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The Importance of Hedging in Futures Trading; and the Effectiveness of Futures Trading for Hedging

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The reason why the lengthy and almost redundant title for this paper seemed necessary is that evidence bearing on the two parts is treated quite differently. On the first part—the *importance* of hedging in futures trading—the effort is to briefly review kinds of evidence that have long been available. On the second part—the *effectiveness* of futures trading for hedging—a particular piece of new evidence is emphasized. This difference in treatment is necessitated by the futility, on the one hand, of attempting to treat the evidence of the importance of hedging exhaustively in so brief a presentation; and, on the other hand, by the paucity of direct evidence on the effectiveness of futures trading for hedging. One would find too much to say on the first topic, too little to say on the second; so the compromise is to discuss them both.

The Importance of Hedging

The importance of hedging is best expressed in the categorical statement that futures trading depends upon hedging. Evidence of this dependence abounds in the statistics of commodity markets, and the habitue of the markets comes against such a constant stream of first-hand evidence that he takes the relationship for granted. Study the open interest in any commodity futures contract and you obtain insight into the economics of the commodity, so strong and general is the relationship. Find two commodities for which the open-interest pattern differs markedly and consistently and you will find that their production or distribution differs in such a way as to account for the contrasting open-interest patterns.

Consider, for instance, a contrast between two very important commodity futures markets, those for wheat and corn at Chicago. The open interest in wheat had a much wider seasonal range than that in corn during the 1920's and 1930's when both markets were thriving. The cause of this lay in the contrasting commercial movement, wheat being marketed rapidly, corn being marketed over a more prolonged period owing to slower harvesting

techniques plus the fact that it need not be harvested rapidly and the consideration that crib storage was a good drying method. The greater seasonal concentration in movement of wheat made for greater seasonal concentration in its hedging and hence in the open interest. Similarly, the average level of open interest in wheat was much larger than that in corn, for the reason that wheat had a greater *commercial* movement although corn was produced in much larger quantity. These are familiar facts, but the evidence they provide of the importance of hedging in futures trading bears continued emphasis. In these and many similar cases it is quite clear that the pattern of the open interest is dictated by the hedging use of the market. Nothing on the speculative side, that did not arise out of hedging business, could explain these use patterns.

For a large number of commodities the open interest in futures, in its seasonal and year-to-year fluctations, follows closely the commercial stocks or visible-supplies data. This generalization of the above cases is the strongest single class of evidence of the dependence of futures trading upon hedging. Even in markets where large proportions of the commercial stocks are not hedged, the minor fraction that is hedged characteristically dictates the pattern of open interest.

If it is not stock carrying it may be the hedging needs of certain processors that dictate the level of open interest. Thus, for example, the open interest pattern in soybean oil or in millfeeds has not typically conformed to the stocks pattern. Investigation of the hedging policy and practice of users of these contracts soon reveals that they are used for purposes other than stock carrying, however, and that the open interest still conforms to hedging use. Or it may be the financing of a growing crop rather than stock carrying which gives rise to hedging, as in the case of onions and potatoes; or the financing of imports, as in the case of coffee and cocoa; and in these cases as well it is hedging which dictates the open interest pattern.

In addition to seasonal and year-to-year patterns, there are long-term trends as well as singular episodes reflected in the open interest which can be shown to rest upon hedging use. The long-term decline in wheat-future business at Minneapolis relative to Kansas City since about World War I reflects the changing relative importance of the two as milling centers. The episode which was described by Working[1], in which soft wheats became the effective delivery at Kansas City in 1953 and the millers fled the market, illustrates vividly the importance of hedging. Only by a change in the contract to require a hard-wheat delivery were the hedgers persuaded to return and preserve this market from complete disuse. In sharp contrast to this singular episode which was of the market's own doing, some weighty evidence of the importance of hedging is found on many markets today and is neither of their doing nor to their liking. I refer, of course, to the general decline in levels of business on most futures markets—a decline which stems primarily and directly from the reduced need for hedging occasioned by the extensive stock-carrying engaged in by an agency of the federal government. Recent increases in business owing to the subsidy-in-kind program provide additional evidence that it is the demand for hedging which determines the level of use of futures markets.

[1] Holbrook Working, "Whose Markets?—Evidence on Some Aspects of Futures Trading," *The Journal of Marketing*, Vol. XIX, July 1954.

Evidence on this score, as suggested earlier, proliferates. I have sought merely to indicate the kinds and sources of available evidence on a question on which the evidence indicates overwhelmingly that futures trading depends upon hedging.

The Relationship Between Hedging and Speculation

The more difficult task, having drawn this conclusion, is to show the relationship between hedging and speculation in its bearing upon the question of the *effectiveness* of futures markets for hedging. For the inescapable conclusion which must then be drawn—that hedging depends upon speculation—shifts the emphasis to the importance of speculation, having just established the importance of hedging. Not only are the mutually interdependent relationships difficult for the inexperienced to grasp, but the evidence of the dependence of hedging upon speculation is not so easily marshalled. In consequence it is, I believe, this arc of the circle which needs most attention from those who would attempt to round out the general understanding of the role of futures markets.

Before presenting some direct evidence of the effectiveness of certain futures markets for hedging, I should like to comment upon the general relationship between hedging and speculation, orienting the commentary upon the data shown in the accompanying table. These data are of a sort readily available for many commodity futures markets, selected here for illustrative purposes from our four leading commodities which have highly developed futures markets. Without purporting to raise all of the questions suggested by this brief tabulation or to fully answer those raised, I next call your attention to some obvious comparisons and suggest some reasons for these.

Table 1. Percentage Composition of the Open Interest in Selected Commodity Futures; All Contract Markets Combined, 1948-58*

	Small-scale positions		Large-scale positions reported as					
			Speculation		Spreading		Hedging	
Commodity	Long	Short	Long	Short	Long	Short	Long	Short
Wheat	48.0	33.1	11.0	4.6	20.1	20.1	20.9	42.2
Corn	54.8	34.9	16.9	5.9	16.1	16.1	12.2	43.1
Oats	73.9	33.1	10.7	4.0	12.9	17.3	2.5	45.6
Soybeans	52.8	44.1	8.0	7.1	25.4	25.4	13.8	23.4

* Years are July-June, 1948-49 through 1957-58, excepting for soybeans, for which only the last five years were taken owing to the sharp upward trend in the data during the first five years. Data from U.S. Dept. Agr., Commod. Exch. Authority, *Commodity Futures Statistics* (Stat. Bul. 239, 1958).

In scanning the columns under "small-scale positions," the eye stops at oats, where the percentage figures are clearly out of line with the others. The large proportion of small-scale long positions reflects the large proportion of large-scale short-hedging positions. Oats hedging is unbalanced for two reasons (1) there is little processor hedging and (2) they are an import rather than an export crop. Unbalanced hedging makes for unbalanced speculation; a high proportion of the small-scale long position, being presumably speculative.

Turning to the columns under "speculation," one may be struck by the seemingly large amount of speculation in corn. A comparison with wheat provides some insight here. Corn is, again, a more unbalanced hedge than wheat, for both lack so much processor hedging and so much exporting. In wheat, in other words, substantial short hedging is offset by long hedging,

with resultant diminished need for speculation. This offset would be conjectural if it were not for the unique situation that the two subsidiary markets in wheat, at Kansas City and Minneapolis, are known to be almost entirely hedging markets, relying heavily upon a Chicago spread to provide some liquidity. If Kansas City and Minneapolis data could be subtracted all the way across from the wheat totals, the resultant Chicago wheat data would conform more closely to the corn data. Even the spreading totals in the next column would be brought into line, because those for wheat are swollen by an intermarket spread which is negligible in corn.

Looking further at the "spreading" columns, one finds oats have the only unbalanced spread because of the Winnipeg market, and the direction of the imbalance conforms to our earlier observation regarding oats imports. This unbalanced spread effectively transfers some long speculation to Winnipeg. Soybeans have the largest spreading proportion, partly because only the last five years of the decade are shown for soybeans, and spreading trended upward during the decade. Even so, it was also the largest during these five years, and the reasons probably include (1) the fact that there has been more opportunity for a processor spread, or what may be termed spreading by hedgers, and (2) the fact that the soybean market has required and attracted more speculation and thus provided more opportunity for a tax spread.

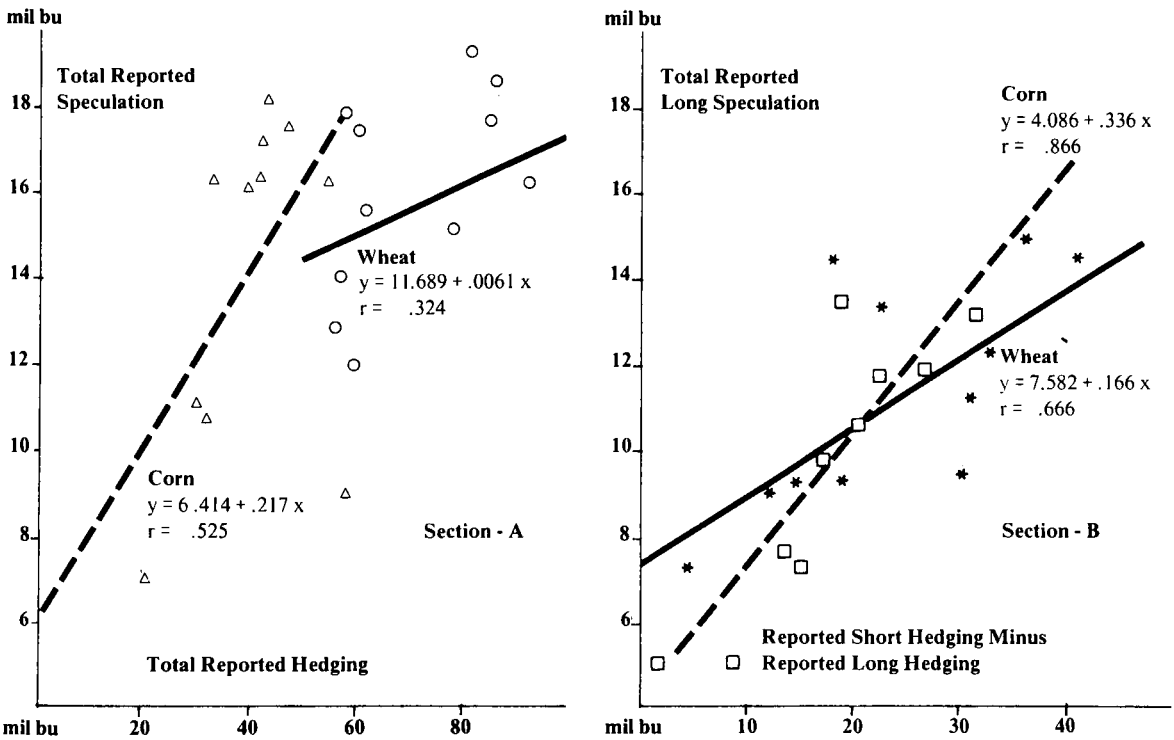
The most interesting comparison in the hedging columns has to do with the balance between long and short reported hedging, corn and especially oats being quite unbalanced while wheat and especially soybeans are more nearly balanced. The reflection of this characteristic in the speculation columns is of interest. Between wheat and corn, as already noted, more speculation per unit of hedging is apparently required for corn, the reason being that there is less long hedging to offset short hedging. Yet the same reasoning would lead one to expect that oats would require still more speculation per unit of hedging, which they apparently do not. The extraordinarily large amount of small-scale long positions in oats which would be mostly speculative, probably accounts for this apparent discrepancy. Soybeans, finally, appear not to fit the picture at all; for the hedging positions are most nearly balanced yet the reported speculation is a much higher proportion of reported hedging than in either wheat or oats. The reason for this is that the annual average figures used here are misleading indicators of the degree of balance in soybean hedging. The available semimonthly figures show that soybean hedging is much more out of balance than these figures suggest, being heavily net short during the first part of the crop year and heavily net long toward the end of the year. This is not true of the other commodities shown in the table, and it imposes particularly heavy speculative requirements on the soybean market. When the reported hedging position shifts from 10 million bushels net long to 16 million bushels net short in one month during which the reported long *plus* short hedging averages less than 40 million bushels,the market is under considerable stress. Yet for the five years shown in the table this was the average situation in soybeans for the month during which hedging went from net long to net short.

This emphasis upon the responsiveness of speculation to hedging needs may seem to minimize its responsiveness to other causal factors. Undoubtedly the amount of speculation in soybeans, *relative* to the amount of hedging, has

been high owing to the greater speculative opportunity that has been present in this fast-growing and relatively free market.

In summary, for four commodities that have large futures markets operating under similar circumstances, the first impression to be had from the table is one of confusion. Yet if due allowance could be made for different levels of reporting among these commodities, and *especially for different hedging uses*, the grossest dissimilarities in the table would be greatly modified, perhaps even to the extent that the general impression would be one of uniformity.[2] But even supposing this to be the case, there are many other commodity futures markets the data from which would *not* fit this picture of rough uniformity. The markets for these four commodities rank high in the amount of speculation relative to hedging; extending the list of commodities would soon encounter futures markets on which the speculative fraction is of an altogether smaller order of magnitude. These four are markets having a good deal of speculation, at least relative to most futures markets; and because they have a high level of hedging use relative to the potential that exists in the commodity movement, there is presumption that they are *effective* hedging

Figure 1. Relation Between Annual Average Reported Hedging and Speculation in Corn and Wheat Futures, 1947-58; Two Different Formulations



[2] An illustration of how adjustment for hedging use alters the impression from one of confusion to one of uniformity is provided in Figure 1. There it is shown (Section A) that the relation between total reported hedging and total reported speculation, annual averages of mid-month and month-end positions for corn and wheat, is not close for either corn or wheat and that the regression lines are much different between the two. When the relation between hedging and speculation is formulated in such a way as to take account of the different hedging use of the two markets (Section B), relating short minus long hedging to long speculation, the relationship is much closer for each and the individual regression lines are similar.

markets. In other futures markets, such as those for bran or coffee, for example, hedging has been light relative to the full potential, and speculation light relative to actual hedging. The presumption arising out of light hedging use that these have been relatively *ineffective* hedging markets suggests that the low level of speculation has been a detriment to effective hedging use. Observation of the quantities of hedging and speculation does not lead beyond the *presumption* of effectiveness or ineffectiveness for hedging, however, whereas direct evidence must be obtained elsewhere. It is some such direct evidence that is presented in the remainder of this paper.

Evidence on the Effectiveness of Futures Markets for Hedging

To go beyond a *presumption* of effectiveness for hedging it is necessary to start talking about what it costs to hedge. There are, of course, indicia of hedging effectiveness other than costs. What it costs to hedge must be related to what the hedge accomplishes. In markets with a good deal of speculation, hedging against risk in general is made possible by the liquidity of the market; whereas in the smaller and less speculative markets, *selective* hedging of *particular* price risks is done on the basis of price judgments. Markets having less speculation are necessarily markets in which the hedging is more speculative. In what follows, I have not only limited the analysis of hedging effectiveness to consideration of costs, but I speak in terms of only one dimension of costs. Those dimensions of costs which might spring first to mind—commissions and the gap between bid and asked prices—I have ignored in approaching that cost dimension which might more precisely be termed "the exceptional bias." Lest these remarks seem to place too great a qualification on what follows, I should add that I consider this the most important dimension of hedging costs, and hedging costs the most important indicator of market effectiveness.

A market on which hedging costs are high is obviously less effective for hedging than one on which hedging costs are low. Records are not available which would make it possible to measure hedging costs precisely, specifically, and directly; hence, resort must be had to general statistical measurements. The question which is answered statistically in the following analyses is whether the profits or losses from the long side in certain futures markets differ significantly from zero. In non-ethical terms, an attempt is made to ascertain statistically whether the market is balanced pricewise, or lopsided in favor of the long or the short side. A balanced market, one in which there are no profits or losses in the long run from maintaining a perpetual long position, is clearly an effective hedging market. I shall report the measured degree of imbalance, so to speak, in various markets under various circumstances, in terms of a statistic known as the t-ratio. In order to better convey the meaning of these t-ratios, let me provide an illustration in a framework familiar to most of you.

Suppose you were to maintain a long position in the Chicago wheat-futures market by routinely buying each future on the first trading day of the delivery month of the preceding future, and selling it on the first trading day of its own delivery month. If you happened to buy, say, the May future on March 1 to start your program, when both the May and March futures were at $2.25 per bushel, and ten years later after 50 successive trades sold out the March future on March 1, when both the March and May were again at $2.25 per bushel, you would say the market was unbalanced if you made or lost much money out of this operation, but balanced if you came out nearly even. Given the

pattern of wheat-price fluctuations that has prevailed in the past 10 years, an average profit of 3½ cents per bushel per future from such a program corresponds approximately to a *t*-ratio of 2.0, an average profit of 1¾ cents per bushel per future to a *t*-ratio of 1.0, and zero average profits to a *t*-ratio of zero. The *t*-ratio is a general statistic that carries meaning without regard to the particular context: but it is no doubt clear to all from this illustration why a *t*-ratio in the neighborhood of 2.0 is said to be significant. In probability terms, the odds are more than 20 to 1 against such profits resulting from the play of chance alone; yet the odds are only about 4 to 1 against average profits of 1 cent per bushel per trade (corresponding to a *t*-ratio of .67) resulting from the play of chance alone.

In what follows I have tested the hypothesis that certain markets over certain time intervals were balanced. If the observations are not inconsistent with the hypothesis, it is accepted; otherwise it is rejected. The level of rejection is taken to be a *t*-ratio of 1.7250,[3] which will seem less arbitrary when the contrast between levels actually accepted and rejected is seen.

Turning first to the commodities included in the table, for approximately the same period covered in the table, the following *t*-ratios were calculated:

(1) Wheat, Chicago Board of Trade, December 1, 1949 - March 1, 1958: $t = -.116$
(2) Corn, Chicago Board of Trade, December 1, 1949 - May 1, 1958: $t = -.234$
(3) Oats, Chicago Board of Trade, September 1, 1948 - March 1, 1957: $t = -.152$
(4) Soybeans, Chicago Board of Trade, May 1, 1955 - July 1, 1959: $t = .107$

The hypothesis that these futures markets were balanced is accepted. Shall we then say that futures trading is effective for hedging? In these four markets, yes; in others, not until we see the evidence. Consider next some markets which have the common characteristic that the level of speculation is lower than in the above four, but which provide separate bases for comparison with the above four as well as this common basis.

We look first at the coffee market, the Brazilian contract on the New York Coffee and Sugar Exchange, a different market for a different commodity, over essentially the same period as the first three above:

(5) Coffee "B," New York Coffee and Sugar Exchange, May 1, 1950 - December 1, 1958: $t = 1.788$

The hypothesis of balance is rejected, along with the conclusion of effectiveness for hedging.

Next we look at a different market for essentially the same commodity and time period as one previously considered, and obtain sharply contrasting results. Wheat on the Minneapolis Grain Exchange is compared with the results already shown for wheat on the Chicago Board of Trade:

(1) Wheat, Chicago Board of Trade, December 1, 1949 - March 1, 1958: $t = -.116$
(6) Wheat, Minneapolis Grain Exchange, May 1, 1949 - May 1, 1959: $t = 1.986$

[3] See table II for an excerpt from a table of distribution of *t*, and for details of the calculations, including prices and adjustments, if any, for price change.

Table II. *t*-Ratios* Computed to Test the Hypothesis that the Mean Profit from Recurrent Buying Does Not Exceed Zero

Market and Commodity	Dates of first purchase and final sale	Prices[1] at beginning and ending dates: Expiring future	Next future	X	*s*	N	*t*-Ratios
Wheat	Dec. 1, 1949-	218½	218½				
Chicago Board of Trade	Mar. 1, 1958	220¾	217⅞	-.22	12.15	41	-.116
Corn	Dec. 1, 1949-	128¾	130½				
Chicago Board of Trade	May 1, 1958	126¼	125¼	-.35	9.82	42	-.234
Oats	Sept. 1, 1948-	71⅝	74¼				
Chicago Board of Trade	Mar. 1, 1957	74¾	73	-.18	7.28	41	-.152
Soybeans	May 1, 1955-	249⅝	241[2]				
Chicago Board of Trade	July 1, 1959	223⅝	212⅛	.37	17.54	26	.105
Coffee, N.Y. Coffee	May 1, 1950-	45.10	43.20				
and Sugar Exchange	Dec. 1, 1958	42.00	37.90	1.73	6.27	43	1.788
Brazilian contract							
Wheat	May 1, 1949-	216½	202½				
Mpls. Grain Exchange	May 1, 1959	205⅛	207⅛	3.29	9.95	37	1.986
Bran, Kansas City	July 1, 1948-	58.50	51.50				
Board of Trade	Mar. 1, 1952	59.58	58.55	2.67	6.04	23	2.079
Bran, Kansas City	July 1, 1953-	40.75	43.75				
Board of Trade	Dec. 1, 1956	41.75	43.88	-1.14	2.51	17	-1.827
Soybeans	Nov. 1, 1948-	243	242⅛[2]				
Chicago Board of Trade	Sept. 1, 1953	259⅞	255⅞	9.23	21.55	26	2.141

* Note: the following is excerpted from a table of distribution of *t*:

N	Percentile value of *t* = .05
10	1.812
20	1.725
30	1.697

The formula for *t* is: $t = \frac{X - u}{s/\sqrt{N-1}}$, in which X is the mean profit or loss in the sample of hypothetical trades, u is zero (in testing the deviation from zero), *s* is the standard deviation of the sample of profits and losses, and N is the number of hypothetical trades in the sample.

[1] All prices are in cents per bushel excepting coffee (cents per pound) and bran (dollars per ton).

[2] In computing *t* for soybeans, adjustments, counted as separate observations, were made for price change. Thus, for example, in the last entry dealing with soybeans, the first purchase was at 242⅛ cents and the last sale at 259⅞ cents; so the difference of 17¾ cents was counted as a loss in a final, artificial trade.

Results are shown for one commodity over two separate periods:

(7) Bran, Kansas City Board of Trade, July 1, 1947 - March 1, 1952: $t = 2.079$
(8) Bran, Kansas City Board of Trade, July 1, 1953 - December 1, 1956: $t = -1.827$

Finally, the results shown above for soybeans are compared with results obtained for soybeans in an earlier period:

(4) Soybeans, Chicago Board of Trade, May 1, 1955 - July 1, 1959: $t = .107$
(9) Soybeans, Chicago Board of Trade, November 1, 1948 - September 1, 1953: $t = 2.221$

The general conclusion which is supported by all of these cases is that markets with relatively high levels of speculation are most effective for hedging and those with low levels of speculation are least effective for hedging. In the coffee market, the Minneapolis wheat market, and the Kansas City bran market, the amount of speculation ranges from little to negligible and the amount of hedging is a minor fraction of the potential that inheres in the volume of the respective commodity movements. Coffee importers who require a short hedge have paid a price for it, as have short hedgers in Minneapolis wheat futures. In bran, it is interesting to note that the market was first lopsided against the short side and then tipped the other way. With negligible professional speculation, hedging in the bran market has necessarily been highly speculative. Flour mills that sought a hedge during the years of high bran prices encountered reluctant futures buying on the part of merchants and feed mixers. Subsequently, these same merchants and feed mixers, in seeking to hedge sales or requirements at lower prices have encountered reluctant selling by the mllers. The millers' reluctance finally became complete, so to speak, in that they abandoned the market. While the immediate cause of the death of this market may be written in the coroner's report as the millers' departure, the underlying cause was the poor general state of health of a market which lacks speculation.

The soybean market was a relatively ineffective hedging medium during its rapid growth phase. Fortunately, hedgers were willing to support it through this phase, and they have been rewarded with an effective hedging medium as the market reached maturity. The proportion of open contracts reported as speculative was significantly lower during the growth phase than has since been the case.

The foregoing evidence is not complete in that it does not refer to all futures markets. I hasten to add that these are the only markets into which I have looked for evidence of this sort thus far, and that the evidence has as yet produced no surprises nor setbacks for the hypothesis that, to be effective for hedging, a futures market needs much speculation. Moreover, incomplete as is this evidence, it does represent a variety of situations, including different commodities at the same time, the same commodities at different times, and the same commodity on different markets.

Now Professor Phillips, writing to comment upon the copy of this paper that I had sent him, urged me to place this analysis in proper perspective with regard to the basis. His letter enabled me to see what I had not seen when I wrote the paper: that the results had not been presented in such a way as to relate them to ordinary usage and thinking on this subject. In consequence, the severity of the test which is here applied to futures markets might not be apparent at first glance, and some *less* severe test might be urged as being considered *more* severe.

A common, and accurate, expression, for example, is that the hedger is concerned with the basis, being as he is an arbitrager between cash and futures prices. Would it not therefore be appropriate, in evaluting the effectiveness of a market for hedging, to measure the basis? Indeed it has been suggested that what should be done is to measure the stability of the basis, and some earlier studies of hedging possibilities on futures markets compared the variability of the basis with the variability of cash prices. This particular form of the

measurement of basis stability is a meaningless test of futures market effectiveness because it presupposes *not* that most hedgers are arbitragers trying to get ahead in the world, which they are, but that they are a queer sort of conservative commercial idiot striving always and only to break even.

Having in mind as I did this meaningless concept of basis stability, I deliberately abjured the measurement of basis stability as such, and thereby deprived myself of the realization of the fact that I had indeed measured a meaningful basis characteristic that might easily be thought of as "basis stability." The measurements presented above in effect test whether or not the basis has an average value of *zero*. It is easy to see that this might be thought of as basis stability, although I had thought of stability as connoting minimum departures from an *unspecified* average value.

The hedger has no right to expect and no reason to want basis stability in the latter sense. Logically the basis should vary through time, hence he has no right to *expect* it not to. If it did not vary, most hedgers would be technologically unemployed, hence they have no reason to *want* it not to. Obviously, measurement of basis stability in this sense does not test the effectiveness of a market for hedging. Moreover, since absolute invariance cannot be desired in the basis, such a test is bound to be watered down to a comparison of basis variability with cash-price variability. All futures markets mentioned here, including those that were so lopsided that they died, easily pass this test of basis stability. Indeed, such an ineffective hedging medium as the coffee-futures market would appear not only effective in such a comparison, but *more* effective than the Chicago wheat-futures market.

In sharp contrast to measurements of the *comparative variability* of the basis, testing the basis for an average value of zero is a meaningful, severe, and discriminating test of the effectiveness of futures markets for hedging.

Had I realized that there was advantage to be gained from expressing the results in terms of the basis, I would also have given some consideration to another matter which Professor Phillips has urged me to discuss. It is not immediately apparent where the cash-price part of a basis computation is found in the present analysis. The cash-price series is carried in the futures-price series through the artifice of making all the paper transactions on the first trading day of the delivery month, i.e., the day on which, in general, the price of a futures contract has just become a commodity price. The basis in this analysis is the difference, on that day, between the price of the expiring future and that of the next future. The trading date is thus seen to have been chosen on economic grounds, as better than any other, rather than on the statistical ground of not worse than any other. There are economic arguments against both earlier and later dates for such a routine trade—for examples, hedge switching at earlier dates and delivery-month squeezes (fairly persistent in coffee over the period considered) at later dates. The routine "trading" procedure employed there is adequate to sustain the conclusions drawn from it; but this does not mean that further intensive study of other price relationships would not reveal other important economic characteristics.

Before summarizing my remarks, there are two related matters which deserve mention at this point. It has been convenient to speak of a futures market as though it were an inanimate mechanism with certain performance

characteristics. This is, of course, unrealistic. A futures market is no better than it is caused to be, by the people who regulate it and use it. Fortunately, most of the regulation is self-regulation by the users. They are in the best position to know when a contract is becoming one-sided and needs adjustment, when hedgers are being fairly and effectively served and when they are not. A well-balanced market neither springs into being full blown, nor does it remain in being without constant vigilance. Such markets as are maintained on the Chicago Board of Trade are testimonials to the hard work and dedication of many individuals. Markets which limp along or die may reflect negligence, apathy, chicanery, or lack of understanding on the part of those whose responsibility it is to maintain them. It is also true, however, that markets can wither and die despite the most persistant and enlightened efforts of their managers. No futures market can be an effective hedging medium when no hedging is being done; and certainly great reductions in hedging of numerous commodities have occurred through no fault of the markets.

Some of the regulation of futures markets has been not self-regulation, but regulation by government agency created by the Congress. In general this appears to me not to have been unduly onerous, but in one particular related to the evidence shown here it appears to me ominous. The Congress and the regulatory agency it created have both upon occasion displayed a penchant for thinking that the disease to which futures markets are prone is "too much speculation." Read the Congressional hearings on the coffee market, or on the onion and potato markets, or even some of the Commodity Exchange Authority's studies of the latter, and you will discover this tendency to find the fault of "too much speculation." Actually the lame and the halt among futures markets are characteristically afflicted with "too *little* speculation."

A few years ago one of the young Modesto ash trees in my yard appeared to be dying. The leaves turned brown and brittle in midsummer, then dropped off. The first diagnosis that I read described these symptoms exactly and said that many cases were being reported, owing to the unusually hot winds which were searing the leaves and drying the trees out faster than ground water could rise and restore the necessary moisture. The prescription was heavy and prolonged watering, which I immediately undertook, only to reverse the treatment abruptly when I read a second article. This second article described the particular wilt which had the aforementioned symptoms, and noted that the fungus which caused the wilt was favored by moisture around the roots. The prescription was of course to aerate and dry out the roots, thereby discouraging the fungus. This treatment was soon effective, whereas many who followed the opposite advice lost their trees. The authoritative article reminded the reader that this tree was native to California's hot and windy Central Valley and was highly drought resistant—appealing only to his common sense to suggest that whatever hot and dry winds were blowing in the San Francisco Bay area could be easily withstood by the Modesto ash.

The Modesto ash can quickly suffer and soon die from too much watering, but it is scarcely likely to suffer in the prevailing climate from lack of watering. *A futures market can quickly suffer and soon die from lack of speculation, but it is scarcely likely in the prevailing climate to receive too much speculation.* I think that the correct view has come to prevail regarding the Modesto ash tree despite the fact that a brown and withered leaf superficially suggests insufficient watering. The human mind can, after all, perceive certain

subtleties. But the official view of futures trading is still one, figuratively speaking, of watering a sick Modesto ash tree, the subtlety being as yet officially unperceived.

In summary, futures trading depends upon hedging. Any outside factor which reduces the need for hedging, such as government stockpiling, impairs futures markets by reducing the need for them. As the need is reduced, so the use is reduced, and reduction in use impairs usefulness. This is the acute and immediate and unsubtle threat to futures trading.

The chronic threat to futures trading is lack of understanding of the more subtle point that effectiveness for hedging depends upon speculation. Without hedging, it is true, there would be no futures trading; and the higher the level of hedging the higher the level of business on futures markets. *But the higher the level of business on futures markets the larger will be the proportion which is speculation, because the larger this proportion the more effective will be the market for hedging.*

The future of futures trading according to this analysis, depends upon two conditions. The first is the method by which farmers' incomes are supported. Some rationalization in this method, which would permit a larger scope for prices made on efficient free exchanges, and in particular would reduce government stockpiles, would stimulate futures trading. A number of techniques would have been proposed which go in this direction; but I will not venture to guess on the prospect for any such change. The second is the level of understanding of the function of futures markets—of the opportunities for hedging and the need for speculation. If and when a turning point does come in the farm program, it would be bitter irony to have it culminate in renewed attacks upon futures markets. Evidence of their dependence upon hedging, and of the effectiveness of the more speculative markets for hedging, needs to be stockpiled against this emergency.

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