world supplies. For these 2 years the United States wheat supply decreased rapidly resulting in net imports in 1934-35. Some over-discounting of the improved domestic supply situation appears to have taken place. In 1936 and 1937 the supply-price relationship again appears as a fairly normal one.

It is not necessary here to consider at length the factors causing the appearance, and especially the persistence, of the world wheat surplus during the years 1929-36.<sup>8</sup> It was not an occurrence peculiar to wheat but found also in many other raw materials and reaches

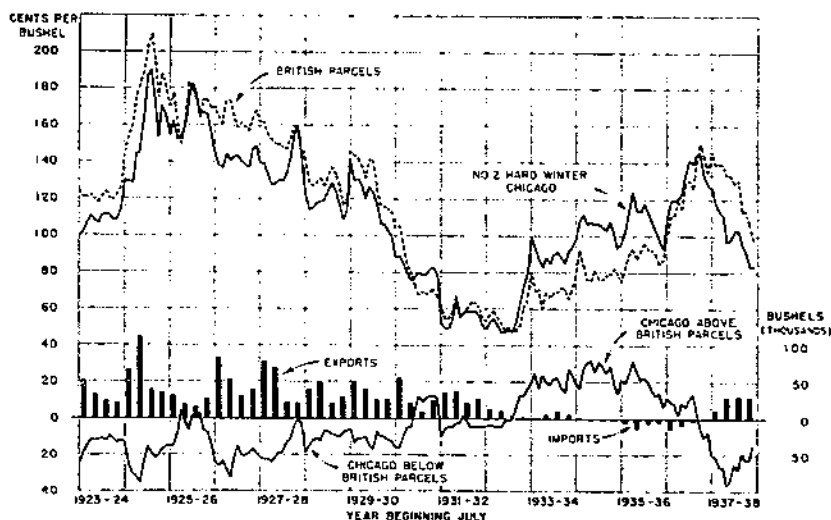


FIGURE 7.—Spread between United States and British wheat prices compared with United States net exports of wheat, July 1923 to June 1938.

back to maladjustments in production growing out of the World War. In most cases these world-wide surpluses began to appear around 1924-25 and reached the crisis stage in 1929-30 (12).

With respect to the situation in the United States, the world wheat surplus presents some distinctive characteristics deserving emphasis. Davis points out that in demonstrating the existence of a world surplus one does not thereby determine precisely where it is or who is responsible for it since it appears as the joint product of all producers and consumers of wheat (4, p. 416). While this is true as a general proposition it does not prevent at least a qualitative appraisal of the part played by any one of the participants.

The contribution of the United States in the maintenance of this surplus appears to have been one of more or less continuously maintaining prices above an export level from November 1930 to May 1937. This fact is shown fairly well in figure 7. Here a representative series of average monthly British wheat prices is shown with Chicago

<sup>8</sup> Various issues of *Wheat Studies* give extended and careful consideration of them.

prices from July 1923 to June 1938. In the lower part of the chart the relative positions of these two series are compared with quarterly net exports (or imports) of wheat and flour from the United States.

As a general proposition wheat will move into export under the force of competition only when the price spread is sufficient to cover costs and a possible profit. From November 1930 through the following 6½ years this spread was not sufficient to encourage the private movement of any substantial amounts. During the crop year 1931-32 fairly sizable amounts were exported but approximately 70 percent of these exports were made by the Grain Stabilization Corporation—a large part on barter or credits extended to foreign governments—and are not properly to be regarded as competitive exports (15, p. 11).<sup>9</sup>

The fact that Chicago wheat prices were high relative to British prices from 1930 to 1937 as well as in September-October 1925 suggests that world supplies be related to Chicago prices for other than these years and United States supplies for these years. A composite supply series so prepared on a comparable index basis correlated with Chicago prices (deflated)  $r = -0.79$ . While this figure is somewhat higher than that obtained by using only world supplies ( $-0.73$ ) it was not thought sufficiently so to warrant further analysis.

#### CORN AND OATS SUPPLIES

In general the influence of supply upon prices is the same for other grains as for wheat. From year to year prices change widely in response to new estimates of supplies. For corn and oats these supplies are produced mainly in the United States and for this reason it is not necessary as it was for wheat to consider production in foreign countries.

Figures 8 and 9 show the supply-price relationship for corn and oats from 1923 through 1937.<sup>10</sup> As in the chart for wheat (fig. 7), an attempt is made to appraise the influences of supply for one period each year, namely, at a time when the most reliable estimates are available. For corn the October 1 carry-over of old corn and the December 1 estimate of the new crop are combined and compared yearly, with the December-January average spot price of No. 3 Yellow corn. For oats a similar comparison is shown between the August 1 carry-over plus the August 1 crop estimate and the August to September average price of No. 3 White oats. Prices are shown both in their original form and after adjustment for changes in the all-commodity price level.

With respect to corn, figure 8 shows for most of the years an inverse relationship of supply and price. During the 1930's the droughts of 1934 and of 1936 are clearly shown with relatively high corn prices. Also the very large supplies of 1932 find their counterpart in extremely low prices for that year. But when compared with earlier years these prices are hard to explain from a consideration of supplies alone. Thus for 1923 supplies were equal to those of 1932 yet prices were more than 30 cents higher. Again in 1924 prices prevailed as high as

<sup>9</sup> Regarding exports from November 1930, when the Farm Board began its stabilization operations, through June 1931, Bennett (3, p. 156-157) states: "It is reasonable to infer that most of the exports of wheat and flour from December through June, except those of flour milled from Canadian wheat in bond, were made by the Grain Stabilization Corporation or of grain purchased from it for export."

<sup>10</sup> See Appendix, table 10.

in the drought year of 1934, but supplies were by no means as low as in the latter year.

In general, corn prices during the 1920's appear on a higher plane relative to supplies than during the thirties. The transition year was 1930. From December 1929 to December 1930 supplies decreased 20 percent at the same time that prices declined 22 percent. Thereafter the supply-price relationship continued on a definitely lower plane.

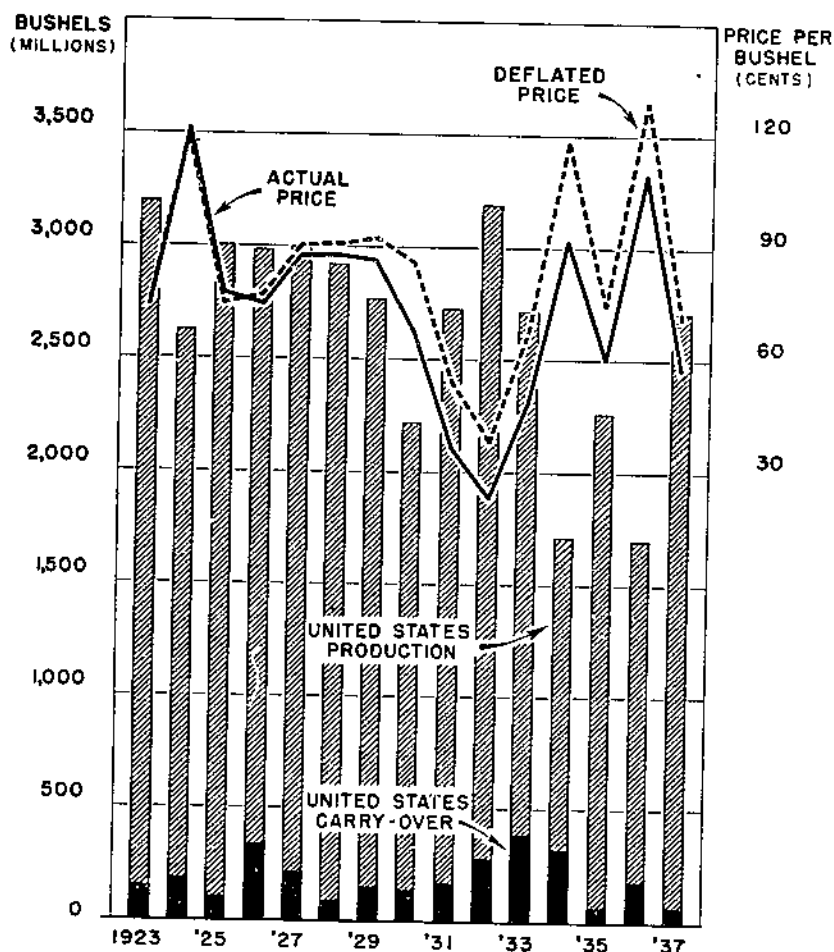


FIGURE 8.—Corn supplies and price, December to January of each year, 1923-37.

This fact is best seen from an examination of the scatter diagram of figure 10 where supplies are plotted against corresponding deflated prices. In general the level of prices during the 1920's ranged from 50 to 80 percent higher than during the 1930's for equivalent supplies. This is best seen by comparing the lines of average relationship shown for the two groups of years.<sup>11</sup> Apart from this broad change in price levels following 1929, changes in supply from year to year account in large part for corresponding changes in the level of prices.

<sup>11</sup> For the years 1923-29,  $r = -0.874$ ; for 1930-37,  $r = -0.965$ ; for the entire 15 years  $r = -0.679$ .

It is difficult to evaluate or even enumerate the forces causing this general lowering of corn prices after 1929. Shepherd has shown that for the years 1899-1915 annual corn supplies and prices had a gradual upward trend but that following the war their trend shifted to a definitely lower level (18). This lowering and leveling of the trends of corn production and prices occurred at a time when business activity and the general price level also declined. With the onset of the

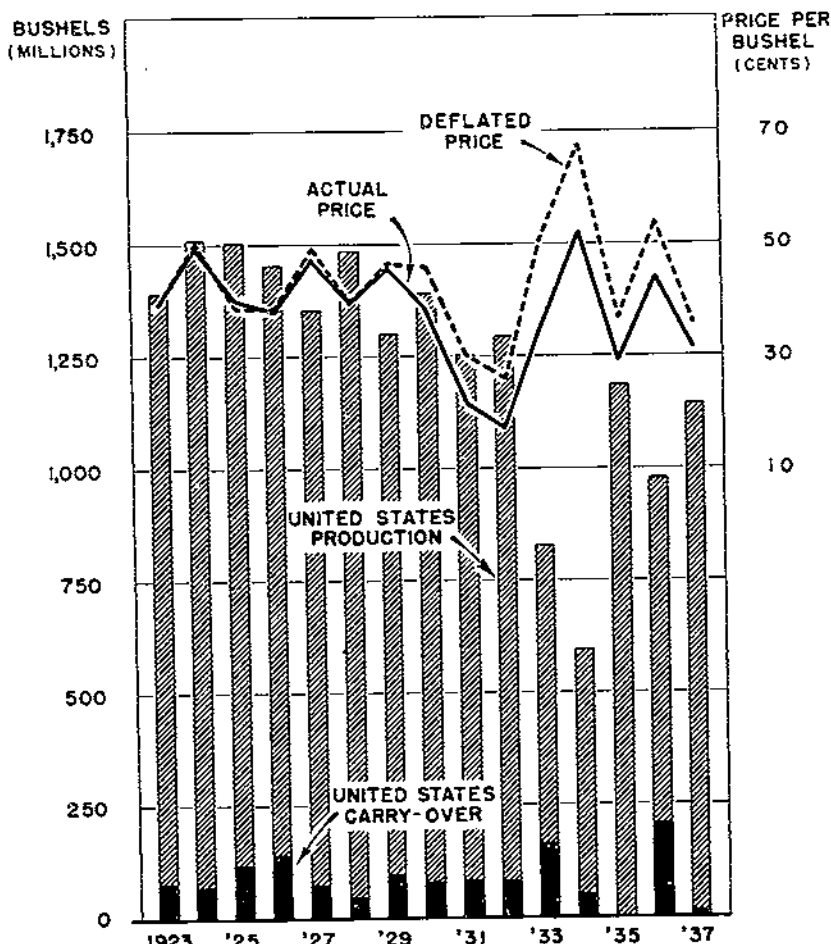


FIGURE 9.—Oats supplies and price, August to September of each year, 1923-37.

depression in 1930 with lowering all-commodity prices, corn prices again moved to lower levels which suggests that these broader factors should be given greater weight than was accomplished by deflating corn prices. Wheat fed on farms increased during 1930-33 about 100 million bushels over previous years and to some extent, though necessarily small, this may have contributed to a lower corn-price level. To some extent also foreign tariffs on pork products beginning in 1930 appear to have been a factor.

For oats, the influence of supply during this 15-year period appears to have been less than for corn. Figure 11 shows the scatter of supply-price relationships for the various years. Here, as with corn, the first half of the period reveals relatively higher prices<sup>12</sup> and again the question arises: "Why should there be this difference in price levels?" In addition to the factors suggested for corn, oat prices appear also to have been actively affected by corn prices in

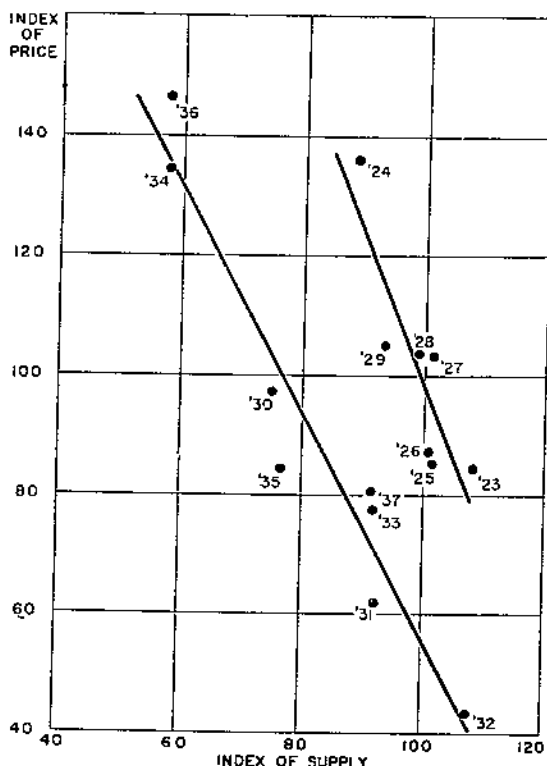


FIGURE 10.—Corn: Scatter diagram of supply and price with lines of average relationship, 1923-37.

certain earlier years.<sup>13</sup> This was certainly the case in 1924. For that year both wheat and corn supplies were lower than for the previous year with prices advancing rapidly. Despite a bumper oat crop the price of oats during August and September averaged 49 cents per bushel, 9 cents above the same months in 1925 and 9½ cents above 1928, years of approximately the same supply. A somewhat similar situation occurred in 1930 when corn prices during August and September averaged 96 cents with a very small crop in prospect. Oat prices during the same period were 38 cents with a rather large supply on hand. For a short while they appear to have

<sup>12</sup> For the years 1923-30,  $r = -0.348$ ; for 1931-37,  $r = -0.966$ ; for the entire 15 years,  $r = -0.572$ .

<sup>13</sup> Some statistical testing of the interrelation of oat and corn prices was done by Shepherd (12) in which it was found that corn prices were capable of influencing oat prices but not the reverse, probably due to the much smaller size of the oat crop.



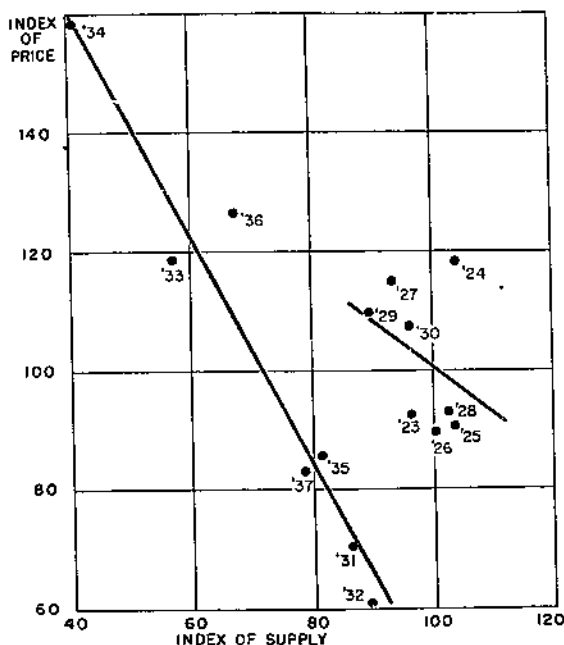


FIGURE 11.—Oats: Scatter diagram of supply and price with lines of average relationship, 1923-37.

been held at a level higher than otherwise through the demand for oats as a substitute for corn.<sup>14</sup>

#### INFLUENCE OF CHANGING DEMAND

Most statistical studies of commodity prices, whether formal or informal, give some consideration to the factor of demand. This is regarded as essential since it is well known that price appears as an equilibrium effect of both demand and supply. Such considerations are not likely, however, to be especially fruitful. This is not because demand is unimportant but rather because (1) for agricultural commodities demand changes quite slowly and (2) such changes as do occur are difficult to measure.

The demand for a commodity at any given time is not one quantity but an array of quantities which will be bought at various prices. It flows from the willingness of persons to buy based upon their tastes, preferences, and purchasing power. It can never be known precisely either in amount or price. Estimates of demand can be made, however, and are continually being made on the basis of sales experience at various prices in the past and under the assumption that demand has not changed in the meantime.

With respect to the various grains, sales experience in earlier years leads to the belief that demand remains fairly constant, at least

<sup>14</sup> A test of the two factors, oat supplies ( $X_1$ ) and corn prices ( $X_2$ ), on oat prices ( $X_3$ ) for the years 1923-30 gave a multiple linear correlation coefficient of 0.77 ( $b_{12.3} = -0.48$ ,  $b_{13.2} = 0.73$ ) against  $-0.348$  simple correlation of oat supplies on oat prices and showing the dominant position of corn prices during these years. For 1931-37 the corresponding multiple coefficient was 0.968 ( $b_{12.3} = -1.79$ ,  $b_{13.2} = 0.23$ ) against the simple correlation coefficient of  $-0.968$ .

within the limits of a few years. It is true that for wheat, the United States per capita consumption has been slowly declining for many years and without apparent relation to changing levels of prices or business conditions. A similar downward trend is to be found for France, Belgium, the British Isles, Canada, and certain other countries (2, p. 381 ff.). This very definitely points to a lowering of demand but it is so uniform and gradual that its price effect cannot readily be measured. There is some evidence also that for corn and oats the post-war demand is less than the pre-war but any change in trend since the war must be regarded as very gradual.

With respect to corn and oats following 1930, the drop in prices relative to supplies suggests a decline in demand for these latter years. This seems to be borne out by the fact that no larger amounts of the products of these grains (mainly meats) were bought in response to lowered prices. There may have in fact been a lowering of demand but the evidence is inconclusive. More years are needed and greater refinement in correcting for changes in the prices of other and especially closely competing commodities before such a conclusion can be drawn with certainty.

### RÉSUMÉ

The materials presented in this section indicate that the fundamental part of market appraisals is based upon facts drawn from the production and merchandising of grain. Variations in production from year to year are of particular importance as a cause of wide swings in price. This is true, however, only because the demand for the products of grain remains fairly constant and is highly inelastic in character.

The data presented in this section were drawn from the best available sources and for a period of time each year when their price influence should be most clearly understood. Even in this setting they constitute a very imperfect picture. Spot prices for the 2-month periods selected were in reality not one average price but many prices, varying materially during each of the 2-month periods considered. Had an attempt been made to account for each of these actual prices or any one of them by relating it to current fundamental data the results would have been much less certain. To an even lesser degree would an established relationship have been found in any comparison with actual prices prevailing for other periods of each crop year. Furthermore within the body of this section no reference has been made to the factor of futures prices and its effect upon spot prices.

Considerations of this character lead to the belief that while actual day-to-day prices are determined primarily by underlying trade facts they are frequently and materially modified by opinions and trading based on much less fundamental matters. Some of these less fundamental elements are considered in the sections which follow.

### BROAD RELATION OF FUTURES TO GRAIN PRICES

In the previous section some of the more fundamental factors affecting grain prices were considered without reference to the part played by futures trading. Grain markets operate today, however, in the presence and not in the absence of futures trading. We do not know

in fact just what kind of market would have prevailed during this 15-year period in the absence of futures trading. These underlying supply and demand factors would indeed have been present but there is no way of knowing whether they would have found the same expression in the market place. It is entirely possible that, in the absence of futures trading, one or two large firms would have dominated central market supplies and prices. To some extent the markets for meat products, for tobacco, and for certain other agricultural and raw material products, where futures trading is of no importance, suggest this possibility. The degree and quality of competition found on these markets are of an order quite different from that found upon grain markets. These things we do know: that present-day grain markets are broadly competitive and that futures trading is a characteristic feature of them. Any inquiry into the position that futures occupy in the determination of grain prices must, therefore, be an inquiry of how such trading improves, modifies, or detracts from this fundamentally competitive status.

The materials presented in this and the following three sections are based on the assumption that competitive grain markets are desirable in the present-day economy of this country. It is further assumed that the type of competitive market desired is one upon which the price structure accurately and continuously reflects underlying supply and demand conditions. To realize such a market two conditions are essential: (1) A complete absence of manipulative forces; (2) a body of buyers and sellers armed with full knowledge of past and current underlying trade conditions.

Such a market is of course an ideal in the sense that it can never be more than approximated. As an ideal it is of value, however, not only in pointing the direction for present and future effort but also as a standard to measure the good or ill effect of a wide variety of present-day practices.

Does the addition of futures trading to purely cash or spot markets bring them any nearer the ideal of a fully informed, nonmanipulated market? Or does it swing them away from such an ideal?

Like most problems in economics the answer here appears to be a mixed one. The Commodity Exchange Administration, and its predecessor the Grain Futures Administration, have during the past 15 years made a number of pioneer investigations of selected aspects of this problem. Naturally most of these have dealt with undesirable market factors that could be improved. A broad appraisal of futures trading should, however, include all desirable aspects as well; and, insofar as available facts permit, this approach will be followed in the present summary.

#### NATURE OF FUTURES CONTRACTS

There are certain essentials regarding the nature of futures contracts which should be thoroughly understood. The first is that grain futures are not grain. A grain futures contract is an agreement to buy or sell grain at a future date. It is in essence a contract, an agreement. It may later be converted into grain just as a credit instrument may be converted into cash. However, it may not be so converted but instead be offset by counter contracts. In the vast majority of cases (over 99 percent) futures contracts are so offset.

But even if not offset they continue as agreements rather than grain during their entire life as futures or, in other words, until a warehouse receipt is actually proffered in exchange for cash.

Being an agreement, a future must at all times have two parties in interest to it. At its inception these parties are popularly referred to as buyer and seller. After the contract has been set up they are said to be "long" and "short" respectively. These long and short positions are referred to collectively as "commitments." Total commitments may be increased at any time by new contracts being set up. They may likewise be decreased through simultaneous offsetting purchases and sales in which equal long and short positions are canceled. Also any party long or short may close out his position by an offsetting sale or purchase to a new interest in which case a transfer of commitments has been accomplished but without any change in total commitments. It follows that commitments do not necessarily have to vary with variations in purchases or sales either at any given time or through any period of time.

### FUTURES VS. CASH DEALINGS

Considerable interest is manifested from time to time in the relation between the annual volume of futures trading and the size of the crop. As a numerical item the volume of futures trading in wheat on all markets during the 15-year period July 1923 to June 1938 averaged 15.6 times the size of the crop; corn futures on all markets for the same period averaged 1.7 times the crop; oats 0.7, rye 12.2, and barley 0.3 times the annual crop. The inference drawn by many from this comparison is that each year the crop is bought or sold through the medium of futures this many times. This in turn leads to the belief that turning the crop over many times as in wheat must have an unwholesome effect upon prices.

Concerning such reasoning it should be pointed out first that, since futures are not grain, the turn-over in futures is not a turn-over of the crop. There is in fact no necessary relationship between the average size of a grain crop and the average volume of futures trading in that grain. This is clearly shown in the ratios just given for the various grains. For wheat the turn-over averaged 15.6; for corn it was only 1.7, and for barley 0.3.

If it were possible to obtain the figures, a better comparison with the average volume of futures trading would be the average volume of cash transactions upon primary markets. If it is assumed that receipts at primary markets are turned over on an average three times yearly, then the ratio of the volume of futures trading on all markets to the cash dealings for the 15-year period July 1923-June 1938 was as follows: Wheat, 11.2; corn, 6.1; oats, 2.8; rye, 7.4; and barley, 0.3 times. From year to year, in contrast to a 15-year average, the volume of trading is likely to show an inverse relation to the size of the crop. This is due to the fact that the smaller the crop the greater the variations in price and in turn the greater the volume of trading.

All this is not to say, however, that the volume of futures trading can have no direct effect upon grain prices. Since futures are contracts giving both buyer and seller the right to convert such contracts into grain, the futures price structure and the cash price structure are at all times closely tied together. This being true a large volume of

trading may very well affect cash grain prices. As a general proposition it is probably true that the larger the average volume of futures relative to cash trading, the more dependent become cash grain prices upon price changes in the futures market. For a commodity such as wheat, futures prices have an important effect upon cash prices. It does not follow, however, that this effect is necessarily an unwholesome one; nor does it follow that it is necessarily a wholesome one.

#### VOLUME AND OPEN CONTRACTS COMPARED TO FUTURES PRICES

Figure 12 for wheat and figure 13 for corn show the broad relation between volume of futures trading, open contracts, and price for the 15-year period July 1923-June 1938. The data relate to the Chicago Board of Trade and show: (1) For volume, the total trading each month, all futures combined; (2) for open contracts, the range each month, all futures combined; (3) for price, the range each month of the dominant future<sup>15</sup> with the monthly average price of No. 2 Hard Winter wheat and No. 3 Yellow corn shown as a circle.

No very definite relationship is shown in figures 12 and 13 between the volume of trading and the level of futures prices. There is some tendency for volume to be large when prices are high, but it is a very general one and probably due more to the movement of prices than to their level. With respect to the monthly range in futures prices and the monthly volume of trading there is some direct relation, though the charts are not arranged to bring this fact out clearly. The correlation for wheat for this period is  $r = +0.64$  and for corn  $r = +0.65$ . This, however, does not demonstrate that variations in the volume of trading cause a larger or smaller price range nor that changes in price range cause corresponding changes in the volume of trading. Because changes in the physical supply of grain, changes in potential supply (through changes in growing conditions) and in demand are fundamental, the presumption is that these underlying factors, through trader opinion, cause the price range and the volume of trading to vary directly. Information to be presented later, however, indicates that at times unusual trading activity does cause unusual price changes.

Open contracts during this 15-year period reveal in their broad movements nothing more than a general direct relation to the volume of trading and to the course of prices. The largest range in open contracts for wheat was in July 1929. This was also the month of largest volume of trading and a month in which prices moved up through a wide range. July 1933 was another month of unusual range in open contracts and price together with a very large volume of trading. Also for certain longer periods for wheat such as November 1924 to April 1925, November 1925 to February 1926, July to November 1929, May to October 1933, and July to October 1934, and for corn such as November 1924 to April 1925, January to April 1928, and May 1933 to April 1934, the open contracts grow in size with upward swings in prices. These movements suggest something in common for these periods—possibly a wider market interest attracted by rising prices, possibly rising prices as a result of larger contracts with the initiative being taken by the longs as the market advances and by those selling

<sup>15</sup> Futures used were: For November, December, January, February, and March, the May future; for April and May, the July future; for June and July, the September future; and for August, September, and October, the December future.

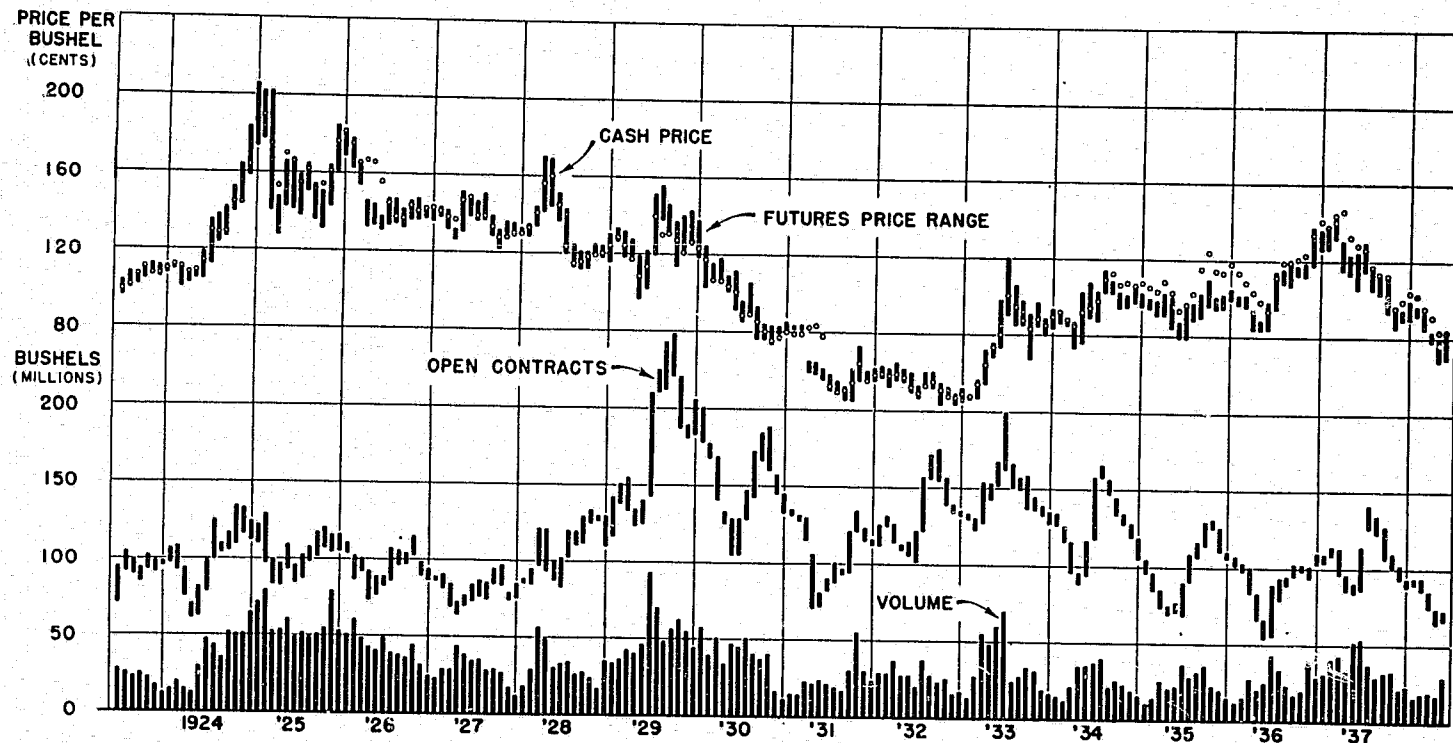


FIGURE 12.—Wheat: Volume of trading and range of open contracts, all futures combined, compared with the range in price of the dominant futures, Chicago Board of Trade, by months, July 1923 to June 1938.

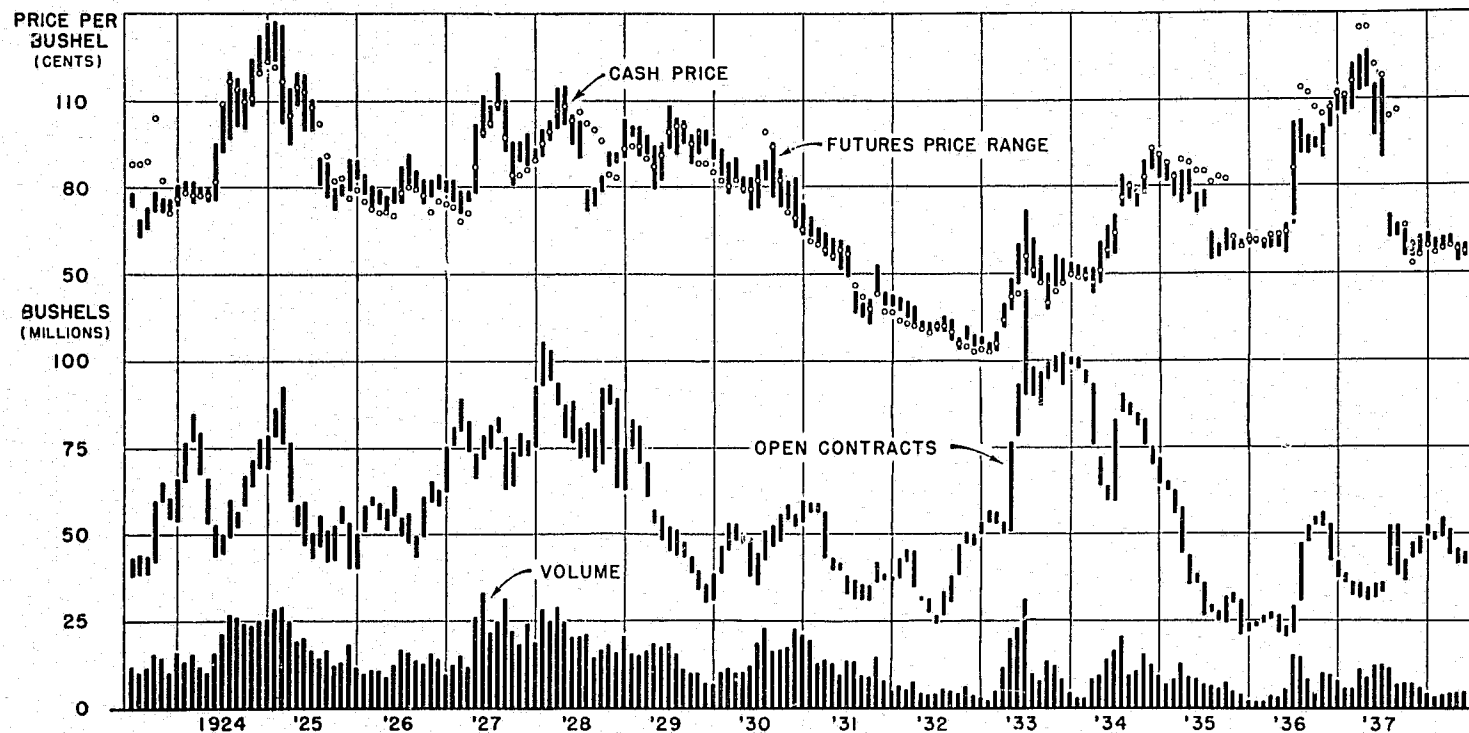


FIGURE 13.—Corn: Volume of trading and range of open contracts, all futures combined, compared with the range in price of the dominant futures, Chicago Board of Trade, by months, July 1923 to June 1938.

to liquidate as the market declines. Certain of these outstanding periods will be considered more fully at a later point. For this entire 15-year period, however, open contracts do not correspond closely to either prices or volume.

### CASH AND FUTURES PRICES COMPARED

Shown as small circles in figures 12 and 13 are monthly average cash prices—for wheat, No. 2 Hard Winter, Chicago; for corn, No. 3 Yellow, Chicago. In general these cash prices advance and decline throughout the period as the course of futures prices varies. A close examination of the figures will show, however, that this correspondence is not a perfect one. For certain of the months cash prices appear above the range of futures prices, for others below. To those who use the futures market for hedging or as a basis of purchase or sale, these variations between cash and futures prices are often more important than the broad movements of prices.

### WHY CASH PRICES DO NOT PARALLEL FUTURES

Cash prices do not precisely parallel futures prices due to four broad types of factors. The first and most easily understood of these is position or location. Futures prices are based upon grain located at one and only one central point. In contrast spot prices reflect many locations. A given shipment of grain may be bought at an interior point at a discount and later sold at a premium relative to central market prices due to purely local supply and demand conditions.

A second factor is quality. Again as a general rule, futures prices reflect only one grade of grain and usually the bottom of that grade. Spot or cash prices in contrast reflect as many grades, and qualities within these grades, as are offered for sale. Upon the larger markets the quality of grain is continually changing. Certain grades are in demand leaving other grades in relatively greater abundance; new receipts flow in; supplies carried forward may improve due to lowered moisture content, cleaning, or conditioning or they may deteriorate due to difficulties or inefficiency in handling. These various qualities and changes in quality give to cash grain prices a range and variability without a counterpart in futures prices.

The element of time accounts for the third factor between cash and futures prices. Futures prices reflect for each separate future one period in time, namely, the month of delivery. Spot prices, based on immediate delivery, reflect day by day throughout each crop year a continually advancing point in time. If there is no other counterbalancing factor, this forward change in time, involving costs of storage—interest, insurance, wages, overhead—will cause cash prices to advance as a crop year progresses.

Random causes constitute the fourth factor causing cash-futures price disparity. Assuming the elements of time, place, and quality are either held constant or fully accounted for, there remain many factors which affect cash and futures prices unequally. They are for the most part uncertain and nonrecurring, hence difficult to foresee and allow for. Changes in relative demand between various qualities, locations, or times of delivery of a particular grain cause changes in spot prices without equal changes in futures prices. Here also belong



the endless play of trading forces found in the futures market and imparting to it its characteristic sensitive price structure. These trading forces reflect themselves only in part in cash grain prices.

#### CASH PRICES BASED ON FUTURES PRICES

For wheat, and to a lesser extent for the other grains, the practice of basing cash prices upon futures has become an established practice. Carlot bids and offers, both on the exchange and to the country, are built up by adding to the futures price (algebraically) a premium or discount for quality, location, time, and one or more special factors, including competition, as they are estimated at the moment. In this process it is not altogether accurate to say that the futures price is accepted at its face value by cash grain dealers. Futures may in fact be regarded as being too high in which case the premium or discount will also reflect this lack of faith. But normally futures prices are regarded as basic in the formulation of cash grain prices.

Because of this price-basing policy, the inference is sometimes made that futures prices determine cash prices. This does not necessarily follow, however. Broadly viewed, both cash and futures prices are determined by the same body of underlying conditions: Supplies, their location, quality and movement, demand, prices of other commodities, general business activity. These factors serve as the main though not the only source of opinion in both the cash and futures market.

#### FUTURES PRICE CHANGES PRECEDE CASH

It is upon the futures market, however, that this and other information is usually first translated into price. This is especially true where the trade in futures is relatively large. Here timely as well as profuse information is demanded. The futures market is large enough to support the expense of private wires, news gathering services, floor brokers, and traders. From these flow a fairly continuous stream of bids and offers as well as prices throughout each trading session. The force of this trading is too powerful to disregard were those who trade in cash grain inclined to do so. Instead they follow closely the course of futures prices and base their bids upon them. For this reason it is essential that those who trade upon futures markets be well informed and that their trading be free from manipulation in its market effect. Manipulation is here used in the broad sense of knowingly influencing prices.

#### TYPES OF FUTURES TRADERS

Table 5 throws some light upon the type of trader found on present-day markets. It is taken from a Grain Futures Administration report (1) showing all traders having commitments in wheat or corn futures on the Chicago Board of Trade as of September 29, 1934. The study represents a cross-section survey in which are traced the ultimate parties in interest of all open contracts and an inquiry made of their professional or business status.

There were 13,194 individuals, firms, and corporations having a position in wheat, with commitments totaling over 157 million bushels long and an equal quantity short. In corn the various traders totaled

8,089, holding commitments long and short in excess of 89 million bushels. There were 2,919 traders having positions in both corn and wheat, making a net of 18,364 separate traders in the market in both wheat and corn. These 18,364 traders were located in every State in the Union and in several foreign countries with, however, the greatest concentration in the Central West. They held separate commitments ranging from 1,000 bushels to over 10 million bushels.

TABLE 5.—Analysis by occupational groups of accounts having commitments in wheat and corn futures, Chicago Board of Trade, September 29, 1934<sup>1</sup>

Class	Accounts	Open commitments			
		Total commitment of group		Net commitment of group	
		Long	Short	Long	Short
Wheat:	Number	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels
Farmers.....	1,492	6,068	695	5,373	
Housewives.....	802	8,304	1,015	7,289	
Clerks, small merchants, etc.....	6,237	44,403	6,462	37,941	
Executives, financiers, etc.....	3,068	55,071	19,253	35,818	
Speculative corporations.....	39	3,725	240	3,485	
Total speculative.....	11,638	118,631	27,666	90,965	
Elevator hedgers.....	738	11,577	76,949		65,372
Processor hedgers.....	309	7,529	51,758		43,749
Total hedging.....	1,047	19,106	128,227		109,121
Foreign and miscellaneous.....	500	19,580	1,402	18,178	
Grand total.....	13,194	157,317	157,295	22	
Corn:					
Farmers.....	1,047	3,326	932	2,394	
Housewives.....	490	4,237	765	3,472	
Clerks, small merchants, etc.....	3,730	23,145	8,535	15,610	
Executives, financiers, etc.....	1,875	29,681	9,148	20,533	
Speculative corporations.....	27	5,825	417	5,408	
Total speculative.....	7,176	66,214	17,797	48,417	
Elevator hedgers.....	572	4,064	63,730		59,666
Processor hedgers.....	122	4,857	7,209		2,322
Total hedging.....	694	9,551	70,939		61,388
Foreign and miscellaneous.....	219	13,850	779	13,107	
Grand total.....	8,089	89,615	89,515	136	

<sup>1</sup> From U. S. Department of Agriculture Circular 397.

The traders and their positions are further classified in table 5 as speculative and hedging.<sup>16</sup> Broadly considered, accounts in futures must be either speculative or hedging. A speculator is defined as one whose primary object is the assumption of price risk for a possible profit and a hedger as one whose primary object is the avoidance of price risk at the sacrifice of a possible profit. Hedgers are in turn classified as elevators, those handling grain in wholesale channels, and processors, those engaged in the manufacture of grain products.

Speculators as a group can be classified in a number of ways. Classified by function they may be (1) open speculators or (2) spread-

<sup>16</sup> There is also shown a "foreign and miscellaneous" group. Information was insufficient to classify accurately these accounts. They included some hedging accounts, though as a group they were apparently predominately speculative.

ers, the latter type being those who follow the practice of setting up equal and opposite futures positions between two futures in the same or different markets with the object of profiting from relative price changes. Open speculators, in contrast, assume either a long or short position in futures, but not both, for a possible profit. Open speculators in turn may be professionals, such as floor traders or scalpers attempting to profit from small intraday price changes or traders carrying open positions for periods of time longer than one day, or they may be nonprofessionals—those whose principal occupation lies elsewhere but who trade in futures from time to time.

In the classification shown in table 5, the vast majority of the speculators are of the nonprofessional, open-speculation type. Farmers, housewives, clerks, and small merchants are certainly not professionals, yet they account for over 70 percent of the number of speculators in wheat and corn. They held approximately 45 percent of the total open speculative commitments in these two grains. For the most part, also, the executive-financier group are nonprofessional. Some of the occupations found among these traders with the number of accounts include: Physicians, 523; salesmen, 492; attorneys, 397; insurance brokers, 200; teachers, 163; bankers and employees, 126; engineers, 124; accountants and auditors, 119; dentists, 112; secretaries and stenographers, 104; clergymen, 25.

One further observation regarding the data of table 5 is in place. The commitments held by the various speculative groups differ materially from those of the hedgers. Eighty-eight percent of all the accounts in both wheat and corn were speculative; 8 percent were hedging and 4 percent were foreign and miscellaneous. The speculative accounts were mostly small, averaging as a group about 10,000 bushels each; the hedging accounts were much larger, averaging among the long accounts 22,000 bushels and among the short accounts 420,000 bushels. Most of the speculative accounts, in number of accounts as well as in position, were long while most of the hedging accounts, in number and position, were short.

### RÉSUMÉ

This section has dealt with certain of the broader aspects of futures trading in their relation to grain prices. A number of important effects grow out of the addition of a futures system to cash-grain trading. There is a more urgent demand for timely information and for information of every sort capable of having a possible price effect. This results in futures prices being highly sensitive. Cash prices in turn reflect these changes with further premium or discount adjustments for variations in quality, location, time and random factors.

Those who trade in futures are not the same body of individuals as those who trade in cash grain. In addition to hedgers and other cash-grain interests using the futures markets, there exists a large body of speculators whose only interest is in price change. They vary widely in professional and business experience; also in their knowledge of grain markets and prices. They vary, also, from the few who trade in large amounts to the thousands who trade in small amounts. Their collective trading gives direction to futures prices and in turn to cash prices. To the extent that it is based upon a full

knowledge of underlying cash-grain conditions and is free from manipulation the resulting prices will best satisfy all interests concerned. This is on the assumption, however, that a competitive price is desired.

### VISIBLE SUPPLY AND HEDGING

There are a number of groups involved in the marketing and merchandising of grain and grain products. These include farmers, country elevators and mills, terminal elevators and mills, processors, bakers, and retailers. Not all of these use the futures market as a means of hedging. At the two extremes—farmers and retailers—very little hedging is done. Country elevators and country mills hedge occasionally and a few consistently such as units of a line company with headquarters at a central market. Some of the larger baking companies have been known to hedge, though as a rule they do not.

This leaves as the principal hedging groups the large elevator, mill, and processing companies having headquarters usually at leading market centers. Among these three groups the most consistent hedgers are the elevator companies. The supplies they handle consist of grain rather than products of grain and as such bear a close price relationship to futures. Their business consists of buying, usually in carlots, from country shippers and selling later to mills or processors or into the export trade. If they are to do business they must buy when supplies are moving. This usually results in their acquiring large supplies following harvest. Later the grain is sold at such times as it appears the maximum possible profit (or minimum loss) will result. Such a profit (or loss) is a net product of gains and losses upon their dealings in both cash grain and futures. Their sales policy is, therefore, continually influenced by the relation of cash to futures prices.<sup>17</sup> When this relationship is unfavorable to holding supplies immediate sales become urgent; when favorable they may hold supplies for long periods of time.

### INFLUENCE OF COMMERCIAL STOCKS UPON OPEN CONTRACTS IN FUTURES

In figures 14 and 15 the United States commercial supplies of wheat and corn are shown for monthly periods, July 1923 to June 1938. Against these stocks stored at central markets are plotted the total open-futures contracts, long and short, on the four principal exchanges for wheat—Chicago, Minneapolis, Duluth, and Kansas City—and on the two principal exchanges for corn—Chicago and Kansas City. The charts are designed to show the influence of commercial supplies upon the extent and character of futures contracts regularly carried forward.

With respect to both charts it will be observed that commercial supplies show very definite seasonal variations and that during the past 15 years large cyclical changes have also occurred. These variations find their counterpart in the changes taking place in total open contracts. An increase in commercial supplies creates a demand on the part of the buyers of these supplies for short futures positions as

<sup>17</sup> The point of view here expressed is that of the individual elevator company. Collectively (and at times individually for the largest companies) their sales and purchase policies constitute the major factor in determining the relation between cash and futures prices.

a hedge. Their short sales of futures increase the total short commitments thereby causing simultaneous offsetting long commitments to be set up. As pointed out in the previous section, these long positions are held mainly by a varied assortment of speculators.

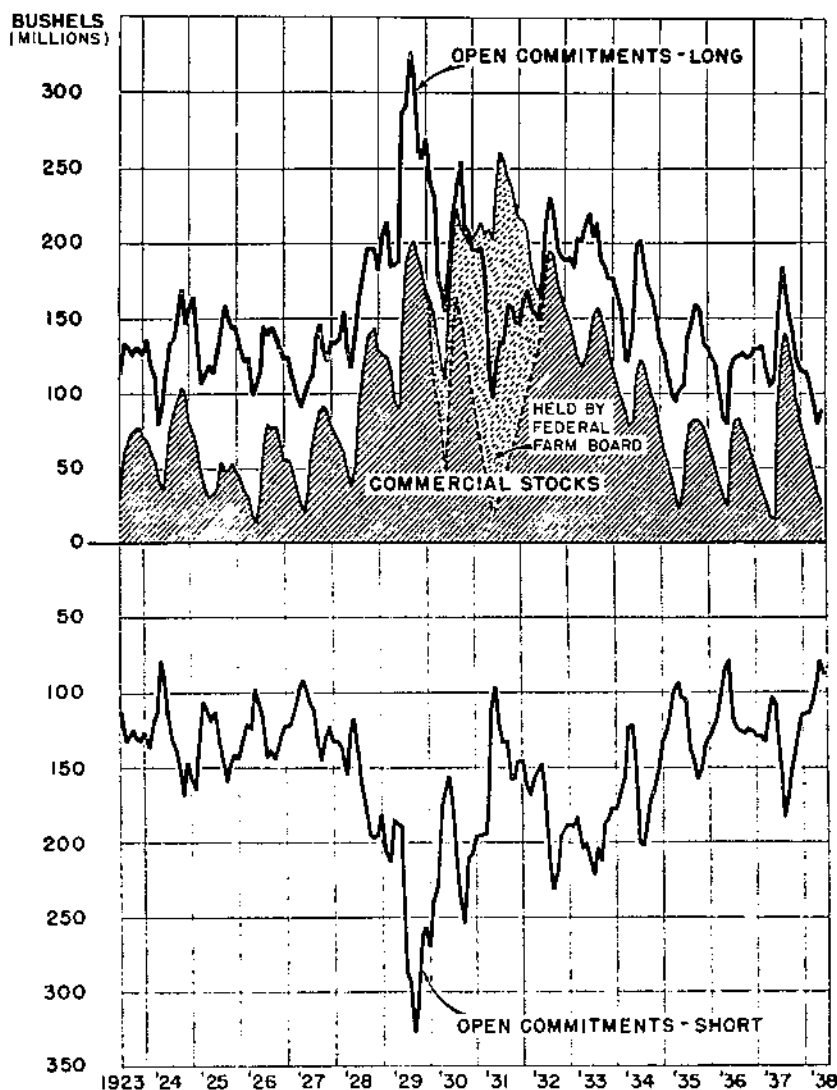


FIGURE 14.—Wheat: Commercial stocks compared with futures commitments at four leading markets, by months, July 1923 to June 1938.

These long and short futures commitments are not exactly the same as the commercial supplies either in amount or in their changes from month to month. One reason for these differences is the fact that a considerable part of open futures contracts represent purely speculative positions on both sides of the market. Another reason is that

commercial supplies are only a rough approximation of the demand for hedges. Some hedges arise from supplies at country points which are not shown in the commercial stocks; not all the commercial stocks are necessarily hedged at all times; hedges are also set up against

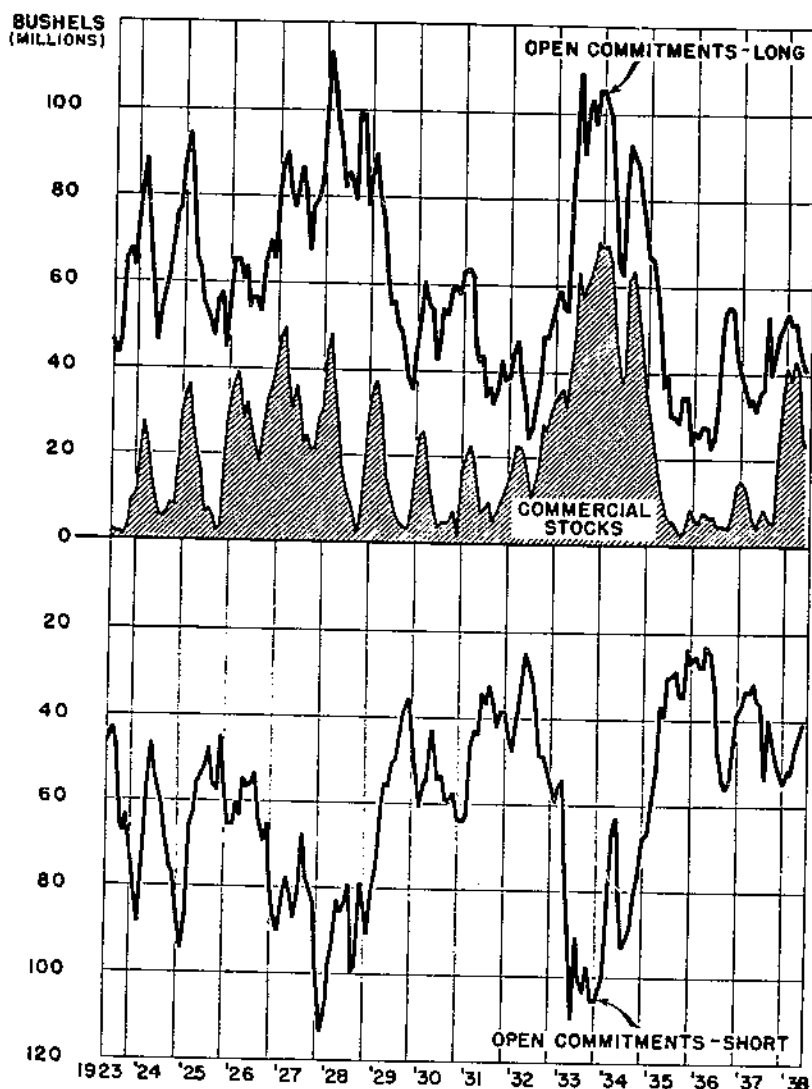


FIGURE 15.—Corn: Commercial stocks compared with futures commitments at two leading markets, by months, July 1923 to June 1938.

forward orders; finally, where commercial supplies owned are offset for an individual company by forward sales at fixed prices the need of hedging is to that extent removed.

Mention should be made of the 1930-32 period for wheat during which time the Federal Farm Board was active. Through the instrumentality of the Grain Stabilization Corporation, it purchased

and carried unhedged large quantities of wheat with the result that the demand for hedges from the owners of remaining supplies greatly declined. This is clearly shown in the relative size of the commercial supplies to the open contracts during this period. An estimate of the Farm Board holdings of wheat in commercial channels for this period (20, fig. 2 and p. 62 ff.) is shown in figure 14.<sup>15</sup> With this portion deducted the remaining private commercial supplies more nearly conform to the open contracts.

#### NET COMMITMENTS OF LEADING HEDGERS

Reports are rendered daily to the Commodity Exchange Administration by all hedgers having market positions of 200,000 bushels or more in any one future on any one market. These "200,000-bushel-or-more" accounts are few in number but range upward in size to the very largest with positions of several million bushels. They do not include all open hedging accounts since as small an amount as 1,000 bushels may be employed as a hedge. The combined positions of reporting hedgers, however, probably account for 80 percent or more of all hedging positions (1, p. 6). They are the market leaders among the hedging group, and their combined positions should typify fairly well the combined market positions of all hedgers.

In figure 16 are shown for wheat the combined net-futures positions of these leading hedgers on the Chicago Board of Trade for the three crop years, July 5, 1935 to June 24, 1938. These positions are compared with commercial supplies and cash prices for corresponding dates each week. During each of these three crop years the net position of the hedging group was short but varied widely within each crop year. In general these variations grow out of corresponding variations in the movement of wheat to commercial centers but the correspondence is not a perfect one.

To facilitate close comparison the short hedges are shown inverted in figure 16. For the crop year 1935-36 the trends of hedges and commercial supplies were fairly close and continued so until the end of July 1936. From this point until the end of December 1936 the hedge positions failed to follow fully the commercial supplies. This was also true for 1937-38 beginning again at the end of July. It is difficult to determine the reasons for deviations of this kind. A suggestion sometimes advanced is that hedgers remove their hedges when they feel that prices are unlikely to decline. Applying this somewhat naive suggestion to the crop year 1936-37 it would appear that some of the hedgers failed to hedge fully their cash positions because the outlook for cash prices was at least not a bearish one. Prices did move to higher levels—from \$1.14 for the week ending August 1 to \$1.37 for the week ending December 19; and it may be assumed that at this higher level the outlook became uncertain and for this reason hedges were replaced.

The crop year 1937-38, however, presented a different picture. At the end of July wheat prices had declined from an earlier level above

<sup>15</sup> Estimates of cash wheat held in commercial positions by the Grain Stabilization Corporation and used in figure 14 were as follows: End of February 1936=12 million bushels; end of March=20 million; April=40 million; May=40 million; June=60 million; July, August, September, and October=60 million; November=70 million; end of June 1937=126 million; end of June 1938=36 million; end of July=14 million; end of August=3 million.

\$1.40 to \$1.23 per bushel. Perhaps it was assumed by some that a further lowering of prices was unlikely. At any rate, whatever the reason, some failed to hedge fully beyond this point in spite of the fact

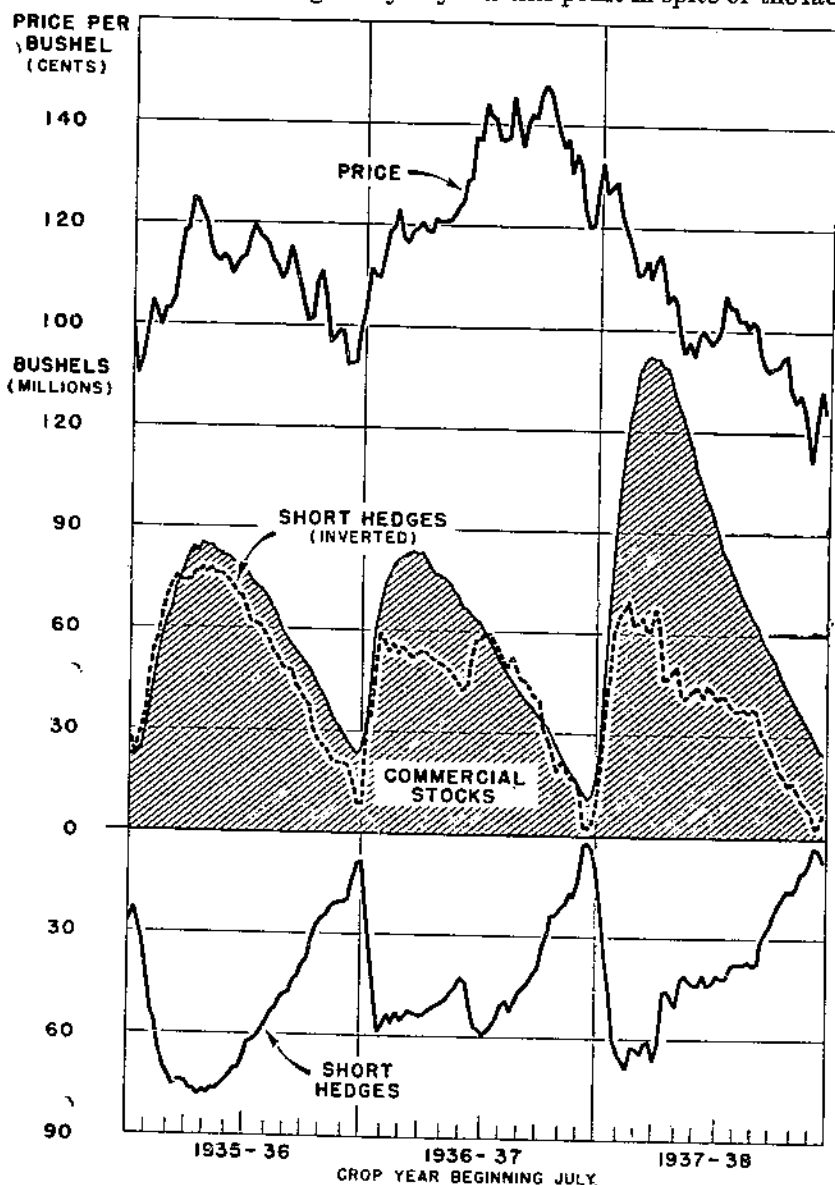


FIGURE 16.—Wheat: Combined net positions of leading hedgers, Chicago Board of Trade, compared with United States commercial stocks and prices, end of each week, July 5, 1935 to June 24, 1938.

that wheat prices continued downward to reach levels below 80 cents per bushel.

Figure 17 shows the combined net position of the leading hedgers in corn for three crop years, November 1934 to October 1937. As in



figure 16 these positions are compared by weeks with commercial supplies and cash prices. Commercial supplies were quite small during most of this period, reflecting the effects of extremely small

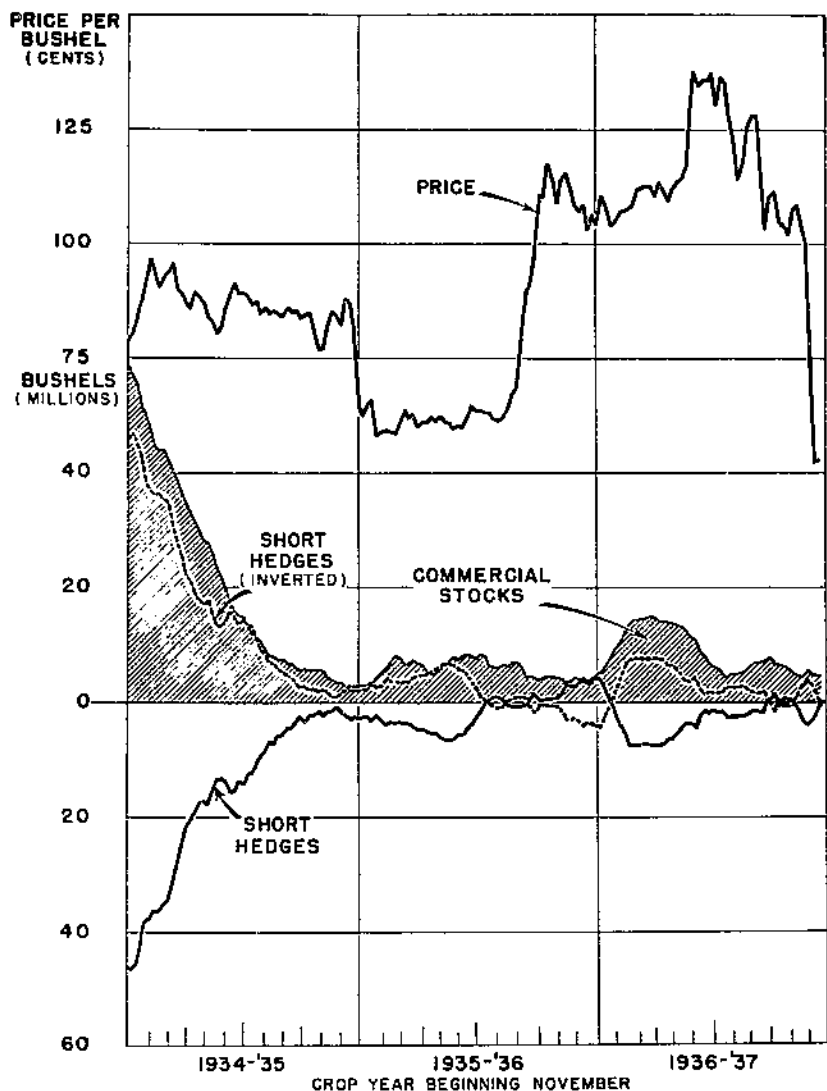


FIGURE 17.—Corn: Combined net position of leading hedgers, Chicago Board of Trade, compared with United States commercial stocks, and Chicago No. 3 Yellow prices, end of each week, November 2, 1934 to October 22, 1937.

crops in 1934 and 1936. In general the positions held by the hedging group were inversely related to the commercial supplies, declining during the crop year 1934-35 from 46 million to 2 million and varying over comparatively narrow ranges thereafter. During portions of 1936 and 1937, the combined hedge position was net long due to the influence of long purchases of futures made by processing com-

panies. While these are here classified as hedges, in a strict sense they represent quasi-cash purchases to be replaced later by actual purchases of corn.

### POSSIBLE PRICE EFFECTS OF HEDGING

The following facts regarding the hedging of grain are fairly well established.

1. It is a practice centered mainly in the large elevator and merchandising companies located at leading market centers.
2. While these companies hedge both their unsold supplies and their forward orders, taken as a group the former usually predominates, requiring a net-short futures position.
3. This net-short futures position is, as a rule, determined for the hedgers by the size of their commercial stocks of grain stored at leading centers and varies seasonally and from year to year as these stocks vary.
4. These hedgers are few in number but hold large futures positions, their positions changing gradually from day to day.
5. There are in actual practice important exceptions to this usual experience both from time to time and among the various hedgers.

With the possible exception of so-called "hedge pressure," it is generally thought that these various practices have little if any direct effect upon grain prices. To have a direct effect hedges would have to be made in such quantity or in such a manner that prices would move currently in response to them. Since sales or purchases are made gradually and largely in response to the movement of supplies it is usually thought that their effect upon prices must be negligible.

This type of reasoning deserves close examination quite apart from what the actual evidence of hedging may disclose. It is often pointed out that the main motive of hedgers is to avoid loss from uncertain price changes. While this is an important matter to them, it is not their main objective. Their main objective, as in all lines of economic endeavor, is to make money. This they do by dealing both in futures and cash grain. Their profit is a joint product arising out of relative changes in the position of cash to futures prices. Since futures prices represent one blade of the scissors they are very vitally interested in their movements. Their interest, however, is not in higher or lower futures or cash prices as such but in their relative changes. These relative movements are susceptible of market influence, particularly with the approach of a delivery month. For this reason they are given separate consideration in the section on The Delivery Problem.

While their interest lies in relative prices, the individual or combined trading of hedgers may be sufficient to affect futures prices directly. Some of the largest accounts build up futures positions of several million bushels. As an aggregate of all hedgers, their commitments run into the tens of millions. In the survey of contracts open on September 29, 1934, wheat hedgers as a group held long commitments of 19 million bushels and short commitments of 128 million; corn futures hedges amounted to 9 million bushels long and 71 million short (see table 5, p. 31). While these positions are acquired and liquidated in line with variations in commercial supplies, there are periods when the changes reach large proportions. This is most likely to be the case in the fall of the year when supplies are moving to market. As these supplies are bought, corresponding amounts of futures are sold short as a hedge. When these sales are accompanied by a weakening of

prices their apparent effect is usually referred to in trade journals as hedge pressure.

That there is any necessary connection between sales by hedgers and declining market prices cannot, however, be determined by casual observation. Those having the task of preparing market gossip are likely to cast about for an explanation of a price decline and hit upon sales by hedgers. The next day prices may be up with hedge sales equally large in which case no reference is made to hedge pressure. Just how important as a market force hedge pressure may be it is difficult to state. The evidence received thus far by the Commodity Exchange Administration does not reveal any consistent relationship between these sales and the movement of futures prices.

This may be due, however, to the presence of other compensating market factors. Irwin has found from a study of small trader activity a pronounced tendency for wheat farmers and others located in wheat producing areas to buy futures following harvest (8).<sup>19</sup> These purchases appear on the market at approximately the same time as hedge sales. Like hedge sales they consist of many small individual transactions, which are held for some time and result in an aggregate market position of large proportions. These two market forces are opposite and compensatory in character. It is reasonable to believe that their net effect may be to advance prices in years of unusual agrarian buying, to cause them to decline when buying support is small in proportion to hedge selling and for certain years to be neutral in their price effect.

In one further respect the market position of hedgers can indirectly influence prices. To some extent, though necessarily small, hedge sales are offset by hedge purchases. Mainly, however, they are offset by the purchases of speculators. As a result the typical situation is one in which several million bushels of open contracts are carried forward on the short side by a small group of hedgers and on the long side by a much larger group of speculators. In this setting the hedgers are much better situated than the speculators. They are merchandisers of grain and as such know its location, movement, and condition. If need be they can usually deliver at least a part of their supplies on their futures contracts. Their profit is not solely dependent upon advancing or declining futures prices.

In contrast, many of the long speculators know little or nothing about the handling of actual grain. Their sole interest is in profiting from an advance in futures prices. If prices do advance some will want to sell to realize a profit; if prices decline some will have to sell to limit their loss. It is at this point that the short positions of the hedgers become important. If they are not ready or do not choose to buy in their short positions, speculators desiring to sell must find other speculators who are willing to buy. Considered as individuals the speculators can sell and pass their long commitments from one to another as much as they like; as a group they cannot get out of them until the hedgers are ready to close their short positions.

This indirect influence of short hedgers upon speculative longs is likely to be an important price factor only when the speculative urge

<sup>19</sup> Reasons advanced for this buying are: (1) Money more plentiful following harvest, (2) the practice by farmers of selling their wheat and replacing it with futures purchases, and (3) the general belief that wheat prices are too low, coupled with the particular but erroneous belief that because cash wheat sells higher on the average in the spring than in the fall futures should also;

to quit the market exceeds the willingness of others to fill the breach. Such a time is likely to appear with declining prices and when large commercial stocks of grain are on hand, especially if the market leaders among the speculative group are on the short side of the market. At such times the efforts of the smaller speculative longs may be an important contributing force in moving prices still lower. This factor is also likely to appear during the month prior to the delivery month of an expiring future, again growing out of the urge on the part of speculative longs to close out their positions. This latter setting is presented more fully in the section on The Delivery Problem. This indirect effect of hedging upon the price structure can be appropriately referred to as "hedge-position pressure" in contrast to the earlier type of "hedge selling pressure."

### RÉSUMÉ

Hedging is an important type of futures trading. The business is concentrated in the large elevator and processing companies located at central markets. The futures positions set up as hedges are predominately short, varying as a rule inversely with the changes in commercial supplies of grain. Following harvest the movement of grain to market is usually heavy. This requires large sales of futures as a hedge. So-called hedge pressure results and may well be a bearish force of considerable importance. It is difficult, however, to measure in terms of price due to post-harvest speculative buying flowing mainly from agricultural areas.

Hedge pressure may indirectly develop from the short positions which hedgers carry forward when speculators, anxious to close their long positions, offer to sell at progressively lower prices. This is especially likely as a delivery month approaches. Further development of this aspect of hedging is found in the section on The Delivery Problem.

### IMPORTANCE OF LARGE-SCALE SPECULATORS

The title to this section suggests that the trading of leading speculators has an important influence upon grain prices. As a preliminary to the testing of this hypothesis it is desirable to return again to some "first principles." Every futures contract requires at its inception a simultaneous, equal, and opposite purchase and sale; it requires during its lifetime coexistent, equal, and opposite long and short positions. This being true it follows that there is nothing in the nature of futures contracts as such suggesting an influence upon prices. Always being simultaneous and in perfect balance, the volume of purchases and sales and the size of open contracts should not, of themselves, have any effect upon prices. If, in the light of this fact, any association is found between volume and price or open contracts and price, it must be explained by evidence drawn from other sources.<sup>20</sup>

<sup>20</sup> That volume of trading and price are related in some manner was indicated in the section on the Broad Relation of Futures to Grain Prices where a direct correlation of +0.64 for wheat and +0.65 for corn was found. This result was obtained by comparing the monthly volume of trading and the monthly range of futures prices for the 15-year period, July 1923 to June 1933. Mehl has made a similar comparison for daily volume of trading in wheat futures with daily price range covering the years 1922-31, excluding the year 1925, in which a direct correlation of +0.80 was obtained. To obtain an even closer comparison he also correlated the total number of 16-cent price changes for each trading day with the daily volume of trading. For the years 1924-31, excluding the period from October 1 to November 14, 1925, and the year 1926 both regarded as abnormal, he obtained a correlation of  $r = +0.837$  (17).

## MARKET FORCES BROADLY CONSIDERED

The most immediate source available for examination is the manner in which trading is conducted. Here facts are provided which lend themselves to objective testing. Individuals do not all trade in the same way. Some execute their own trades, others use intermediary brokers; some buy and sell in small lots, others in large lots; some use "at-the-market" orders, others "limited" orders; some carry open speculative positions, others spreading speculative positions, still others hedging positions; some carry positions for relatively long periods of time, others for very short periods of time.

Assuming, however, that some measurable relationships were found between these techniques of trading and resulting volume and price activity, the inquiry still would not have reached to fundamental levels. These are concerned with the reasons underlying the various types of trading. Why do individuals trade? Why do some trade and others not? Why do some trade at certain times and not at other times? Why do different individuals use different methods of trading? These are questions difficult to answer mainly because of lack of objective facts. But they are fundamental to any inquiry into the reasons for grain prices.

Some evidence bearing on these questions was presented at earlier points in this study. Hedgers deal in futures to avoid loss from uncertain major price changes in their cash commitments and to profit from relative changes between cash and futures prices. Their motive as well as their methods of trade are fairly well understood. Not all cash commitments are hedged, partly because they are not suitable for hedging<sup>21</sup> and partly because the interests concerned prefer to speculate.

Speculators deal in futures because they see a possible profit from price changes. Those who do not trade evidently attach greater importance to the possibility of loss or they may not choose to trade on ethical grounds, or they may know little or nothing about futures, or they may not be able to finance a trade. The reasons why speculators see a possible profit from price changes are legion. But for purposes of analysis these may be broadly divided into two groups, namely, (1) those based upon fact or opinion<sup>22</sup> drawn from the cash-grain trade and (2) those based upon fact or opinion drawn from the mechanics of futures trading.

Our concern here is with the latter group. Within this group are to be found many forces important in their influence upon trading opinion and action. These range from such simple matters as the advice of a friend regarding the next turn of prices to the astrologer's long-range horoscope of highs and lows for the coming year. A wide variety of news and gossip inspired for its trading effect belongs in this same class.

Another important source of evidence is to be found in the various changes in market price. How speculator X may view 80-cent wheat depends a great deal upon how wheat prices have been performing in the immediate past. They may have been declining slowly or de-

<sup>21</sup> This is frequently true of products of grain having market values only loosely related to grain prices, also of sample grain, of grain having one or more special qualities, and of grain located far out of the main channels of shipment. It is also true of lots of grain too small to hedge effectively.

<sup>22</sup> The word "fact" is used here as elsewhere in this report to mean an item of knowledge of high probability. The word "opinion" (or "belief") is used in the broader sense of knowledge ranging all the way from well-established facts to mere guesses.

clining rapidly; they may have been advancing steadily or with intermittent set-backs. In the hands of the tape or chart reader these variations reveal elaborate formations sufficiently repetitive in character to serve as alluring though not necessarily safe guides to buying and selling policy. It may be seriously doubted whether any group of speculators is entirely free from the pervasive influence of price changes and this quite apart from any underlying reason or reasons for such changes. With respect to many speculators, they constitute the principal source of opinion regarding the future course of prices.

It is difficult to move much beyond the limits of general observation regarding these purely market forces. They are themselves subjective in character and can, for this reason, be only indirectly analyzed. In other words, what influences speculators to trade as they do must be inferred from the character and trading operations of the speculators themselves. The information currently received by the Commodity Exchange Administration is by no means comprehensive enough to make a complete analysis of these forces. Some idea of the number and variety of occupation of speculators is known. Some data bearing on these were cited in the section on the Broad Relation of Futures to Grain Prices. Some facts have also been cited regarding the manner in which the large hedgers operate and some facts are available regarding the manner in which the large speculators trade. For the much larger body of small traders very little direct information has been secured.

#### THE TRADING OF LARGE SPECULATORS

As pointed out earlier, the Commodity Exchange Administration receives daily the futures positions of each of the larger speculators. The regular reporting of these positions was begun in July 1923, and, with the exception of two periods when the reporting requirements were suspended by the Secretary of Agriculture, has continued up to the present time.

The reports received during these years have not, however, been of uniform content or quality. For certain periods the limit above which reports were required was 100,000 bushels; for several years it was 500,000 bushels; more recently it has been 200,000 bushels. The quality of these reports has also varied rather widely. Until recent years numerous legal and practical difficulties were encountered in the enforcement of the reporting requirements. For limited periods the dependableness as well as the scope of the reports was greatly improved under specific congressional authority. In the summary which follows of large-scale speculative activity, these facts should be held in mind.

#### THE JANUARY 2—APRIL 18, 1925, WHEAT INVESTIGATION

For the first year following the inauguration of special reports, grain prices were low and moved through comparatively narrow ranges. But during the summer and fall of 1924 a strong export demand, coupled with what was then thought to be a small world supply, resulted in wheat prices moving up materially. They had been around \$1.10 in June; by December they were up to \$1.80 per bushel. Furthermore the advance during these months was gradual and sustained, giving a perfect setting for widespread speculation. By the

end of January 1925, May wheat futures, Chicago, had passed the \$2.00 mark to become front page news. Prices declined during early February but recovered during the latter part of the month only to break widely during March, moving down over 50 cents per bushel. Widespread discontent developed not only among milling and cash-grain interests but also among consumer groups. As a result the Secretary of Agriculture, pursuant to a Senate resolution, ordered a special investigation of the trading during this period (19).

While the facts of this investigation brought out a number of points regarding the manner in which various market interests trade, one point appeared particularly important. This was the prominent position occupied by a few large speculators. Just how many speculators, large and small, were trading during this period is not known, but the number undoubtedly ran into the thousands. Of these only 302 reached a trading level of 100,000 bushels. When the market positions of these 302 were combined, however, they assumed rather large proportions, amounting to 32.8 percent of all long commitments and 12.8 percent of all short commitments. They also showed during this period substantial changes in their combined net position, suggesting the possibility that the operations of these larger speculators might be directly related to the course of prices.

Figure 18 shows the combined net position of these 302 speculators and the course of May wheat prices for this period. There is also shown the combined net position of the 8 largest of the 302 speculative accounts. These 8 traders represent all those who at some time during this period held a long or short position of at least 2,000,000 bushels. The importance of the 8 traders in determining the changes in position of the entire group is clearly shown. The remaining 294 traders accounted for an important fraction of the total position during most of the period, but the changes in their position were minor and random in character (19, fig. 15).

Two other observations can be made from figure 18. The first is that the general trend as well as the intermediate movements shown in the positions of the speculators are duplicated in fair measure by the course of prices. The second is that the changes in position during the first part of the period precede the changes in price. Thus the combined position of the 302 speculators reached a maximum on January 12 and the 8 largest on January 13. Prices continued upward, however, until January 28. Similarly a low point in speculative positions was reached on February 5 and in price on February 11. A second high in positions was reached on February 25 and in price on February 28. But during March and April this apparent discounting disappeared, major variations in price and positions occurring at approximately the same time.

Some light is thrown on the reason for these movements in the way in which smaller speculators traded during this period. Obviously if the leading speculators were sellers on balance from January 12 until February 5, either the smaller speculators or the hedgers or both were net buyers. Commission-house accounts, representing a mixed group of speculators with individual trades from 1,000 to 100,000 bushels, continued to buy up to January 30, and a residual group of "under-100,000-bushel" traders, representing mainly speculators but including some hedgers, continued to buy until February 5. The

larger hedgers were buyers throughout this period since they were closing out short commitments. The commission-house group became sellers after January 30, reaching a low point February 25. The "under-100,000-bushels" traders were also sellers after February 5. They continued to sell until February 28 (19, pp. 44, 49, and 51).

With reference to price, the "en masse" action of these groups suggests that the largest speculators foresaw lower prices as early as January 12 and accordingly sold while the smaller speculators con-

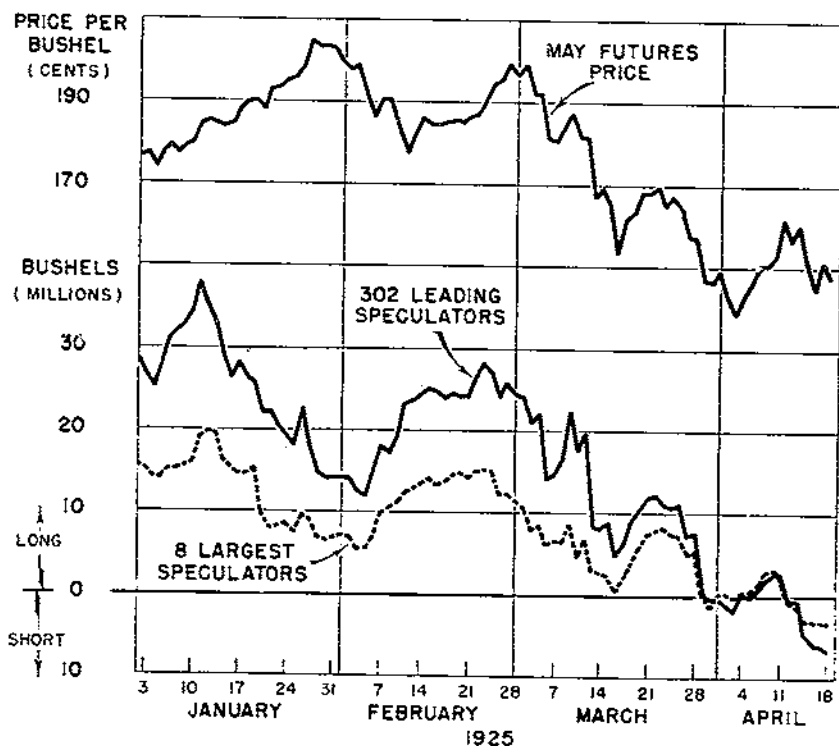


FIGURE 18.—The combined net position of 302 leading and of the 8 largest speculators in the 1925 May wheat future, compared with the closing price of the future, by days, January 2 to April 18, 1925.

tinued to buy until prices had declined materially (through February 5); that by the close of trading February 5 prices had declined sufficiently to appear attractive again to large speculators and accordingly they resumed buying, the smaller speculators being the sellers. After February 25 the leading speculators turned bearish again and became sellers with the smaller speculators buyers.

This interpretation is rather flattering to the composite judgment of the market leaders, but is fairly well in line with one school of thought regarding their superior ability to discount broad price movements. It leaves, however, much to be explained. Why should the smaller traders be willing to accommodate the leaders in this fashion? Why in particular was the turn in prices foreseen by the



leading speculators approximately 2 weeks in advance in January, 1 week in February, and not at all in March and April?

An approach to these questions is to be found in the unusual market conditions of this period. January was the seventh successive month of rapidly rising prices. Another advance of such proportions has not occurred in post-war wheat futures prices. It brought with it widespread speculation which, in the absence of an apparent upper limit to prices, was sufficient to continue the upward trend for a time despite liquidation by the leading speculators. This occurred in the latter part of January. But with continued liquidation on the part of the market leaders, prices receded materially in early February before public participation again became sufficient to check the decline.

On February 6 the leading traders became buyers again and once more bullish public enthusiasm was gradually built up. It was sufficient to maintain prices for a few days following February 25 when the leading speculators began to sell. It did not last as long this time, however, and once under way the smaller traders could be encouraged to buy, under the pressure of extreme large-scale selling, only at materially lower prices.

Admittedly this explanation is nothing more than an attempt to rationalize the forces at work during this period. It is believed, however, to be a fuller interpretation of the known objective events of the period than an explanation based only on discounting. As a matter of fact, the 13-year record compiled by the Commodity Exchange Administration, and its predecessor the Grain Futures Administration, does not disclose another case of apparent discounting as clear cut as this. The records disclose instead either concurrent price and large-scale position changes, such as occurred in March and April 1925, or an absence of any definite relationship.

Added insight into the character of large-scale trading can be secured from an examination of individual accounts. Five of the group of eight speculators shown in figure 18 made one or more daily net trades of at least 2,000,000 bushels during this period. How the market positions of these five traders varied from day to day is shown in figure 19 (19, *figs. 16-20*).

The positions which these individuals held and especially the changes in position which they made from time to time shed considerable light upon their trading policy. Traders 10, 9, and 5 were "bulls" hoping for higher prices. In this they were destined to be disappointed. Traders 12 and 14 were neither characteristically long nor short. They were "in-and-out" traders on a grand scale, each shifting his position from long to short and back again 11 times during this period. The attitude of these 2 traders may have been: "Are supply and demand conditions in this country and abroad such as to cause higher or lower prices?" to which an opposite answer was obtained every few days. Or it may have been: "Are trading conditions such as to cause higher or lower prices?" with a similar change of mind every few days. Because underlying supply and demand conditions do not display such frequent alternate changes, one is led to believe their interest centered mainly on market possibilities. Here a further question arises: "As an important part of the market, what effect, if any, will my own trading have upon the course of prices?"

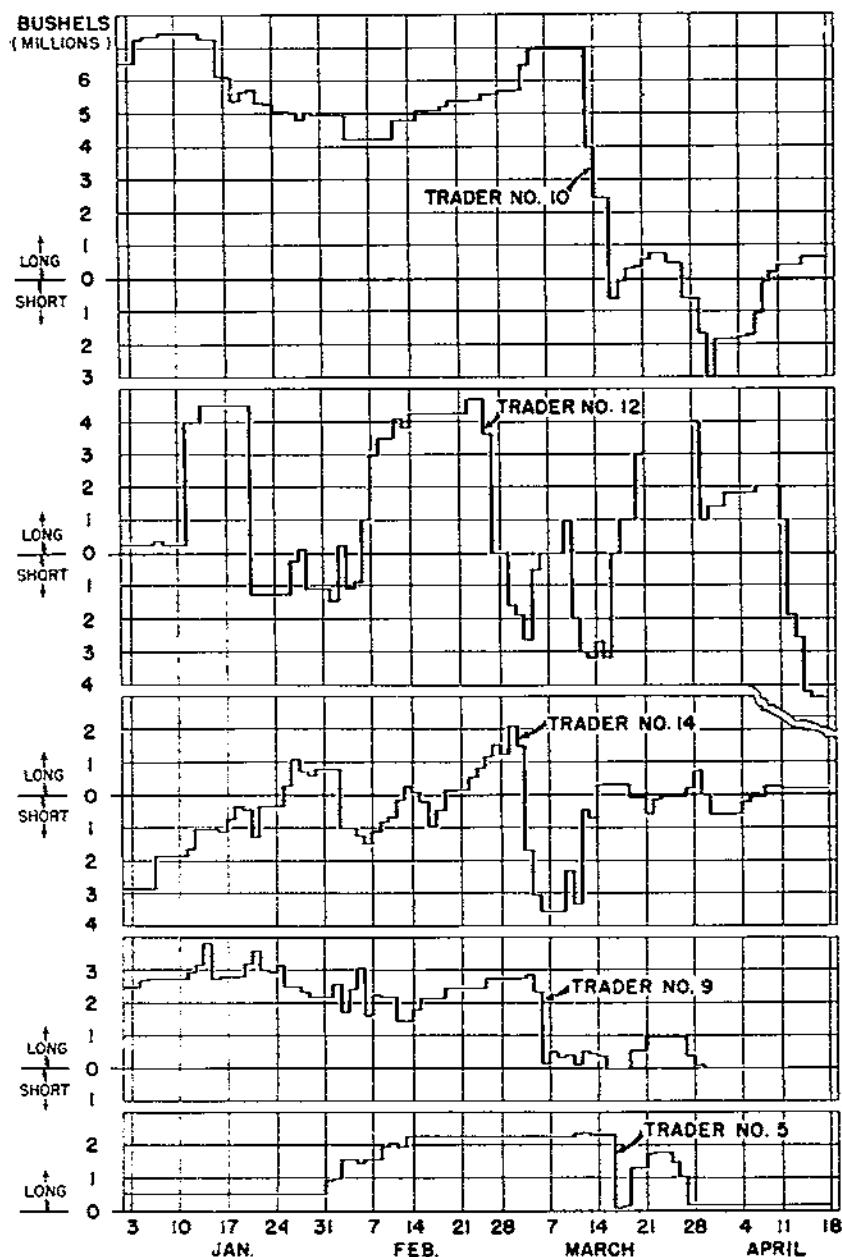


FIGURE 19.—The net position of 5 leading speculators in the 1925 May wheat future, by days, January 2 to April 18, 1925.

An incomplete but significant answer to this last question is to be found by comparing the net trading of each of these speculators with corresponding net changes in price. Here attention is immediately

drawn to the larger net trades and the larger net price changes. For this period these were as follows:

January 12, No. 12 bought 3,750,000 bushels, price advanced  $4\frac{1}{2}$  cents.  
 January 21, No. 12 sold 5,700,000 bushels, price declined 2 cents.  
 February 6, No. 12 bought 2,000,000 bushels, price declined 6 cents.  
 February 7, No. 12 bought 2,000,000 bushels, price advanced  $4\frac{1}{2}$  cents.  
 February 27, No. 12 sold 3,600,000 bushels, price advanced 1 cent.  
 March 4, No. 14 sold 3,200,000 bushels, price declined  $7\frac{1}{2}$  cents.  
 March 5, No. 12 bought 2,150,000 bushels, price advanced  $\frac{1}{2}$  cent.  
 March 6, No. 9 sold 2,200,000 bushels, price declined  $11\frac{1}{4}$  cents.  
 March 11, No. 12 sold 3,000,000 bushels, price declined  $5\frac{1}{4}$  cents.  
 March 12, No. 14 bought 2,900,000 bushels, price declined  $\frac{1}{2}$  cent.  
 March 13, No. 10 sold 3,000,000 bushels, price declined  $14\frac{1}{2}$  cents.  
 March 17, No. 10 sold 3,085,000 bushels, price declined  $11\frac{1}{2}$  cents.  
 March 17, No. 5 sold 2,240,000 bushels, price declined  $11\frac{1}{2}$  cents.  
 March 17, No. 12 bought 3,200,000 bushels, price declined  $11\frac{1}{4}$  cents.  
 March 20, No. 12 bought 2,000,000 bushels, price advanced  $4\frac{1}{2}$  cents.  
 March 30, No. 12 sold 3,000,000 bushels, price declined  $10\frac{1}{2}$  cents.  
 April 13, No. 12 sold 2,900,000 bushels, price declined  $5\frac{1}{2}$  cents.

These daily net trades are quite abnormal in size, being those which amounted to at least 2,000,000 bushels (19, p. 68).<sup>23</sup> They were accompanied by daily net price changes some of which were also very abnormal in size. While the ratio of net price changes to net trades was highly variable, the correspondence between the two was certainly more than mere chance. Price and trading in fact moved in the same direction on 12 of the 15 days cited. Furthermore they moved without apparent discounting. One is forced then to infer that these traders either currently foresaw on each of these days the price change likely to occur and acted accordingly or that their trading was an important factor in causing the change in price.

The weight of evidence is against the first of these possible inferences. If these traders anticipated a price advance or a price drop on each of these days, why did they not buy or sell a day earlier and thus take advantage of a more favorable situation? Is it reasonable to believe that they could foresee 20 minutes in advance of a price change but not 20 hours? But even here such intraday evidence as is available suggests that their foresight must have been measured in terms of seconds rather than minutes.

A second point against the forecasting inference is of broader import. Close comparison between the positions held by these speculators and the course of prices shows that four out of the five acted unwisely during this period. Since their sole objective was a profit this must mean that these four did not foresee the course of prices. They were guilty of what is popularly called "overstaying the market." A more rational view would appear to be that the size of their positions, and especially of Trader No. 10 was such that they could not avoid overstaying the market. Only Trader No. 12 was able to profit, and he did so in spite of the fact that most of his major trades were made with and not against the price movements of the day.

Considerable space has been given to this  $3\frac{1}{2}$ -month period in 1925 for the reason that it includes not only problems found in later periods but also some not encountered later, at least on the same scale. The period was one of unusually high and uncertain prices. It was a period of widespread public participation greatly dampened in the

<sup>23</sup> The term "net trade" is used in the technical sense of "change in market position from the close of one trading session to the close of the following." Especially for these large operators, it does not represent just one transaction but the net of all transactions made by the trader during a single session.

last month and a half by drastic price declines. Finally it included market leaders whose operations were counted in the millions. The facts reviewed suggest the following two inferences, to be checked by later experience:

1. That when the trading of market leaders results in large purchases or sales within comparatively brief periods of time, it is capable of causing the price to move with the trading—if purchases, upward; if sales, downward.

2. That the price effect of large-scale trading may be in part or wholly offset by small-scale trading if the latter is sufficiently vigorous and timely.

Since purchases and sales are not of themselves a cause, an explanation of these relationships must be found in the manner in which the trading is conducted. The orders of large traders are executed in the pit, by open outcry, and usually involve the use of one or more brokers. In these particulars they do not appear to differ from the many smaller orders being currently executed.

The filling of a large order involves, however, a succession of bids or offers, and these can be quite different in their price effect from the usual impact of random bids and offers. Assume, for example, that a market order to buy 500,000 bushels of May wheat is to be executed. A bid for 25,000 or 50,000 or even 100,000 bushels may be made. When this is filled the bidding continues for additional amounts. Unless at the same instant offers of equal amounts are available, the price must advance. If the bidding continues and prices do advance a general realignment of the market is likely to occur. The news spreads that one or more commission houses are buying. Rather shrewd guesses are made regarding the real source of the buying. Some may assume that the buying will continue and decide to ride with the price.<sup>24</sup> Some who were bearish when the price was at 95 may be bullish when it reaches 98. Many having selling prices in mind ranging from a quarter of a point to several points above the market may raise them as prices advance. Many others may sell short as prices advance, exhausting their financial capacity for further sales. Still others, who were not in the market at all before, may be attracted to it. Additional buying orders from the market leader may follow, causing further price advances and adding to the general uncertainty regarding how long such buying will continue. Or the advance may become sufficient to attract additional sellers more than willing to match all bids, and so the advance will cease.

It is possible in a setting of this kind for the market leader to close out his position without bringing the price down with him. One of two factors or both may come to his aid. Later developments in the cash-grain situation may prove prices to have been too low. Or market participation by the public may be in sufficient volume to support the price as he sells regardless of the cash-grain situation. This latter factor appears to have operated effectively for a short period in January and for a shorter one in February 1925. It is the exception rather than the rule, however, for either factor to prevent a reversal of prices if, in closing the position, only a short period of time is consumed.

<sup>24</sup> This is a characteristic of many professional pit traders, going long with price advances and short with price declines in the hope of being fortunate enough to close before a reversal of prices turns their paper profit into a loss (9).

## WHEAT: TRADING AND PRICES IN 1926

While somewhat less erratic, wheat prices continued high during 1925 and the early part of 1926. The volume of trading was large but declined with a lower level of prices during the latter part of 1926 (see figure 12). The Grain Futures Administration made two studies of trading in this period each of which supplements the findings of the earlier January 2-April 18, 1925 report (5 and 6).

The first of these studies was limited to a consideration of trading and prices on the Chicago Board of Trade in the 1926 May wheat future. This future was dominant (that is open contracts were larger in this future than in any other) from October 22, 1925, through April 29, 1926. There were eight speculators who, at one time or another during this period, held a position in May wheat of at least

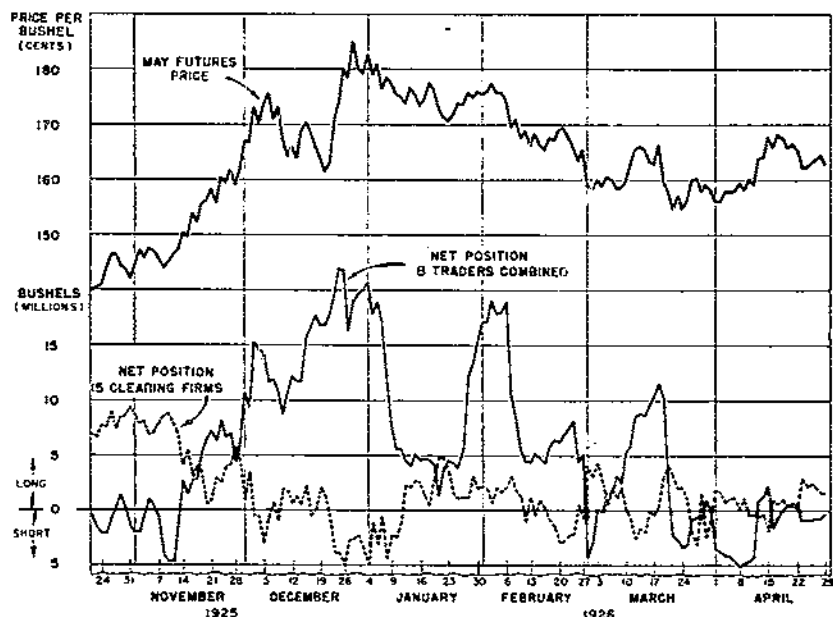


FIGURE 20.—The combined net position of 8 leading wheat speculators in the 1926 May wheat future compared with the closing price of the future and with the combined net position of the customers of 15 clearing firms, by days, October 22, 1925 to April 29, 1926.

2,000,000 bushels.<sup>25</sup> The combined net position of these eight is compared with the course of May wheat prices in figure 20. There is also shown in figure 20 the combined net position of 15 clearing firms whose customers were known to be small or medium-sized traders, mainly of the speculative type. For this particular period the linear correlation of the large-trader positions and price was  $+0.69$  (probable error  $\pm 0.03$ ) and for the small-trader positions and price  $-0.74$  (probable error  $\pm 0.02$ ).

These correlations appear too high to be the result of pure chance. During the first month of the period prices prevailed at about \$1.45.

<sup>25</sup> The same number of 2,000,000-bushel-or-more traders were found in the period in early 1925 though they were not the identical eight.

During this time the leading speculators as a group held no large commitments, but shifted from one side of the market to the other. Near the middle of November, however, prices began to advance. At the same time the large traders began buying heavily. With one important interruption this continued to the end of the calendar year. During the first 3 weeks of January prices receded somewhat with very substantial liquidation by market leaders. The latter again bought heavily during the last week of January with, however, only a moderate price advance. They quickly liquidated in early February. In March substantial purchases were again made and promptly liquidated.

There is no reason to believe that the price-position relationships shown for this period differ fundamentally from those of the earlier period in 1925. If the inferences drawn there were sound they are further confirmed here. One minor point of difference should be noted, however. Liquidation by leading traders beginning December 4 and again December 26 was followed by a lowering of prices beginning December 8 and December 30, respectively. Here, as in the earlier period, public support was sufficient to permit partial liquidation but instead of 1 to 2 weeks, only 4 days were allowed. For the remainder of the period price changes did not lag behind important changes in leading trader positions.

The inverse relation of the small-trader positions to price is to be expected in view of the positive correlation of the leading traders. If the leading speculators cannot enter and leave the market quickly by dealing with hedgers, then the small speculators must sell when the large speculators buy, and buy when the latter sell.<sup>28</sup> It is worth observing, however, that this mode of trading by the public is quite contrary to popular belief regarding the role of small traders. They are popularly supposed to buy as the market advances, only to be forced out at the first substantial break in prices. Many small traders do act in this manner; but there are many more who act in opposite fashion with the net result that, as a group, sales exceed purchases as prices advance and purchases exceed sales as prices decline.

A similar analysis of trader-price relationships was made for the 8-month period, April 30 to December 31, 1926 (6). There were five speculators who held 2,000,000-bushel-or-more positions at some time during this period. The combined net position of these five, all wheat futures combined, Chicago Board of Trade, is shown in figure 21.

Their position, together with that of 15 clearing firms having small- or medium-sized traders as customers, is compared with closing futures prices for this 202-day period.

Here again the large-trader positions and prices show a direct correspondence ( $r=+0.72$ ), while the small-trader positions and prices show an inverse one ( $r=-0.83$ ). Prices during this period were fairly high but free from the unusual price movements of earlier months. Public participation had declined somewhat. In this setting the leading speculators were less able than before to get in or out of the market without an immediate response in price. This is shown

<sup>28</sup> For similar evidence in the stock market see the reports of the Securities and Exchange Commission on the buying and selling of odd-lot dealers on the New York Stock Exchange.

in figure 21 by the absence of any lag in prices following large-trader position changes.

Despite this fact the urge to trade still ran rather strong among a few market leaders. The 5 largest traders made 222 daily net trades of at least 500,000 bushels each during this period, trader A making 62; trader B, 64; trader C, 58; trader D, 26; and trader E, 12. These trades were further distributed in point of time. On certain days, 1 trader bought or sold; on other days, another; on still others, 2 or

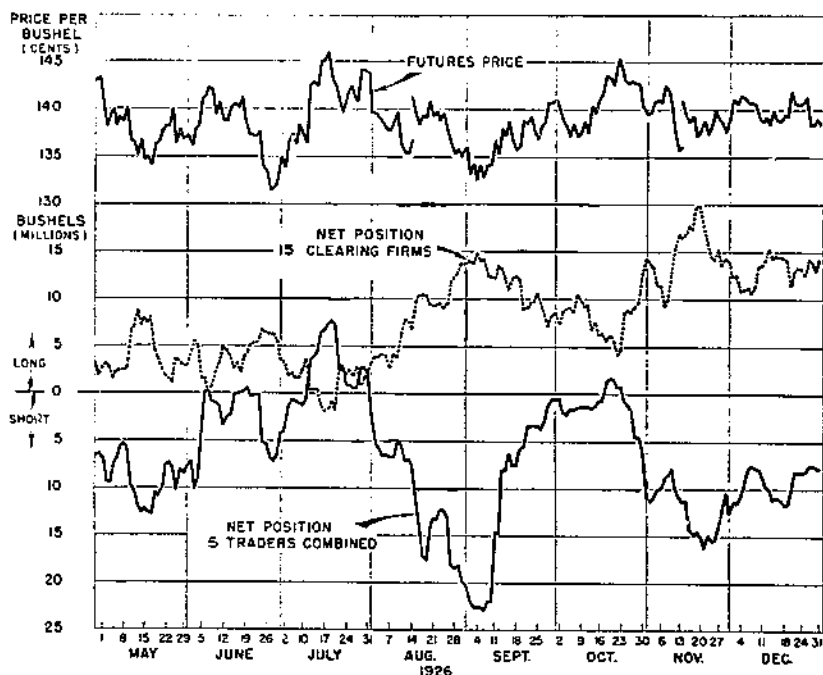


FIGURE 21.—The combined net position of 5 leading wheat speculators, all futures combined, compared with the closing price of the dominant future and the combined net position of the customers of 15 clearing firms, by days, April 30 to December 31, 1926.

more traded, sometimes in the same and sometimes in opposite manner.

An examination of the distribution of these individual net trades and positions over this period does not disclose that they were made in concert. Nor does the record of any one of the five disclose any close correspondence of positions to price or net trades to net price changes. Yet when combined and considered as a group their positions as well as their large trades reveal a pronounced price relationship. They suggest in even stronger terms than for earlier periods that the trading of these leaders caused prices to move with their trading. To believe otherwise is to attribute to these few traders a measure of market insight far superior to the combined forecasting ability of all other traders; that somehow this power of prophecy is passed about from trader to trader as each chooses to trade; that as a rule it reveals itself only at the instant his trades

are made; and finally, that it will take effect only if the trades are large.

In table 6 are shown the net trades of leading speculators during the 2-year period, January 2, 1925 to December 31, 1926. This table brings together all of the large speculative trades made in wheat futures on the Chicago Board of Trade during this period (19, table 15, 5, table 5, and 6, tables 6 and 7). These individual trades were first classified by the days on which they were made and where two or more occurred on the same day their net amount determined. These net amounts were then compared with the corresponding net price changes for each day in which the net amounted to 500,000 bushels or more. Table 6 shows in cumulative form the degree to which the net trades and the corresponding net price changes moved in the same direction: If a purchase, an advance in price; if a sale, a decline in price.

TABLE 6.—Number of days on which the net of individual purchases and sales of 500,000 bushels or more and the futures price moved in the same direction, for leading wheat speculators, all futures combined,<sup>1</sup> Jan. 2, 1925, to Dec. 31, 1926

Net of purchases and sales (bushels)	Jan. 2 to Apr. 18, 1925			Apr. 19, 1925, to May 29, 1926			June 1 to Dec. 31, 1926			Entire 2-year period, Jan. 2, 1925, to Dec. 31, 1926		
	Total number of days	Number in same direction	Percent in same direction	Total number of days	Number in same direction	Percent in same direction	Total number of days	Number in same direction	Percent in same direction	Total number of days	Number in same direction	Percent in same direction
500,000 or more.....	61	37	61	216	156	71	94	64	68	374	257	69
1,000,000 or more.....	41	26	63	154	119	77	56	44	79	251	189	75
2,000,000 or more.....	22	17	77	75	62	83	28	24	86	125	103	82
3,000,000 or more.....	13	11	85	36	31	86	15	13	87	64	55	86
4,000,000 or more.....	8	7	87	22	19	86	8	6	100	38	34	89
5,000,000 or more.....	4	4	100	14	12	86	5	5	100	23	21	91
6,000,000 or more.....	—	—	—	9	8	89	2	2	100	11	10	91
7,000,000 or more.....	—	—	—	4	4	100	1	1	100	5	5	100
8,000,000 or more.....	—	—	—	3	3	100	—	—	—	3	3	100
9,000,000 or more.....	—	—	—	1	1	100	—	—	—	1	1	100

<sup>1</sup> For the period Jan. 2 to Apr. 18, 1925, only the 1925 May wheat future was used. For this particular period of the crop year, however, practically all the large individual trades were in the May future.

For each of the three periods the results are approximately the same. While the degree of correspondence between trading and price is by no means perfect it is too high and too consistent to be a matter of mere chance. Especially is this true of the larger net trades. It is only necessary to observe that the table offers additional support to the inference already drawn namely, that large-scale trading by market leaders executed in comparatively brief periods of time is capable of directly influencing prices.

#### OTHER SURVEYS

There have been later studies, some published and some unpublished, of the effect of large-scale trading. While these have shown similar results to those just reviewed the relationships shown have not been as striking. This has been due in part to the unusual supply and demand and price conditions in 1925 and 1926, conditions which have not been repeated in quite the same proportions since. In part,



later studies have shown less significant results due to fewer large-scale trades and traders. Especially has this been true following 1929 when the fortunes and trading enthusiasm of a good many market leaders were materially reduced. Space will not permit more than a citation of these studies to which those desiring a broader survey are referred.

In response to a Senate resolution, the Grain Futures Administration made a special survey of futures trading on four leading grain exchanges covering the period January 3 to October 31, 1927 (17). In this survey the relation of large-scale speculation and price was again analyzed, this time for corn as well as wheat. There were 7 speculators in wheat and 13 in corn whose positions reached a 2,000,000-bushel level in some one future, Chicago Board of Trade, during this period. As in earlier periods these market leaders were in the market for varying periods of time. They chose to trade from day to day in widely varying amounts. Table 7, compiled in the same manner as table 6 (p. 53), shows the relation between the outstanding daily trades of these leading speculators and corresponding net price changes.

TABLE 7.—Number of days on which the net of individual purchases and sales of 500,000 bushels or more and the futures price moved in the same direction, for leading wheat and corn speculators, all futures combined, January 3 to October 31, 1927

Net of purchases and sales (bushels)	Wheat			Corn		
	Total number of days	Number in same direction	Percent in same direction	Total number of days	Number in same direction	Percent in same direction
500,000 or more.....	118	62	53	108	71	66
1,000,000 or more.....	53	36	68	46	36	78
2,000,000 or more.....	23	17	74	15	12	80
3,000,000 or more.....	10	9	90	5	4	80
4,000,000 or more.....	6	6	100	2	2	100
5,000,000 or more.....	1	1	100	1	1	100

The totals of table 7 point to the same inference as that drawn for earlier periods. However, the proportion of concurrence for wheat was not as high as for earlier periods, suggesting that the net of individual trades must reach at least a 2,000,000-bushel level in order to have any very dependable effect upon the movement of prices. Figures 22 and 23 show the combined net positions held by these leading speculators in wheat and corn during this period, together with the course of futures prices.

Further analysis of trading by leading speculators is to be found in a study of corn futures published by the Grain Futures Administration in 1930 (7). In this survey the 4-year period October 1924-September 1928 was considered. Seventeen speculators built up futures lines of 2,000,000 bushels or more, Chicago Board of Trade, at some time during this period. As in the previous studies for wheat, these leading speculators were in and out of the market during varying periods of time. Their daily net trades also ranged from small to very large amounts.

Table 8 presents a summary of the daily net purchases and sales of these 17 traders for this 4-year period (7, table 11). It is built up in the same manner as earlier tables of net trading and price and shows the same general relationship: A direct relationship between trading and price change, increasing as the size of the net trades

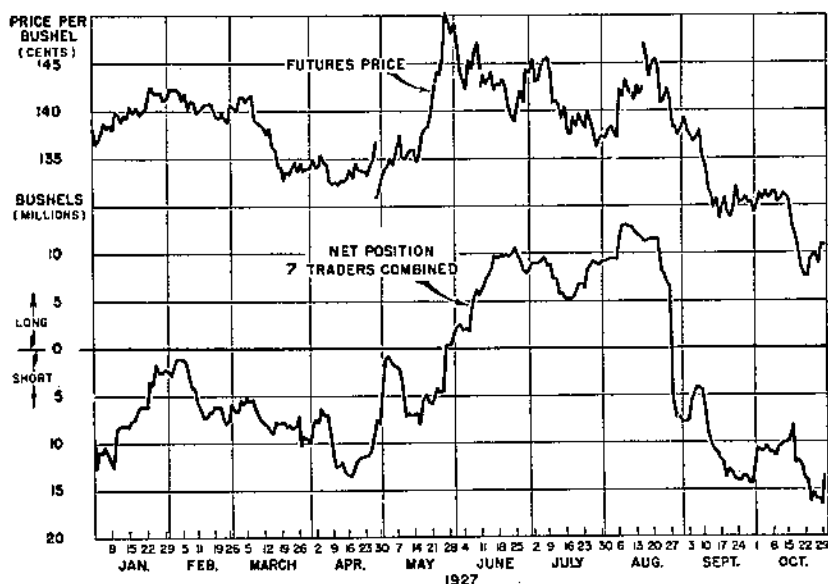


FIGURE 22.—Wheat: The combined net position of seven leading speculators compared with the closing price of the dominant future, by days, January 3 to October 31, 1927.

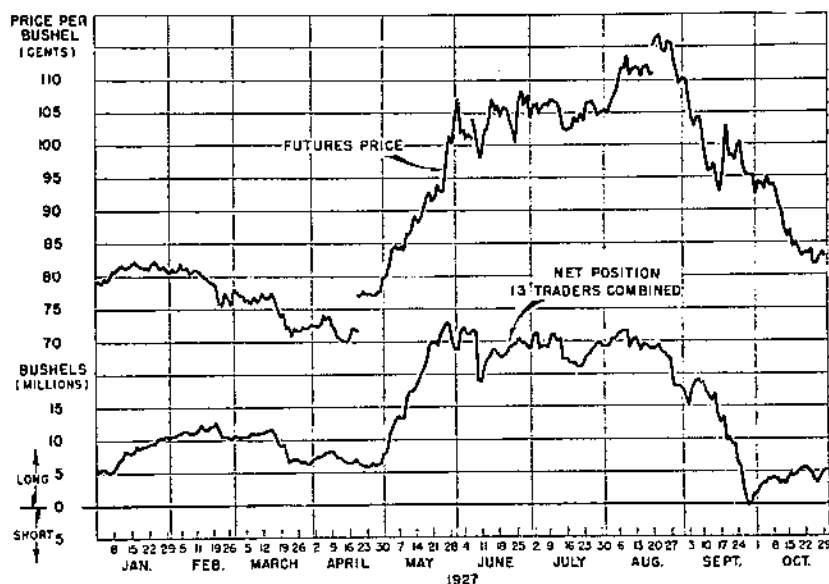


FIGURE 23.—Corn: The combined net position of 13 leading speculators compared with the closing price of the dominant future, by days, January 3 to October 31, 1927.

increase. The degree of correspondence, however, is not quite so high as that shown in table 6 for wheat nor in table 7 for corn.

Leading-trader activity during this 4-year period centered mainly in the last 2 years. During the first 2 crop years large speculative

lines were few in number with the result that, when combined, their net position showed little or no correspondence to the course of prices. But in 1926-27 and again in 1927-28 the positions of leading traders increased greatly, and with this increase there developed a direct relationship between their position and price. This fact is shown in figure 24 where the combined net position of 16 leading speculators

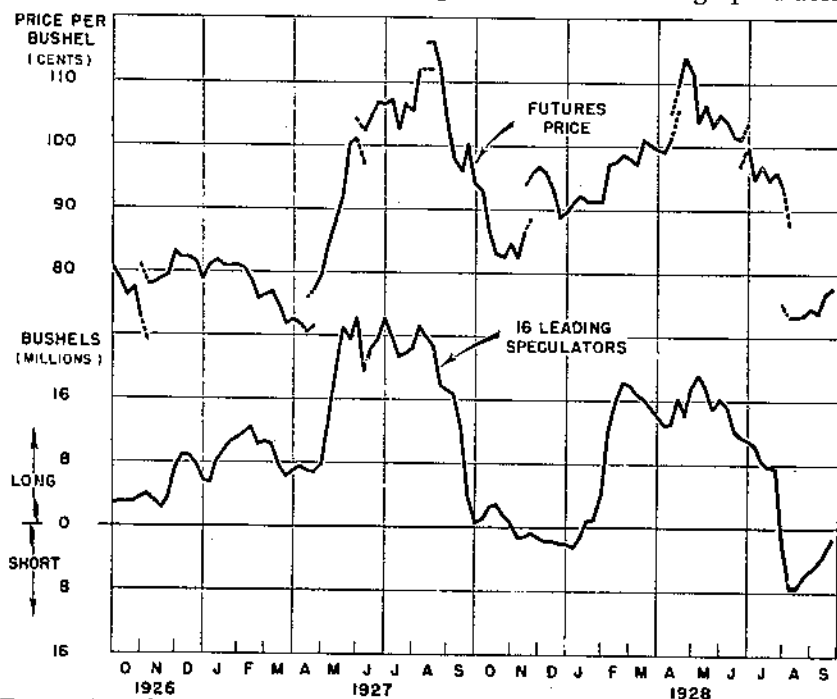


FIGURE 24.—Corn futures: The combined net position of 16 leading speculators compared with the dominant futures price, by weeks, Chicago Board of Trade, October 1926 to September 1928.

is compared with the course of corn futures prices. Because of the length of time included in figure 24, positions and prices are shown only for one date each week instead of daily. There is sufficient detail, however, to show the broad course of large-scale speculative positions and its relation to the course of prices.

TABLE 8.—Days on which the net of individual purchases and sales of 500,000 bushels or more and the futures price moved in the same direction, for 17 leading corn speculators, all futures combined, October 1, 1924, to September 30, 1928

Net of purchases and sales (bushels)	Total number of days	Days on which price and net of purchases and sales moved			
		In the same direction		In opposite direction	
		Number	Percent	Number	Percent
500,000 or more.....	288	178	61	112	39
1,000,000 or more.....	123	86	70	37	30
2,000,000 or more.....	32	23	72	9	28
3,000,000 or more.....	10	9	90	1	10
4,000,000 or more.....	4	4	100	0	0
5,000,000 or more.....	2	2	100	0	0
6,000,000 or more.....	2	2	100	0	0
7,000,000 or more.....	2	2	100	0	0

## THREE RECENT CROP YEARS

How leading speculative positions and prices have moved in recent years is shown in figures 25 and 26. Figure 25 shows positions and prices in wheat futures during the crop years 1935-36, 1936-37, and 1937-38.<sup>27</sup> Figure 26 is a similar comparison for corn for the crop years 1934-35, 1935-36, and 1936-37.<sup>28</sup>

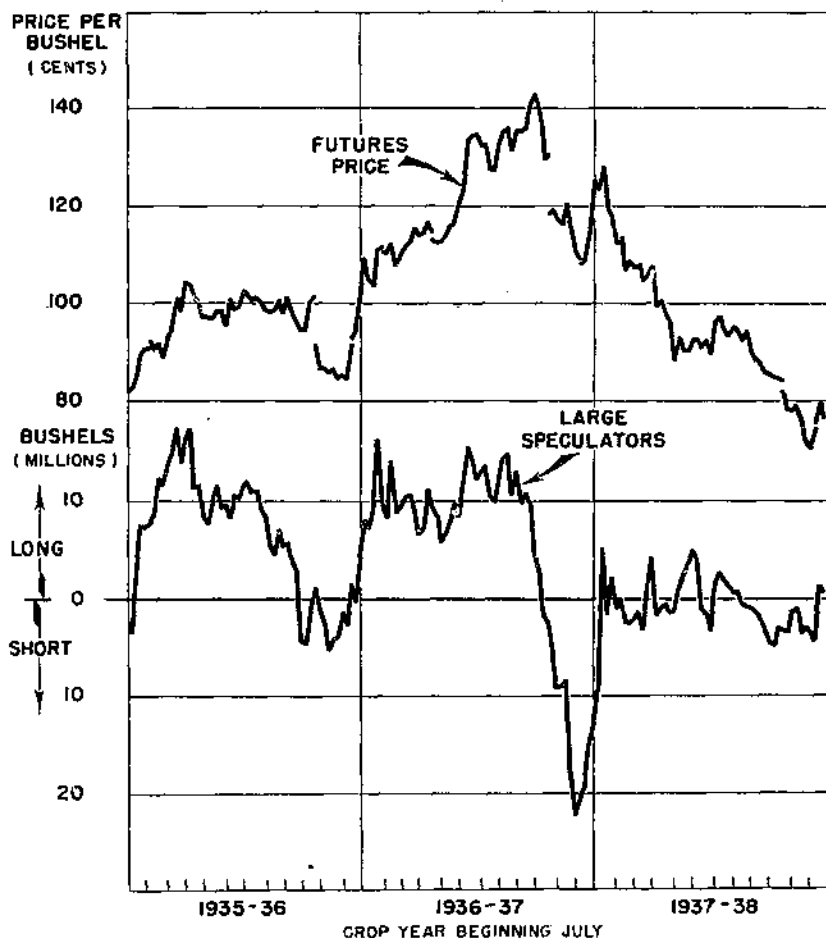


FIGURE 25.—Wheat: Combined net position of leading speculators, Chicago Board of Trade, compared with the average closing price of the dominant future, end of each week, July 5, 1935 to June 24, 1938.

During these 3-year periods for both wheat and corn there were very few speculators who held positions of at least 500,000 bushels—the standard used to classify large-scale speculators in earlier studies. For this reason there are included in the “large speculator” group traders having positions of 200,000 bushels or more. They were the leading speculators during this period but they were of an order considerably

<sup>27</sup> See Appendix, table 11.

<sup>28</sup> See Appendix, table 12.

smaller than for former years. The data of figures 25 and 26 represent positions and prices as of one date each week. The charts show how these positions and prices changed from week to week over this period but do not show day-to-day variations.

With respect to wheat, the large-speculator positions show a significant though not a high correlation with futures prices. In the fall of

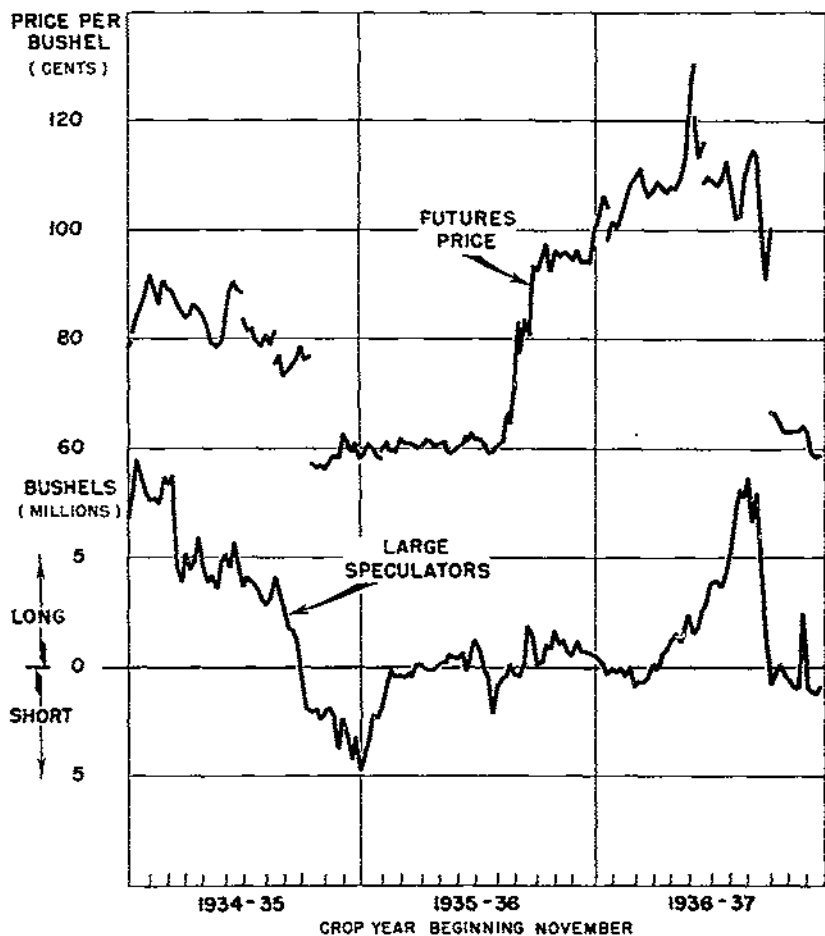


FIGURE 26.—Corn: Combined net position of leading speculators, Chicago Board of Trade, compared with the average closing price of the dominant future, end of each week, November 2, 1934, to October 22, 1937.

1935 positions and prices advanced, the former from 2 million short to 17 million bushels long and the latter from 82 cents to \$1.04 per bushel. From October 1935 through 1936 positions and prices declined irregularly to about their former levels. During June and July 1936 both advanced rapidly. From July 1936 through March 1937 prices moved irregularly upward. The positions of leading speculators during this period did not increase though they do show some correspondence in minor variations. From April to July 1937 prices and positions moved

downward and then partially recovered. During 1937-38 prices declined materially and positions moved irregularly.

Considerably less correspondence between positions and price is shown in figure 26 for corn. The period begins in November 1934—a year of small crop but fairly large carry-over. By December of that year prices had reached 90 cents per bushel, the highest figure in 4 years.<sup>29</sup> Thereafter they declined until a level of 60 cents was reached for new crop futures in October 1935. The combined position of leading speculators also declined during this period from a long position of approximately 8 million bushels to a short position of 4 million. From October 1935 through May 1936 prices continued around 60 cents per bushel, with the combined position of leading speculators returning to an even position.

In the summer of 1936 drought again forced prices upward to reach, in April 1937, a level of \$1.30 per bushel. During most of this period the combined position of leading speculators was small. Especially noteworthy is the fact that in July 1936 corn prices rose 30 cents per bushel while the leading speculators bought only 2 million bushels of corn futures, shifting their position from net short  $\frac{1}{2}$  million to net long  $1\frac{1}{2}$  million. The period illustrates well the fact that prices can and do move from time to time independently of the force of large-scale trading.

In February 1937 the leading speculators began buying to acquire by early July of that year a net long position above 8 million bushels. Figure 26 does not suggest that this buying did much to advance prices. Instead it appears to have supported prices during May, June, and the fore part of July against an oncoming crop that pointed to much lower prices. In late July this support was withdrawn. Further reference to this period is made in the following section where the delivery problem is considered.

### RÉSUMÉ

Speculators trade because they believe there is a possible profit to be obtained. Their trading is based either upon (1) fact or opinion drawn from the cash-grain trade or (2) fact or opinion drawn from the mechanics of futures trading. The influence of the cash-grain trade was considered in the section on the cash situation; the influence of the futures system has been considered in this section.

Reports regularly received by the Commodity Exchange Administration (and its predecessor, the Grain Futures Administration) during the past 15 years reveal a wide distribution of speculative interest ranging from a very few speculative giants to a large number of very small traders. A comparison of the net trading and net positions of these speculators with the course of futures prices suggests the following two inferences:

1. That when the trading of market leaders results in large purchases or sales within comparatively brief periods of time, it is capable of causing the price to move with the trading—if purchases, upward; if sales, downward.

2. That the price effect of large-scale trading may be in part or wholly offset by small-scale trading if the latter is sufficiently vigorous and timely.

<sup>29</sup> *Supra.*, figure 13.

In addition to these two general inferences, certain supplemental observations can be made from the information presented in this section. One is that the larger the daily net trades by leading operators the more certain it becomes that the price will respond directly to the trading. The influence of large-scale trading upon price makes it reasonable to believe that these market leaders operate to some extent on the theory that their trading and positions will so affect the opinions and trading of others that a profit will result. There is, however, very little evidence that they act in unison or that their theory of trading is in practice very successful.

To the small traders goes the privilege of buying as the large traders sell and selling as the latter buy. Their theory seems to be "Buy on breaks, sell on bulges." Whether in following this time-honored saw a profit or loss for the group results is not definitely known. As individuals, some profit, some lose; all pay commissions for the privilege of trading.

### THE DELIVERY PROBLEM

The conditions surrounding the delivery of grain upon futures contracts have at times an important bearing upon the course of prices. Under the terms of the futures contract every buyer of futures has a right to demand delivery and every seller has a right to make delivery of actual grain. It is true that most contracts are satisfied by offset rather than actual delivery. But this fact does not exclude the right to make or take delivery and this right or privilege can, at times, influence the opinions and actions of traders to result in a very marked movement of prices. At such times the market is said to be "congested."

Such congested situations are likely to occur when deliverable supplies are small relative to the demands of traders to meet their contract obligations. Years of small carry-over and below-average production present a natural setting for difficulties during the last weeks of a maturing future. At such times, unusual delivery demands on the part of buyers may cause considerable bidding up of prices by short sellers. In these circumstances, the short sellers are said to be "squeezed." If the situation becomes still more acute the short sellers are said to be "cornered."

Two supplementary aspects to this general setting should be observed. The first is that a small deliverable supply may not of itself encourage either a corner or a squeeze since the volume of maturing futures contracts may be so small that it creates no threat of unusual delivery demands. Even if maturing contracts are large relative to the deliverable supply no squeeze or corner will occur so long as the belief is general that the bulk of these contracts will be gradually offset before the close of the delivery period. This leads to the second corollary, namely, that a corner or squeeze can occur in the presence of a relatively large deliverable supply where open futures commitments are much larger and the belief widespread that the buyers are going to stand for delivery. The delivery problem, therefore, is fundamentally one of providing conditions which will assure fulfillment of maturing futures contracts either by offset or delivery and without causing price disturbances.

## RELATIVE FUTURES PRICES AT TIME OF DELIVERY

Figures 27 and 28 show the normal as well as the abnormal among maturing futures prices during the 15-year period, July 1923-June 1938. Figure 27 shows the four leading wheat futures for each of the 15 years, figure 28 the four leading corn futures for the same years.

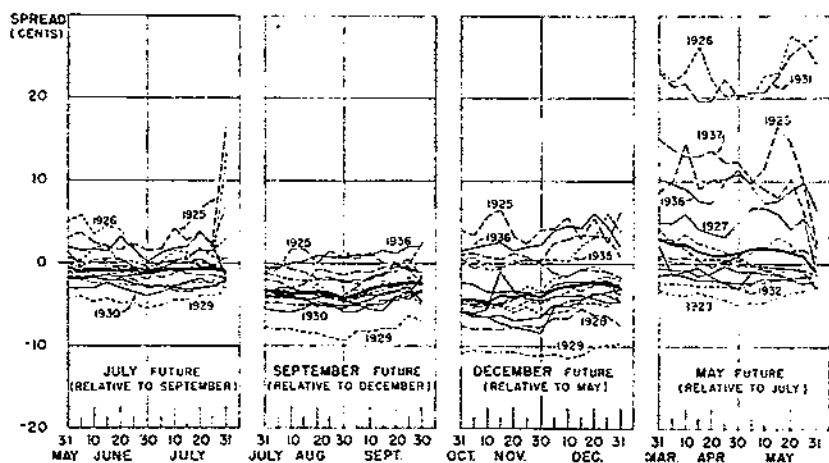


FIGURE 27.—Wheat: Premiums or discounts of maturing futures relative to the next succeeding future, using closing prices for selected dates, July 1923 to May 1938.

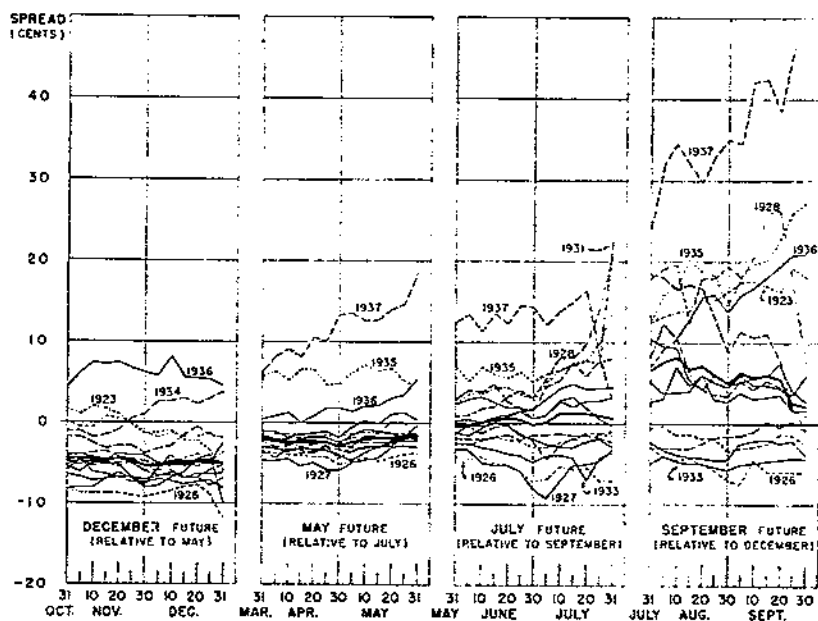


FIGURE 28.—Corn: Premiums or discounts of maturing futures relative to the next succeeding future, using closing prices for selected dates, July 1923 to May 1938.



Each price series shows the extent to which the current future was above (+) or below (—) the next maturing future for 13 5-day periods ending the last trading day of the current future.<sup>30</sup> So set up it is possible to observe not only the relative level of maturing futures prices but also any unusual upward or downward trend. It should be observed, however, that the use of the next succeeding future as a base is not altogether satisfactory since, to some extent at least, it reflects the delivery elements affecting the current future and in addition may reflect other elements not common to the two futures.

#### NORMAL PRICE RELATIONSHIPS

A summary observation of figures 27 and 28 shows that many of the futures follow a common pattern from year to year. Especially is this true of wheat for the July, September, and December futures relative to the next succeeding future and for corn for the December and the May futures relative to the following futures. An average of this common pattern is shown as a heavy curve for each of the four futures of each grain.<sup>31</sup> Because of the wide scatter between futures, the averages for May wheat (relative to July) and for September corn (relative to December) are less significant than for other futures.

Judging from this 15-year sample for wheat, the July future appears to occupy an intermediate status between the old-crop May future and the new-crop September future. It displays a discount or carrying charge of about 1 cent per bushel which suggests a new-crop future but with supplies still relatively scarce. Both the September and the December futures show substantial discounts under succeeding futures reflecting a normal situation of ample commercial supplies in store. The May future is typically one of premium over the July, showing the end-of-crop year scarcity of supplies.

With respect to corn, each future from the December to the following September was progressively higher in price as compared with the next succeeding future. The December is distinctly a discount future; so also is the May but to a smaller amount. In contrast the July leans a little toward a premium future during the latter part of the month of June and during the month of July. The September future is distinctly a premium month.

#### ABNORMAL PRICE RELATIONSHIPS

These lines of normal relationship are useful not only in showing the price relationships to expect in the absence of any unusual or disturbing delivery situations but also in providing a base from which to measure the extent of price disturbance in years of unusual delivery conditions. Certain of these expiring futures depart conspicuously from the average of the group.

Thus for wheat, the 1925 July and the 1926 July advanced abruptly during the closing days of the future. The 1926 May and the 1931

<sup>30</sup> Thus the 1926 July wheat future closed on May 31 of that year at \$1.37½ and the 1926 September wheat future at \$1.32¼. As of the close on that day the July was 5 cents above the September. This 5-cent premium is shown in figure 27 as +5. Similarly, as of the close on June 5 the July was found to be 5½ cents above, showing an advance in the July relative to the September of ½ cent per bushel during the period May 31-June 5. Other relative prices are shown to the last trading day of the current future.

<sup>31</sup> The mean of the five central items of each algebraic array was chosen as most nearly representative after comparison of the means of the nine, seven, five, and three central items together with the median (10, p. 27 ff. and appendix, table 13).

May prevailed at high premiums throughout the closing weeks of the future. At the lower extreme are the 1929 September and the 1929 December futures. These show abnormally large discounts.

The various corn futures also reveal abnormal maturities for certain years. Thus the 1936 December was rather high in view of the fact that this future normally prevails at a discount. This was followed by an abnormal 1937 May and, to a somewhat lesser extent, by an abnormal 1937 July. Other unusual situations in July futures occurred in 1928 and 1931. Among the September futures the 1937 exceeded all others by a wide margin though the 1935 future was high, also the 1936, the 1928, and the 1923. The September futures are in fact characterized more by abnormal than by normal years. In addition to the years of unusual premium, just mentioned, there have also been years of relatively large discounts, namely, in 1926 and 1927, and in 1933 and 1934. Like the year 1929 for wheat, these were years of large supplies in store, encouraging those with storage space to make additional commitments only at liberal discounts. In contrast, years of large premiums have usually been years when supplies were small.

### THE INFLUENCE OF DELIVERABLE SUPPLIES

Figures 29 and 30 show in a general way the importance of supplies to the delivery problem. As pointed out at the beginning of this section, when supplies appear inadequate to meet maturing futures

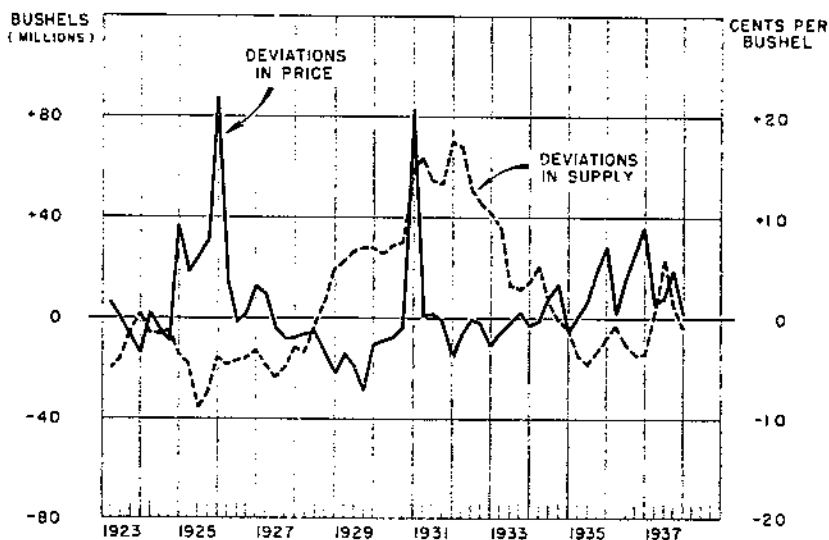


FIGURE 29.—Wheat: Deviations from normal deliverable supply compared with deviations of the current futures price from the next succeeding futures price, for the last 2 months of the May, July, September, and December futures, Chicago Board of Trade, July 1923 to May 1938.

contracts they can easily create uncertainty in the minds of traders which uncertainty is in turn reflected in the price structure. To measure this factor objectively one should include only that portion of total supplies which may reasonably be regarded as available for actual delivery. This is a quantity not easily determined. Among

other things one cannot be sure how far grain will be shipped in the event of extreme prices or extreme necessity, what quantities may be hidden at country points, what grades in store fall outside permissible delivery grades, or what quantities in store are held by hands unable or unwilling to release them.

The deliverable-supply curves shown in figures 29 and 30 are subject to these limitations. They show for wheat and corn total supplies in public and private store at the following 12 points: Chicago, Milwaukee, Cincinnati, Indianapolis, Louisville, Nashville, Peoria, St. Louis, Kansas City, Omaha, St. Joseph, and Sioux City.<sup>32</sup> They do not include supplies at Buffalo, Duluth, and Minneapolis, which in extreme cases have been known to move to Chicago in appreciable amounts. They do not include supplies at more distant points, not-

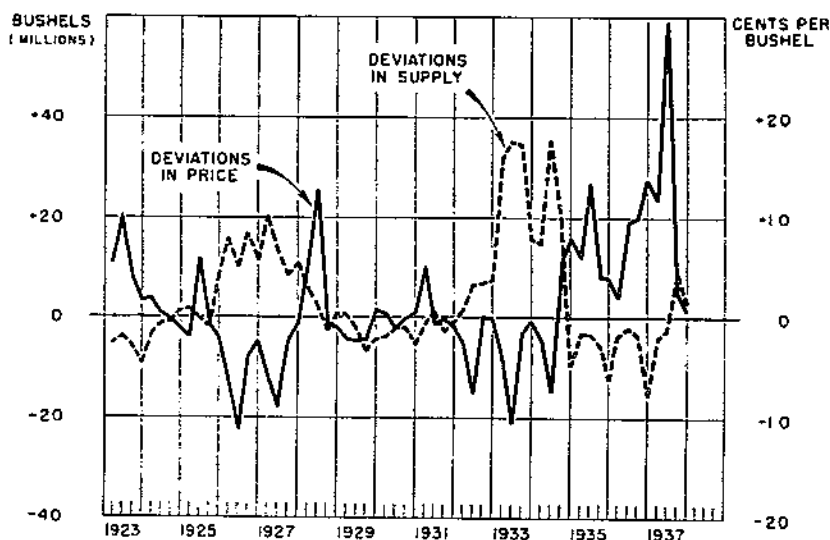


FIGURE 30.—Corn: Deviations from normal deliverable supply compared with deviations of the current futures price from the next succeeding futures price, for the last 2 months of the May, July, September, and December futures, Chicago Board of Trade, July 1923 to May 1938.

ably on the seaboard, nor supplies at many smaller interior markets and on farms. Each point on the supply curve represents the extent to which the supply during the delivery month for that year deviated from the normal for that month for the 15-year period.<sup>33</sup> Each point on the price curve represents the extent to which the average premium or discount of the expiring future (relative to the next succeeding future) deviated from the normal for that future for the 15-year period.<sup>34</sup>

<sup>32</sup> See Appendix, table 14.

<sup>33</sup> Thus for wheat for May of each of the 15 years, supplies at the 12 points were totaled for the last Saturday in April and the last Saturday in May and the 2 totals averaged. The 15 supply figures were then arrayed according to size and the mean of the 5 central items calculated. Deviations for each individual year from this mean were then calculated. The same procedure was followed for July, September, and December for both wheat and corn.

<sup>34</sup> See Appendix, table 14. Deviations in price shown in figures 29 and 30 are the net (algebraic) differences obtained by subtracting the average spread of each future from the 15-year mean.

## WHEAT

With respect to wheat (fig. 29), two periods of relative scarcity in supplies are shown. The first of these began with the 1925 May future and continued through the 1928 July future. The second period was less severe, continuing from the 1935 July future through the 1937 May future. These periods of relative scarcity appear to account in part at least for some of the unusual premiums in current futures prices. Beginning with the 1925 May, the near futures continued relatively high for more than a year, with the 1926 May at an extreme level. Similarly, certain of the expiring futures during the 1935-37 period show relatively high premiums.

During the years 1929-32 wheat supplies were quite large and with one outstanding exception this was a period of relatively low prices for expiring futures. The outstanding exception was the 1931 May when prices in that future were "pegged" through the efforts of the Federal Farm Board. To some extent, though how much it is hard to say, other expiring futures were also affected by Farm Board operations within this period. Broadly viewed deliverable supplies through all these years appear as an important, though by no means the sole, factor in determining the relative level of expiring futures prices.

## CORN

The observation just made with respect to wheat applies with about the same force to corn. There have been in corn as in wheat, periods of relative scarcity of deliverable supplies, notably in 1935, 1936, and 1937, when near futures commanded a high premium. So also there have been periods of abundant supplies as in 1926 and 1927, and in 1933 and 1934 when expiring futures sold at a discount. As in wheat this inverse relationship is only a general one.

There are a number of exceptional price situations shown in figures 27 to 30, which are difficult to explain simply on the basis of plentiful or scarce supplies. Fully to understand these cases additional facts are needed regarding the manner in which the futures contracts were created and closed out. To some extent, too, each case is a product of circumstances peculiar to it. While it is not possible here to present all the surrounding facts of each of these "cases", it is possible to point out certain salient features of them and in so doing set forth the principal factors other than scarcity of deliverable supplies affecting prices.

## ABNORMAL WHEAT SITUATIONS

The price of 1925 May wheat (relative to July) was somewhat above average during April and May of that year. The future did not close at an abnormal level, however, and appears to be adequately explained by the relative scarcity of deliverable supplies.

Supplies continued scarce during July of 1925, and this fact may have encouraged a squeeze in July futures during the last 3 days of trading. Prior to the 29th, the July future had been running about 2 cents above the September. On July 29 it closed at 5½ cents above; on July 30, 6½ cents above, and on July 31, 16½ cents above the September. To what extent individual trading operations and posi-

tions were instrumental in bringing about this result is not known. It is to be observed, however, that deliverable supplies continued small and that open contracts carried into the delivery month were materially above average. At the opening of the last trading day there were still remaining 4.7 million bushels open to be satisfied either by offset or delivery. These facts, if nothing else, present a setting favorable for a squeeze.

Relatively large premiums continued during the expiration of the 1925 September and the 1925 December futures. They reached extreme proportions during the following April and May in the 1926 May wheat future. There was, however, no tendency for prices to advance as the last trading day approached, and the relatively high premiums shown appear to have been largely the result of abnormally small supplies.

#### THE 1926 JULY SQUEEZE

This would also have been true of the 1926 July wheat future but for an exceptional delivery circumstance which made its full effect felt on the last trading day. With supplies relatively scarce, open contracts in the July future continued fairly large into the delivery month. At the end of June they amounted to 37.2 million bushels. As of the close July 15 they were 17.9 millions, and at the close July 24 they still aggregated 9.9 millions. At this point the course of prices suggests nervousness on the part of the shorts. One leading long—an export firm—chose to stand for actual delivery. While the bulk of its contracts were met by July 31 this was accomplished only by forced shipments of wheat to Chicago, extensive track deliveries with attending confusion, and the forcing up of the July future from a  $\frac{1}{2}$ -cent discount under the September on July 24 to a  $13\frac{1}{2}$ -cent premium over the September as of the close, July 31. There is little evidence that this exporter entertained any motive in taking delivery other than to merchandise the grain. The case illustrates, quite apart from motive, the extreme sensitiveness of the price structure both to the threat of taking delivery in large amounts and to the actual taking of delivery on a sizable scale when deliverable supplies are small.

#### A SITUATION OF UNUSUALLY LARGE SUPPLIES

The next abnormal instance is one of extremely large deliverable supplies. Outstanding in this regard, as shown in figure 27, were the 1929 May, July, September, and December futures. During the 2 months prior to the expiration of these futures they averaged the following discounts: May, 3.89 cents under July; July, 4.44 cents under September; September, 8.03 cents under December; and December, 10.71 cents under the 1930 May. This was a period during which supplies in leading terminal markets were increasing rapidly, and especially in Chicago, with the result that additional purchases by hedgers became attractive only at increasing discounts. A further point worth observing is that maximum supplies can bring about unusual discounts only to a point where carrying costs of marginal hedgers are fully met. For this reason futures discounts have a fairly well defined lower limit in contrast to futures premiums, which have no marginal upper limit when supplies appear inadequate.

## THE FEDERAL FARM BOARD CASE

Unusually large supplies continued in 1930 and 1931, but the price situation changed from one of abnormal discounts to one of abnormal premiums. The occasion for this as mentioned earlier<sup>35</sup> was the very large purchases financed by the Federal Farm Board. These purchases constituted temporary withdrawals from commercial supplies. Their effect upon relative futures prices can be seen in 1930, 1931, and 1932. The maximum influence is shown in the 1931 May future where large futures purchases were made. The case is interesting here as an illustration of the possibility of a market squeeze despite the presence of apparently large deliverable supplies.

In the 1935 December, the 1936 May, the 1936 December, and the 1937 May futures fairly large premiums occurred. They appear to be adequately accounted for by the relatively small supplies available for delivery at the time.

## ABNORMAL CORN SITUATIONS

There have been in corn as in wheat unusual price situations at delivery time. These have developed most frequently toward the end of the crop year, either in the July or in the September futures. Thus the 1923 July and the 1923 September futures commanded fairly large premiums. Furthermore, the July future advanced from a 2½-cent premium on June 30 to a 14½-cent premium at the close, July 31. Small supplies available at the time may not have been sufficient to account for these price relationships though additional data are lacking.

## THE 1928 JULY SQUEEZE

The next important squeeze situation in corn occurred in July 1928. Deliverable supplies were smaller in the summer of 1928 than they had been in 1926 or 1927, but they were still above normal for that time of year (fig. 30). Despite that fact three leading speculators bought July futures heavily. By June 30 they held a combined long position in July corn of 14,160,000 bushels. This was approximately 50 percent of the total long commitments in the July future as of that date. The positions held by these three were not materially reduced during July. This was at least contrary to the hopes if not the expectations of the shorts. Out of a total of 12,818,000 bushels delivered on July 31, 11,985,000 bushels, or 93.5 percent, went to the three leading longs. These operations were accompanied by forced shipments of corn to Chicago with track deliveries during the last 3 trading days. Despite these efforts over 1,000,000 bushels of July futures were defaulted. On May 31 the July future closed ¾-cent over the September; on June 30 it closed 3 cents over; on July 20 it closed 9½ cents over; on July 31 it closed 20½ cents above the September.

## FURTHER CONGESTION IN THE 1928 SEPTEMBER FUTURE

A congested delivery situation of a somewhat different order occurred 2 months later in 1928 September corn. The widespread interest attracted into July corn continued into the September future. For some, perhaps, with the thought of repeating their profits; for

<sup>35</sup> See above, p. 35.

others with the hope of recouping their losses. On August 30 open contracts in September corn were slightly over 25 million bushels, an extremely large interest at this point in the crop year. Against this was a deliverable supply of 8.5 million bushels. This doubtless appeared ample, assuming a normal amount of contracts offset during the month. But an important fraction of these supplies was held in Chicago by the three leading July longs. One of the three was reported as holding over 3,000,000 bushels on August 24. To make the matter still more delicate, these three leaders, believed to be supporting the September future, gradually liquidated their long positions. One left the market at the end of July to return on the short side on September 28. Another closed his long position on August 10 and went short in September corn; the third closed his long position on September 21 and went over to the short side, being about 2,000,000 bushels short on the morning of the last trading day.

This shifting of market leadership to the short side appears ultimately to have had a noticeable effect upon September prices. Prices held fairly well throughout September until the last trading day—September 29. On the close of September 28 the September future was 16½ cents over the December and had been 24½ cents over a week before. On September 29 corn broke 9½ cents and closed 7½ cents over the December. Here the initiative was taken by the longs in a last-minute, frantic effort to sell out their positions. While the forces at work in this case were not unlike those of the usual squeeze, the final score turned out in favor of the shorts instead of the longs.

#### THE 1931 JULY CORNER

The next abnormal delivery situation occurred in the 1931 July corn future. It was a one-man performance with a rather large following. On April 24 a leading Chicago professional began buying July corn. By the end of June he held in his own name and in the names of several relatives and friends 8,400,000 bushels. His line at this point accounted for 57 percent of the total open on the long side of the July future. Very little of this long line was sold, so that as each day passed the demand for supplies became increasingly urgent. Deliverable supplies at the end of June were 5.3 million bushels with about half of this in Chicago. Purchases of cash corn at more and more distant and smaller markets had to be made. A total of 3,514 cars was shipped to Chicago from July 20 to July 31 to meet the demands of this one interest. They were in fact practically all met with deliveries of over 8,000,000 bushels but not without widespread disturbance of normal grain movements and prices. On June 30 the July future closed 1½ cents over the September; on July 20 it closed 5½ cents above; on the 25th, 7¾ cents above and on the 31st, 22¾ cents above the September.

#### THE 1937 SEPTEMBER CORNER

Corn supplies were plentiful in 1932-34 but became scarce after the drought of 1934. A second severe drought in 1936 continued and aggravated the situation. Figure 28 shows the effect of these two years upon relative corn prices at delivery time. The 1935 May,

the 1935 July, and the 1935 September were all relatively high in price. So also were the 1936 December, the 1937 May, the 1937 July, and the 1937 September. Each of these seven cases includes a story of conflicting opinion, nerve, and purchasing power. Each is in the main like, but in certain details unlike, every other. Of these seven cases, the 1937 September situation is the most extreme and a very brief analysis of it will have to serve for the group.

The story of 1937 September corn turns largely around the long operations of a prominent Minneapolis cash-grain company. A complaint was filed against this firm by the Secretary of Agriculture after investigation by the Commodity Exchange Administration.<sup>36</sup>

The details which follow are drawn from the facts alleged in this complaint. The firm had held a long futures position in the 1936 December and in turn in the 1937 May and the 1937 July. In addition to these futures positions their normal merchandising business gave them substantial holdings of cash corn in a period of extremely small deliverable supplies. Coming at the end of the crop year, therefore, their operations were certain to have a marked influence upon September corn if conducted in any sizable volume. By August 12 they had acquired a long position in September corn in excess of 8,000,000 bushels. This they carried in part in their own name and in part under the names of two other prominent cash-grain firms to August 27 when it was increased to over 9,000,000 bushels and so continued through September 14. Thereafter their position was reduced somewhat, but at no time did it fall below 6,000,000 bushels.

As the delivery month progressed market strain continued to mount with short sellers attempting either to offset their positions or obtain supplies for actual deliveries. These supplies were not forthcoming, in part because they were extremely scarce, but in part because, it was alleged, the meager supplies which were attracted to the market were promptly bought by the leading long by overbidding all competitors.

The effect upon the price structure was pronounced. Figure 28 shows clearly the extremes of this future in comparison with any other during the preceding 15 years. On July 31 the September future closed 24½ cents above the December; on August 31 it was 35 cents above the December; on September 15 it was 42½ cents above. At the close of trading September 24 the Chicago Board of Trade officially discontinued further trading in the September future and fixed a settlement price for all unfilled contracts at \$1.10½. This was 46½ cents above the close that day of the December future.

The complete story of this episode, which ended in what was alleged to have been a corner of September corn, is a long one. The matters here set forth are those which bear especially on the problem of the relation between deliverable supplies, open maturing futures contracts, and futures prices. In these particulars it is in character, if not in extent, very much like the other cases previously outlined.

<sup>36</sup> *Secretary of Agriculture, Complainant v. Cargill, Inc., Cargill Grain Company of Illinois, John H. MacMillan, Jr., E. J. Grimes, Julius Hendel, and Philip C. Sayles, Respondents*, Commodity Exchange Administration Docket No. 11, Dec. 22, 1938. On Mar. 8, 1940, the Secretary of Agriculture signed an order denying trading privileges on all contract markets to Cargill Grain Co. of Illinois and John H. MacMillan, Jr. president of both Cargill Grain Co. of Illinois and Cargill, Inc.



## RÉSUMÉ

Futures contracts, as now drawn, give to every buyer the right to demand and to every seller the right to make fulfillment by actual delivery. This right or privilege is socially desirable so long as deliverable supplies prove adequate to meet maturing futures contracts. But from time to time in the past this balance between deliverable supplies and maturing contracts has not been maintained and forced movements of supplies and prices have resulted. The elements present in most of these cases of congestion are:

1. A small deliverable supply (relative to other years).
2. One or a few interests have large commitments open on the long side of the maturing future.
3. These leading longs make no indication of any kind that they are going to sell out their positions.
4. The short interests observe a steadily decreasing period of time in which to acquire supplies to fulfill their contracts.
5. To offset their commitments in the maturing future, the short interests may bid against one another in attempting to cover their positions.
6. As an alternative, the short interests may bid against one another for available supplies of cash grain in order to fulfill their sales by delivery.

A setting of this kind may cause prices to advance materially but finally end with all contracts fulfilled either by offset or delivery, constituting a squeeze. Or the long interest or interests may stand for delivery, with the shorts unable to deliver in full, with still higher and more uncertain prices, constituting a corner. In either case the net effect is artificial spot and current futures prices causing harmful diversion of supplies, sales and shipments in the cash-grain trade with an equally harmful effect upon the speculative trade, encouraging reckless guesswork at the expense of intelligent forecasting.

## SUMMARY

The Commodity Exchange Act has as its broad objective the development and maintenance of informed, competitive markets. A perfectly informed market is one in which all the participants are armed with full knowledge of past and current trade conditions. A perfectly competitive market is one entirely free from control of any sort.

It is not difficult to demonstrate that present-day markets are far from this ideal. Complete information on past and present trade conditions is not available. Such fundamental information as exists is fully used only by a few. A liberal supply of superficial but popular material is continually added to mold the opinion of those who find formal facts too dry or difficult. Many traders, professionals as well as amateurs, form their judgments of the future course of prices purely from the way in which prices have acted in the immediate past.

To weed out the uninformed as well as the manipulative in market opinion and practice is not an easy task. In attacking this problem some 15 years ago, the Grain Futures Administration soon learned that, apart from obvious cases of misrepresentation or fraud which could be directly prosecuted, the usual run of trading is an intricate mixture flowing from many types of buyers and sellers, some of whom appear to exert a desirable market influence while others do not. It is not possible to isolate any one type and then observe the separate

effect of its trading upon prices. Instead, statistical techniques must be applied to uncontrolled mass data.

The present bulletin brings together some of the results of earlier and current studies conducted along these lines. The report is limited to grain with special reference to futures trading upon the Chicago Board of Trade. Broadly considered grain prices reflect the composite opinion and purchasing power of all who are willing to trade. There is ample evidence to show that intelligent appraisals regarding such matters as acreage, growing conditions, supply, shipments, domestic and foreign demand carry the greater weight in the formulation of prices, especially over long periods of time. But there is also ample evidence to show that opinions drawn from all sorts of nonfundamental sources—the advice of friends, price movements, tips, gossip, and the like—have in their composite effect a noticeable influence upon prices, especially when coupled with unusual purchasing power. Trading of this latter type is conducted by a wide variety of individuals. These participants create an urgent demand for timely as well as profuse information upon which they feed; they add to the price structure a characteristically sensitive and at times erratic behavior.

Further classification of these traders by size of trade, by size of market position, by duration and type of trade and in turn observing the net effect of each upon prices indicates the following central tendencies:

1. Large net trades (or large changes in net positions), made by single interests in brief periods of time usually cause prices to move with the trades, i. e., if purchases, prices advance; if sales, prices decline.
2. When the net of small speculative trades mounts to large figures in brief periods of time prices may move with the trading. This does not often happen, however, since it requires continually advancing prices to unusual levels to encourage reckless buying by the general public.
3. As a rule the net of small speculative trades moves opposite to prices, i. e., small traders sell on balance as prices advance and buy on balance as prices decline.
4. The larger the net trades made by single interests in brief periods of time the more certain it becomes that prices will move in the same direction as the trades.
5. Large long commitments held by single interests in a maturing future, when the deliverable supply is relatively small, usually cause that future to advance unduly in price relative to more distant futures.

These few though important generalizations regarding purely market operations are a product of several years' investigation by the Grain Futures Administration conducted mainly in the years 1925 to 1935. Supplementing these purely market operations are other practices which, while not usually having a direct price effect, are readily recognized as socially undesirable. These include sharp practices in the execution of customers' trades, fictitious methods of trading including the bucketing of orders, misleading accounting practices, and unsound methods of handling customers' funds. Most of these matters were unknown or only vaguely sensed when the Grain Futures Act was passed in 1922. For this reason the original act proved in many respects inadequate to handle them. As a result, the act of June 15, 1936 was passed which substantially amended and greatly broadened the earlier act.

Time will fully tell the story of how effectively the amended act, known as the Commodity Exchange Act, has altered the methods of trade briefly summarized in this bulletin. The act is based upon the premise that futures trading properly conducted is capable of making a net contribution to the market. It is capable of offering a broader market for the buyers and sellers of the commodity concerned; it is capable of providing a more responsive and more delicately adjusted price structure; it is capable of supplying a news and quotation service not likely to be so complete in its absence; it is capable of supplying a measure of price insurance through hedging. These are matters of net social gain. What is most needed is to eliminate from the market those elements which seriously impair these services.

It is not in place here to review in detail the various provisions of the Commodity Exchange Act designed to meet this problem (16).<sup>37</sup> Certain forms of trade are made unlawful, including cheating, fraud, bucketing, wash sales, fictitious trades, privilege trades, manipulating or attempting to manipulate prices, cornering or attempting to corner any commodity. Other requirements, such as the registration of commission merchants and floor brokers, the supervision of customers' margin moneys, the control of excessive speculation by individual interests through limitation of the size of lines they are allowed to carry and limitations regarding the period and terms of delivery on maturing futures contracts, are broadly regulatory in character and designed to prevent manipulative or unfair practices from developing. To some extent these provisions have already proven their worth in minimizing certain undesirable types of trading and price influence reviewed in this report. They will increase in value as methods of enforcement improve and as traders and exchange officials more fully realize the capacity of the regulations to better their markets.

On the positive side, improvement lies along lines of a more accurate, a more complete, and a wider dissemination of worth while information. This is a long-run program of research and education which the Commodity Exchange Administration shares with other public and private interests. Together with the regulatory program it promises large dividends if it assures at all times open and informed commodity markets.

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# APPENDIX

TABLE 9.—Current estimates of wheat supplies about September of each year, 1923 to 1937

[In million bushels, l. e., 000,000 omitted]

About September	United States		Canada		Visible: <sup>1</sup> Argentina, Australia, Europe	European production <sup>2</sup>	Total
	Carry-over	Crop	Carry-over	Crop			
1923.....	137	780	12	470	146	1,239	2,793
1924.....	144	837	45	262	152	1,131	2,601
1925.....	115	700	26	392	138	1,322	2,693
1926.....	105	839	36	306	130	1,278	2,787
1927.....	122	861	48	456	156	1,270	2,916
1928.....	124	901	78	550	158	1,364	3,175
1929.....	247	786	104	204	206	1,371	3,011
1930.....	303	838	111	585	151	1,322	3,110
1931.....	326	886	133	271	170	1,380	3,184
1932.....	355	715	132	467	140	1,489	3,328
1933.....	393	507	212	283	178	1,618	3,191
1934.....	284	493	104	277	252	1,460	2,962
1935.....	152	595	203	201	161	1,547	2,940
1936.....	156	630	108	233	133	1,488	2,728
1937.....	103	886	33	188	138	1,537	2,885

<sup>1</sup> Total of Argentine and Australian stocks, United Kingdom visible and afloat to Europe.

<sup>2</sup> 30 countries excluding Soviet Russia.

Source: Current official and private estimates as issued by the U. S. Department of Agriculture.

TABLE 10.—Current estimates of United States corn supplies about December, and of United States oats supplies about August, of each year, 1923 to 1937

[In million bushels, i. e., 000,000 omitted]

About December	Corn			About August	Oats		
	Carry-over	Crop	Total		Carry-over	Crop	Total
1923.....	148	3,054	3,202	1923.....	75	1,316	1,392
1924.....	186	2,437	2,623	1924.....	69	1,439	1,508
1925.....	104	2,901	3,005	1925.....	116	1,387	1,503
1926.....	341	2,645	2,986	1926.....	142	1,311	1,453
1927.....	214	2,786	3,000	1927.....	73	1,279	1,352
1928.....	87	2,840	2,927	1928.....	44	1,442	1,486
1929.....	148	2,622	2,770	1929.....	96	1,203	1,299
1930.....	136	2,088	2,224	1930.....	76	1,316	1,392
1931.....	169	2,557	2,726	1931.....	81	1,170	1,251
1932.....	280	2,908	3,188	1932.....	79	1,215	1,294
1933.....	388	2,330	2,718	1933.....	161	667	828
1934.....	331	1,351	1,712	1934.....	51	545	596
1935.....	64	2,203	2,267	1935.....	0	1,187	1,187
1936.....	179	1,524	1,703	1936.....	206	773	978
1937.....	66	2,645	2,711	1937.....	11	1,131	1,142

Source: Current estimates of the U. S. Department of Agriculture.

TABLE 11.—Wheat: Combined net position of two groups of traders having positions of 200,000 bushels or more as of the close of trading Friday of each week, Chicago Board of Trade, July 5, 1935, to June 24, 1938

(In thousands of bushels, i. e., 000 omitted)

Close of trading	Hedgers	Speculators	Close of trading	Hedgers	Speculators	Close of trading	Hedgers	Speculators
<b>1935</b>			<b>1936</b>			<b>1937</b>		
July 5	-26,593	1-2,276	July 3	-8,613	+4,919	July 2	-9,992	-13,037
12	-22,605	-3,393	10	-22,060	+8,050	9	-23,275	-8,518
19	-28,497	+2,434	17	-35,189	+7,449	16	-37,325	+5,106
26	-32,047	+7,626	24	-49,387	+8,987	23	-47,827	-1,725
Aug. 2	-43,858	+7,422	31	-50,902	+16,150	30	-60,352	+2,282
9	-52,662	+7,997	Aug. 7	-56,717	+9,257	Aug. 6	-64,483	-783
16	-56,376	+8,931	14	-53,881	+8,370	13	-66,781	+31
23	-63,951	+12,238	21	-56,499	+14,161	20	-67,687	-2,556
30	-69,651	+11,798	28	-63,456	+8,971	27	-63,080	-2,582
Sept. 6	-72,063	+13,620	Sept. 4	-55,507	+9,668	Sept. 3	-62,805	-2,196
13	-75,387	+14,882	11	-63,948	+10,482	10	-64,387	-1,269
20	-74,398	+17,574	18	-52,015	+10,619	17	-61,110	-3,107
27	-73,760	+14,032	25	-53,261	+9,216	24	-60,830	+1,352
Oct. 4	-74,298	+16,383	Oct. 2	-64,541	+6,557	Oct. 1	-66,410	+4,271
11	-76,299	+17,752	9	-53,675	+7,166	8	-61,680	-1,665
18	-76,472	+11,391	16	-52,606	+11,266	15	-46,107	-835
25	-78,008	+11,544	23	-51,629	+9,385	22	-46,289	-502
Nov. 1	-76,737	+8,588	30	-51,028	+8,379	29	-48,288	-1,393
8	-77,487	+7,955	Nov. 6	-49,665	+5,907	Nov. 5	-50,068	-1,069
15	-76,136	+10,109	13	-48,660	+6,860	12	-41,846	+149
22	-76,322	+11,538	20	-46,658	+8,196	19	-40,565	+2,767
29	-75,629	+9,377	27	-44,937	+9,614	26	-42,450	+3,938
Dec. 6	-74,150	+9,716	Dec. 4	-41,734	+8,495	Dec. 3	-43,585	+5,219
13	-72,504	+8,342	11	-43,630	+11,618	10	-43,871	+3,929
20	-70,248	+10,523	18	-51,056	+15,663	17	-40,943	-1,243
27	-60,792	+10,392	24	-57,100	+14,046	24	-43,974	-1,720
			31	-57,576	+12,148	31	-42,914	-3,321
<b>1936</b>			<b>1937</b>			<b>1938</b>		
Jan. 3	-65,555	+11,428	Jan. 8	-59,642	+13,049	Jan. 7	-40,700	+1,531
10	-62,189	+11,804	15	-58,655	+13,379	14	-41,382	+2,822
17	-61,867	+10,933	22	-57,103	+10,354	21	-41,571	+1,870
24	-60,894	+11,101	29	-54,729	+9,983	28	-38,529	+1,287
Feb. 7	-58,753	+9,138	Feb. 5	-50,542	+12,477	Feb. 4	-37,295	+647
14	-56,495	+8,220	11	-49,241	+14,346	11	-37,218	+847
21	-51,977	+4,509	19	-52,006	+14,870	18	-37,328	-194
28	-49,256	+7,190	26	-48,880	+10,921	25	-36,656	-802
Mar. 6	-47,834	+5,388	Mar. 5	-46,146	+13,015	Mar. 4	-37,904	-817
13	-47,352	+6,687	12	-45,351	+9,904	11	-36,772	-1,208
20	-43,967	+3,947	19	-43,915	+10,779	18	-30,873	-2,120
27	-42,154	+3,001	26	-41,032	+9,695	25	-28,544	-3,342
Apr. 3	-39,102	-4,463	Apr. 2	-39,065	+4,663	Apr. 1	-26,117	-4,588
9	-37,218	-4,608	9	-31,964	+2,845	8	-22,898	-4,871
17	-30,893	-922	16	-28,567	-2,018	14	-19,597	-2,811
24	-27,426	+1,225	23	-24,154	-2,618	22	-13,071	-3,245
May 1	-25,480	-1,158	30	-23,834	-5,734	29	-15,640	-3,461
8	-24,631	-2,625	May 7	-21,226	-9,202	May 6	-16,143	-1,205
15	-21,962	-6,207	14	-20,098	-9,119	13	-14,284	-957
22	-21,043	-4,119	21	-16,954	-8,711	20	-10,878	-3,575
29	-20,642	-3,371	28	-17,927	-18,514	27	-9,732	-2,868
June 5	-20,825	-1,332	June 4	-12,885	-22,235	June 3	-7,785	-3,670
12	-19,600	-2,663	11	-2,536	-20,246	10	+2,677	-4,345
19	-13,621	+1,649	18	-2,130	-19,612	17	-3,065	+1,343
26	-8,094	-69	25	-3,513	-15,303	24	-7,019	+524

1 The plus sign (+) indicates a long position; the minus sign (-) a short position.

TABLE 12.—Corn: Combined net position of two groups of traders having positions of 200,000 bushels or more as of the close of trading Friday of each week, Chicago Board of Trade, November 2, 1934, to October 22, 1937

(In thousand bushels, i. e., 000 omitted)

Close of trading	Hedgers	Speculators	Close of trading	Hedgers	Speculators	Close of trading	Hedgers	Speculators
<b>1934</b>			<b>1935</b>			<b>1936</b>		
Nov. 2	-45,058	+8,883	Nov. 1	-2,030	-4,814	Nov. 30	+3,959	+710
9	-46,528	+7,977	8	-2,363	-4,033	Nov. 6	+4,305	+566
16	-45,078	+9,562	15	-2,789	-3,351	13	+3,405	+310
23	-42,549	+8,806	22	-3,127	-2,279	20	+1,445	+62
30	-38,437	+7,981	29	-2,583	-2,376	27	+312	-340
Dec. 7	-37,261	+7,633	Dec. 6	-3,013	-1,820	Dec. 4	-2,549	-53
14	-36,275	+7,725	13	-4,126	-764	11	-4,553	-268
21	-36,454	+7,575	20	-3,449	-1,009	18	-5,548	-49
28	-35,495	+8,733	27	-3,685	-407	24	-7,591	-452
						31	-7,541	+03
<b>1935</b>			<b>1936</b>			<b>1937</b>		
Jan. 4	-34,048	+8,516	Jan. 3	-3,143	-423	Jan. 8	-7,760	-983
11	-32,032	+8,800	10	-3,595	-493	15	-7,620	-716
18	-27,885	+4,635	17	-3,557	-370	22	-7,328	-797
25	-25,565	+3,960	24	-4,157	-495	29	-7,547	-536
Feb. 1	-21,914	+5,133	31	-4,371	+28	Feb. 5	-7,398	+35
8	-20,519	+4,573	Feb. 7	-4,750	+7	11	-7,398	-91
15	-19,217	+4,899	14	-5,009	-11	19	-7,075	+636
21	-17,769	+5,949	21	-5,165	-180	26	-6,232	+822
Mar. 1	-17,273	+4,610	28	-5,106	-100	Mar. 5	-6,166	+1,280
8	-17,869	+3,993	Mar. 6	-6,063	+168	12	-5,719	+1,504
15	-15,301	+4,226	13	-6,669	+199	19	-4,557	+1,253
22	-13,403	+3,635	20	-6,699	+550	25	-3,710	+2,064
29	-13,287	+4,537	27	-6,619	+462	Apr. 2	-3,790	+2,414
Apr. 5	-14,064	+5,165	Apr. 3	-5,658	+334	9	-3,912	+1,670
12	-15,486	+4,666	9	-5,626	+607	16	-2,345	+1,914
18	-15,562	+5,622	17	-4,354	-326	23	-1,600	+2,734
26	-13,615	+4,608	24	-3,936	+538	30	-2,020	+3,151
May 3	-14,199	+3,797	May 1	-2,358	+1,246	May 7	-1,295	+3,983
10	-12,891	+4,120	8	-1,285	+716	14	-1,700	+4,089
17	-12,491	+3,907	15	-211	-47	21	-1,825	+3,852
24	-10,782	+3,644	22	+69	-459	28	-2,812	+4,385
31	-9,026	+3,150	29	+832	-2,294	June 4	-2,647	+5,154
June 7	-8,506	+2,989	June 5	+1,007	-965	11	-2,554	+6,815
14	-7,035	+3,315	12	+533	-558	18	-2,662	+8,172
21	-7,248	+4,230	19	-253	-465	25	-2,410	+7,886
28	-6,049	+3,217	26	-467	+100	July 2	-1,700	+8,789
July 5	-5,427	+2,781	July 3	-837	-290	9	-1,361	+6,602
12	-4,868	+1,899	10	-929	-505	16	-1,663	+8,099
19	-4,608	+1,684	17	-600	+15	23	-1,823	+5,608
26	-3,437	+1,205	24	+975	+1,838	30	+251	+1,588
Aug. 2	-2,544	-245	31	+1,358	+1,382	Aug. 6	+226	-750
9	-3,052	-1,926	Aug. 7	+368	+529	13	+1,650	-289
16	-2,075	-2,064	14	+435	+199	20	-434	+217
23	-2,239	-1,990	21	+608	+1,070	27	+922	-320
30	-1,745	-2,487	28	+440	+942	Sept. 3	+699	-572
Sept. 6	-2,282	-2,032	Sept. 4	+628	+1,749	10	+291	-942
13	-1,809	-1,960	11	+1,486	+1,177	17	-1,369	-981
20	-1,462	-2,316	18	+2,960	+1,237	24	-3,069	+2,405
27	-937	-3,730	25	+2,635	+769	Oct. 1	-4,037	-944
Oct. 4	-1,720	-2,490	Oct. 2	+2,865	+587	8	-3,083	-1,141
11	-2,239	-3,133	9	+3,406	+1,210	15	-1,386	-1,230
18	-2,968	-4,393	16	+1,172	+741	22	+236	-916
25	-2,508	-3,263	23	+3,427	+733			

The plus sign (+) indicates a long position; the minus sign (-) a short position.

TABLE 13.—Total supply of wheat and corn in public and private store, Chicago and 11 adjacent centers,<sup>1</sup> for four delivery months, July 1923 to May 1938

[In thousand bushels, i. e., 000 omitted]

Year	Wheat: Average <sup>2</sup> supply during—				Corn: Average <sup>3</sup> supply during—			
	May	July	Septem- ber	Decem- ber	May	July	Septem- ber	Decem- ber
1923.....		8,368	30,288	40,490		1,788	1,048	4,640
1924.....	24,879	21,996	48,465	40,437	8,177	3,936	3,780	9,755
1925.....	8,352	9,871	19,042	16,418	18,459	8,328	4,695	8,695
1926.....	7,120	9,768	38,060	29,952	28,750	22,841	15,156	27,451
1927.....	10,070	9,364	31,665	26,064	28,564	27,318	18,404	19,071
1928.....	11,068	14,482	53,144	52,268	27,943	12,502	7,416	8,100
1929.....	42,175	50,830	81,364	73,446	18,070	7,822	3,086	4,006
1930.....	50,506	53,339	83,834	75,260	12,982	3,577	2,697	8,504
1931.....	31,429	91,619	109,708	98,844	12,003	6,272	6,085	8,050
1932.....	93,155	96,094	105,882	90,524	10,696	8,876	11,736	17,652
1933.....	64,832	63,863	68,214	57,256	24,737	39,271	40,226	45,272
1934.....	37,752	48,514	61,629	44,803	32,864	22,044	40,402	30,218
1935.....	18,684	13,376	36,644	32,367	7,324	3,970	1,578	4,598
1936.....	15,038	25,063	43,735	30,870	4,970	3,756	3,026	7,042
1937.....	8,437	30,636	77,993	50,572	1,942	3,346	2,628	19,582
1938.....	18,776				20,094			
Mean <sup>4</sup> .....	23,026	28,138	55,049	45,714	17,262	7,154	5,012	10,601

<sup>1</sup> Milwaukee, Cincinnati, Indianapolis, Louisville, Nashville, Peoria, St. Louis, Kansas City, Omaha, St. Joseph, and Sioux City.<sup>2</sup> Supplies for each month are the mean of the amounts in store on the last Saturday of the month previous and the last Saturday of the month shown.<sup>3</sup> The mean of the 5 central items when the 15 monthly items are arrayed according to size.TABLE 14.—Average <sup>1</sup> premium or discount of the near future above or below the next succeeding future for wheat and corn, Chicago Board of Trade, 1923-1938

[Cents per bushel]

Year	Wheat: Average closing-price spread				Corn: Average closing-price spread			
	May- July	July- Septem- ber	Septem- ber-Decem- ber	Decem- ber- May	May- July	July- Septem- ber	Septem- ber-Decem- ber	Decem- ber- May
1923.....		+0.68	-3.38	-5.17		+5.80	+16.06	-0.82
1924.....	-1.89	-33	-4.38	-5.74	-0.55	+2.39	+6.21	-4.99
1925.....	+10.66	+3.60	+2.79	+4.36	-3.15	-1.51	+11.82	-5.54
1926.....	+23.51	+3.02	-3.56	-3.00	-4.24	-5.72	-5.37	-8.88
1927.....	+4.62	+1.60	-4.12	-5.52	-4.54	-5.45	-3.22	-7.22
1928.....	-38	-2.42	-4.71	-7.18	-2.83	+6.27	+18.46	-5.58
1929.....	-3.89	-4.44	-8.03	-10.71	-3.15	-1.73	+3.48	-7.08
1930.....	-1.04	-3.04	-5.06	-4.20	-1.64	+7.72	+4.75	-4.91
1931.....	+22.15	-67	-2.81	-3.70	-1.75	+5.70	+5.07	-4.98
1932.....	-2.29	-2.34	-3.38	-3.89	-2.92	-2.14	-1.80	-4.81
1933.....	-1.10	-2.30	-3.60	-2.89	-2.24	-3.03	-4.82	-6.37
1934.....	+91	-1.05	-1.40	-1.13	-2.43	-1.68	-1.62	-7.97
1935.....	+36	-70	-1.71	+1.29	+5.85	+6.52	+19.32	-7.74
1936.....	+8.90	-43	+82	+3.04	+1.86	+2.51	+15.44	+6.24
1937.....	+10.65	+46	-1.24	+1.31	+11.62	+12.34	+35.39	-2.32
1938.....	+1.88				-1.40			
Mean <sup>2</sup> .....	+1.58	-.838	-3.267	-3.46	-2.17	+.49	+5.79	-4.85

<sup>1</sup> Premiums shown as a plus (+) and discounts shown as a minus (-) are the average differences between the near and next succeeding future for 13 dates prior to the expiration of the near future. For example (using the May to July spread) the dates are Mar. 31, Apr. 5, 10, 15, 20, 25, and 30, May 5, 10, 15, 20, 25, and last trading day of May.<sup>2</sup> Calculated as follows: The 15 spreads for each date (e. g., Mar. 31) were arrayed and the mean of the 5 central items determined. These 13 means were then averaged.



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