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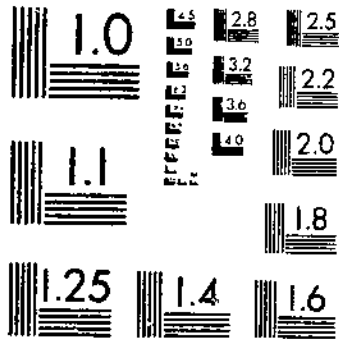
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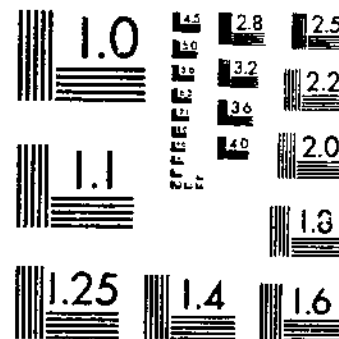
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Price Risks for

**WOOL and
WOOL PRODUCTS**
and Means of Reducing Them

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TECHNICAL BULLETIN NO. 1163

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WOOL AND WOOL PRODUCTS And Means of Reducing Them

BY L. D. HOWELL, *agricultural economist,
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SUMMARY AND CONCLUSIONS

Prices of wool, wool tops, and wool yarns and fabrics at times fluctuate widely over relatively short periods. Holding substantial quantities of these products from the time they are ready for market until they are needed by consumers involves both risks of loss from declines in prices and possibilities of gain from advances in prices. The main purpose of this bulletin is to show the nature and extent of the risks from these changes in prices and to indicate means of improving the marketing of wool and wool products by reducing or offsetting these risks.

Losses and gains from changes in prices of domestic wool over 16-week periods may be greater than total costs involved in taking wool from farms and ranches and delivering it to topmakers or mills. In 1950 and 1951, when prices of wool were enough higher than the Government price-support level to permit freedom of price movement, these losses and gains averaged more than the total costs of marketing raw wool. The corresponding changes in prices of wool tops and of wool yarns and fabrics were greater than those for wool. An alternative to taking the gains and suffering the losses on market interests in these commodities, as a result of changes in prices, is to offset them through the use of futures contracts as hedges.

Dealers, merchants, and others can hedge their long- or short-market interests in wool or wool tops by offsetting sales or purchases of futures contracts. Topmakers, manufacturers, and others may use futures markets in obtaining direct hedges against losses from changes in prices, or they may obtain essentially the same protection by buying or selling wool or wool tops on call. Small dealers, farmers, and ranchmen as a rule do not hedge their wool, but most of them sell promptly and pass on the risks from changes in prices to the larger dealers, merchants, or topmakers.

Effectiveness of futures trading in reducing or offsetting risks from changes in spot prices of wool and wool products depends mainly upon the extent to which these changes are associated with similar changes in prices of futures contracts. During the 8 years ended 1954, a large proportion of the changes in spot prices of wool and of wool tops in Boston, particularly when prices of wool were substantially above the Government price-support level, was associated with similar changes in prices of futures contracts. Because of the value added by manufacture and of other factors, changes in prices of wool yarns and fabrics usually were not so closely related to changes in prices of futures contracts as were changes in spot prices of wool and wool tops.

Relations of changes in spot prices of wool and of wool products to changes in prices of futures contracts are affected by several factors. Abnormally large market supplies of wool and wool products, when relatively smaller supplies are anticipated, tend to depress spot prices in relation to prices of futures contracts, particularly for the more distant months. Shortages of these commodities immediately available, along with the anticipation of relatively larger supplies, tend to raise spot prices in relation to prices of futures contracts, particularly for the more distant months.

Disparities between changes in spot prices of wool and wool products and in prices of futures contracts at times result in considerable changes in spot-futures price spreads, referred to as "basis." Gains and losses from changes in basis are not offset by the normal hedging procedure. A practical consideration, in evaluating the usefulness of futures contracts as hedges against losses from changes in spot prices, is concerned with determining how the risks from changes in spot prices compare with risks from changes in basis.

Comparisons of changes in spot prices with changes in basis show that, during the 8 years ended with 1954, changes over 16-week periods in spot prices averaged about 36 percent greater for territory fine staple combing wool, and 61 percent greater for wool tops (64s oil combed), in Boston than the corresponding changes in basis. In 1950 and 1951, when prices of wool were substantially above the Government price-support level, changes over 16-week periods in spot prices averaged about 3.5 times as great for this wool, and 3.8 times as great for the wool tops, as the corresponding changes in basis. These proportions are fairly typical of those for other qualities of wool.

Futures contracts afforded less hedge offset for wool yarns and fabrics than for wool and wool tops. Changes in prices of the quantity of wool yarns and fabrics obtainable from a pound of wool, over 16-week periods ended in 1950 and 1951, when wool prices averaged substantially above the price-support level, averaged somewhat greater than the corresponding changes in spread between prices of these products and prices of wool top futures contracts. In other years, when wool prices approximated the price-support level, changes in these spot-futures price spreads averaged about as great as or greater than the corresponding changes in spot prices of these products.

Gains and losses from transferring hedges and from straddle transactions (for description of straddle operations see page 79) may be used to supplement or offset gains and losses from changes in spot prices and in basis. Losses on sales on call, and on long-hedged positions, based on futures contracts that are relatively high in price, for example, and losses on purchases on call, and on short-hedged positions, based on futures that are relatively low in price, may be offset, at least in part, by gains from straddle operations. Normal straddle operations in conjunction with such hedged positions, when based on the same futures contracts, result in the transfer of hedges.

Trading in futures may give some protection from changes in prices of wool and of wool products, aside from offsets through hedges, by reducing the amount of the price changes. Some students of futures trading have concluded that trading in futures by competent

speculators tends to result in smaller but more frequent changes in prices. Others contend that conclusive evidence is lacking with respect to whether prices are in any measure leveled as a result of trading in futures.

Any influence that trading in futures may have on the average level of prices of wool and wool products comes mainly from its influence on costs of marketing, manufacturing, and distributing wool and wool products. Futures trading makes possible a reduction in these costs by supplying means for reducing risks from changes in prices and for making savings in financing.

Benefits of reductions in risks and in capital costs are offset to some extent by direct charges for trading in futures, the bulk of which are represented by commissions. Any net savings in marketing and manufacturing costs, as a result of futures trading, would make possible a reduction in margins necessary for marketing, manufacturing, and distributing wool and wool products. Available information is not adequate to show to what extent any such savings are passed on to farmers and ranchmen in the form of higher prices or to consumers of wool products in the form of lower prices, but it appears reasonable to believe that both producers and consumers would be benefited by such savings.

INTRODUCTION

Prices of raw wool, wool tops, and wool yarns and fabrics sometimes fluctuate widely during relatively short periods. Changes in these prices are accounted for mainly by changes in the demand-and-supply situation for these products and in the purchasing power of the monetary unit in terms of which the prices are expressed (17, 9).¹

Most of the domestic wool clip is shorn from February to July, inclusive, and usually most of the farm producers sell their wool at or soon after shearing time; hence, the greater proportion of shorn wool produced in the United States is sold by producers in the spring and summer. Manufacturers of wool products usually are not disposed to buy their whole year's requirements of raw wool during this short period. In addition, substantial stocks of domestic pulled wool and of imported wool usually are held by dealers. Consequently, these dealers ordinarily hold substantial quantities of wool from the time it is sold in the United States until it is needed by manufacturers. Such holding of wool involves both risks of losses from declines in prices and possibilities of gains from advances in prices.

Manufacturers of wool products may not find it feasible to buy raw wool and to sell simultaneously the tops, yarns, and fabrics to be made from it, or to sell these products and to buy simultaneously raw wool for use in their manufacture. Consequently, they may buy raw wool at fixed prices long before the products made from it are sold at fixed prices, or they may sell these products at fixed prices long before they buy the raw wool at fixed prices. These operations result in risks of losses, as well as possibilities of gains, from changes in prices.

¹ Italic numbers in parentheses refer to Literature Cited, p. 96.

Wool dealers and manufacturers of wool products usually specialize in merchandising raw wool and in manufacturing tops, yarns, and fabrics, respectively, and generally they are not in a favorable position to assume the risks of losses from changes in prices. Consequently, they may make use of futures markets in offsetting their risks of losses from price changes through hedging operations or through buying and selling "on call" (see p. 39).

Wool dealers may hedge their long- or short-market interests² in raw wool by offsetting sales or purchases of futures contracts.³ Manufacturers of wool products may make use of futures markets in obtaining direct hedges against losses from changes in prices or they may buy raw wool or wool tops on call, leaving hedging largely to dealers and topmakers. Small local buyers of wool and farmers, as a general rule, do not use the futures market in hedging, but most of them sell promptly, passing on the risks from price changes to the larger dealers or manufacturers.

Trading in futures consists either of assuming risks of loss and possibilities of gain from changes in prices, as speculators do, or of attempting to offset these risks, as hedgers do. The term "speculation" in common business usage is generally applied to the field of ventures the outcome of which is relatively uncertain and, hence, from which profits or losses are likely to be large (18). In futures trading, it is applied particularly to attempts to make profits by voluntarily assuming risks of loss, along with possibilities of gain, from changes in prices. The success of the speculator depends mainly upon his buying and selling on the basis of an accurate anticipation of changes in prices.

Hedgers in the wool industry include principally dealers and manufacturers who buy and sell wool or wool top futures to offset risks involved in later changes in prices. Dealers mainly sell futures (short hedges) to protect purchases of raw wool against the possibility of declines in prices before the wool is sold at fixed prices. At times, however, they may sell raw wool for forward delivery at fixed prices and buy futures (long hedges) to protect themselves against a possible advance in prices before the wool is bought. Manufacturers, on the other hand, may buy futures as a hedge against a possible rise in prices of wool when they have sold tops, yarns, or fabrics ahead and are not able or are not disposed to purchase simultaneously the wool required. They may also sell futures as a hedge against losses from a possible decline in prices when wool or wool tops is bought at fixed prices before the products are sold and their prices fixed.

Purpose of This Bulletin

The main purposes of this bulletin are: (1) To show the nature and extent of the risks of loss and possibilities of gain from changes in prices of raw wool, wool tops, and selected wool yarns and fabrics;

²The term "market interest," as used in this bulletin, refers to the quantity of the products purchased at fixed prices or otherwise owned (long-market interest) and that sold "short" at fixed prices (short-market interest).

³The expressions "buying or selling futures or futures contracts" are used in this bulletin to mean entering into a contract to buy or to sell wool or wool tops for delivery during a specified month in accordance with the rules and regulations of futures exchanges.

(2) to ascertain to what extent futures trading and alternative means afford protection by reducing or offsetting the risks of loss from changes in prices through hedging and other operations; (3) to indicate the influence of various factors on the spot-futures price relationships and protection afforded by futures as hedges; (4) to show risks of loss and possibilities of gain from transferring hedges and from straddle transactions; (5) to indicate the influence of trading in futures on fluctuations in spot prices; and (6) to give some indications of the effects of futures trading on farm prices of wool, on costs of marketing, and on costs of wool products to consumers.

Method of Procedure and Scope of Study

Risks of loss and possibilities of gain from changes in prices of raw wool, wool tops, and selected wool yarns and fabrics; protection afforded by futures as hedges; and gains and losses from transferring hedges and from straddle transactions are indicated in this bulletin by changes in prices and in price spreads over specified periods. No attempt was made to weight these changes by the extent of the operations of individuals in the market, as was done on a limited scale in "A Study of Cotton Hedging for a Grey Goods Mill, 1921-26" (23). Such weighting to show results of actual operations has certain desirable features, but data to show average results of these operations would need to include details of all transactions for a representative sample of operators during a representative period of time, and such data are not readily available. Problems involved in selecting a representative sample of operators, in making satisfactory arrangements for obtaining from each operator detailed data for all transactions during a representative period, and in tabulating and analyzing these data apparently are such as to make this approach impracticable.

Account was taken of the fact that price risks for raw wool and wool products may be influenced by price-support and surplus-removal programs (including subsidies to domestic producers) and price ceilings and floors. Attention is called to the influence of some of these programs, particularly price support, on price risks involved and on protection afforded by futures as hedges, but no comprehensive analyses of these programs were attempted in connection with this study.

Results presented in this bulletin are based mainly on analyses of data for the 8 years 1947-54 relating to (1) spot prices at the end of the week of selected qualities of domestic wool and of wool tops in Boston; (2) closing prices at the end of the week of wool futures and of wool top futures in New York; (3) spot prices on the 15th of the month of selected wool yarns and fabrics as reported by the Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarns and fabrics obtainable from a pound of wool; and (4) closing prices on the 15th of the month of wool top futures in New York. Many of the quotations for spot prices of wool and of wool tops were "nominal" because of insufficient sales for arriving at actual prices or values of these products. It is not known whether or to what extent actual prices or values of these products may have differed from the "nominal" prices quoted.

Quotations at the end of the week and on the 15th of the month are considered to represent a fairly typical cross section of prices from time to time for these commodities. It is recognized that closing prices vary considerably from day to day and that prices during the day may vary considerably from those at the close of the market. Furthermore, closing prices at the end of the week and on the 15th of the month do not reflect all variations in prices registered on the wool and wool top futures exchanges or in prices at which wool, wool tops, and selected wool yarns and fabrics were sold in the specified markets. Consequently, the results obtained from the use of these data are considered to represent fairly typical averages. They may show considerably more or less gains and losses from price changes and hedge protection afforded by futures than were actually obtained by some individuals in making specific transactions.

Obviously, those who were skilled in predicting changes in prices of raw wool, wool tops, and yarns and fabrics and in "basis" may have been able to obtain greater gains and to suffer less losses from price changes, to realize more hedge protection, and to make greater gains and take smaller losses from transferring hedges and from straddle transactions than the average results of this study show. On the other hand, those who were less able to predict changes in prices and in basis may have realized less hedge protection and had greater losses or made less gains from changes in prices than indicated by the average results.

The number of observations used in the analyses usually amounted to one each week for the data relating to wool and wool tops and to one each month for the data relating to yarns and fabrics. Differences in spot prices of raw wool and wool tops and in spread between these prices and prices of futures contracts at the end of the week, separated by 8-, 16-, and 24-week periods, were used to show gains and losses from changes in prices of these products and from changes in basis. Differences in spot prices of wool yarns and fabrics and in spread between these prices and prices of wool top futures on the 15th of the month, separated by 2-, 4-, and 6-month periods, were used to show gains and losses from changes in prices of these products and from changes in spread between these prices and prices of wool top futures. Changes in spread between prices of two futures contracts for the same and different markets at the end of the week, separated by 16-week periods, were used to show gains and losses from switching hedges and from straddle transactions.

Simple averages of these differences were calculated, and no attempt was made to use weights based on estimates of the quantity of hedges. Substantial changes during the year in the quantity of hedges for wool and wool tops are indicated by data showing open commitments, semimonthly, of large merchants and mills in connection with their long and short hedging commitments as reported by the Commodity Exchange Authority (28). The provisions of the Commodity Exchange Act were made applicable to wool as of October 1954 and limited data relating to the quantity of hedges for wool are available. The published data on hedging commitments in wool tops are not

*The term "basis," as employed in this bulletin, means the difference or spread at a specified time between the spot price of raw wool or wool tops of a specified quality in a given market and the price of a specified futures contract.

shown separately for each futures contract and consequently they do not provide an adequate basis for weighing the relative hedging importance of the various futures in estimating gains and losses per pound of wool tops. Calculation of total gains and losses of all dealers and mills from hedging operations is not possible from the hedging commitment data, as they do not include commitments of dealers and mills whose futures operations are smaller than the reporting requirements. Data showing length of hedging periods are not available, and periods of 8, 16, and 24 weeks for wool and wool tops, and of 2, 4, and 6 months for yarns and fabrics were arbitrarily selected for use in this study.

Gains and losses are shown in cents a pound for wool and wool tops and in cents for the quantity of wool yarns and fabrics obtainable from a pound of wool. Gains and losses from changes in spot prices, from changes in basis, from transferring hedges, and from straddle transactions are shown separately. It is recognized, of course, that individual dealers or manufacturers may engage in one or more types of operations involving long- or short-market interests in the spot commodity not hedged, long or short interests in the spot commodity offset by sales or purchases of futures contracts, the transfer of hedges from one futures contract to another, and straddle transactions between futures months and markets. Gains and losses from one type of operation may be supplemented or offset, in whole or in part, by those from other types of operations.

Furthermore, operations in spot and futures markets may be parts of larger business combinations involving a variety of other types of operations. Gains and losses from one of these types of operations may be supplemented or offset, in whole or in part, by those of another, thus conforming to the principle of hedging in the broader sense. It might be helpful in evaluating, from a broad viewpoint, the protection afforded by trading in wool and wool top futures, to know under what conditions and to what extent dealers in wool and manufacturers of wool products supplement or offset their gains and losses from other types of operations by gains and losses from trading in futures. But the information available for this study is not adequate to show the extent to which futures trading constitutes parts of larger operations, or to indicate to what extent gains and losses from these other operations may be supplemented or offset by those from trading in futures.

RISKS FROM CHANGES IN SPOT PRICES

Risks of loss, as well as possibilities of gain, from changes in prices of raw wool, wool tops, and wool yarns and fabrics are functions of market interests in the products, combined with the probability of changes in prices.

Extent of Market Interests

The extent of the market interests in raw wool may be indicated by data which show that total stocks of apparel wool held near the end of March by dealers and manufacturers in the United States ranged from 130 million pounds (scoured basis) in 1951 to 404 million in 1947 and averaged about 207 million during the 8 years ended with

1954 (24). Domestic wool constituted, on the average, about 58 percent of these stocks. Dealers held, on the average, about 52 percent and manufacturers about 48 percent of total stocks.

Stocks of wool tops at the end of March held by dealers, top makers, and manufacturers in the United States ranged from 24 million pounds in 1954 to 41 million in 1949 and averaged 29 million pounds during the 8 years ended with 1954 (24). Similar data for noils show that total stocks ranged from about 12 million pounds in 1953 to 18 million in 1949 and averaged about 15 million pounds.

During the 5 years 1950-54, stocks of sales yarn spun on the French system, wholly or in part from uncut tops of wool and similar fibers, averaged about 194,000 pounds for weaving yarns and 439,000 for knitting yarns. During the same period, stocks of sales yarn held by 47 firms, which in recent years accounted for more than half of the yarns spun on the Bradford system, averaged 246,000 pounds for weaving yarns and 600,000 pounds for knitting yarns, spun wholly or in part from uncut tops of wool and similar fibers. Unfilled orders for each type of yarn averaged several times greater than stocks.

During the 3 years 1952-54, stocks of apparel fabrics containing 25 percent or more of wool, by weight, held by 75 firms in the United States, averaged about 10 million linear yards of finished cloth and 5 million linear yards of unfinished cloth (24). These firms in recent years produced about half of the apparel fabrics of this kind woven in the United States. Unfilled orders for these fabrics held by these firms averaged much greater in volume than stocks of finished and unfinished fabrics.

It is apparent from these data that market interests in raw wool, wool tops, and wool yarns and fabrics usually are great enough to result in large gains or losses from substantial changes in prices of these products.

Extent of Changes in Spot Prices

Data relating to changes in prices of raw wool, wool tops, and wool yarns and fabrics are presented in the order listed.

Raw wool.—Quoted prices of wool in Boston at times show large changes during relatively short periods (fig. 1). In 1951, for example, spot prices of territory fine staple combing wool in Boston declined from \$3.80 a pound (clean basis) in March to \$1.75 in September, a decline of \$2.05 within less than 6 months. In 1952, these prices declined from \$1.93 a pound in January to \$1.55 in April, a decline of 38 cents within about 3 months, and in 1949 they declined from \$1.80 a pound in May to \$1.53 in August, a decline of 27 cents within 3 months. These prices advanced from \$1.88 a pound in August 1950 to \$3.80 in March 1951, an advance of \$1.92 within 7 months. In 1948, these prices advanced from \$1.31 a pound in May to \$1.78 in June, an advance of 47 cents within less than 1 month.

During the 8 years ended December 1954, changes over 16-week periods in quoted prices of territory fine staple combing wool in Boston amounted to as much as \$1.38 a pound (clean basis) and they averaged 17 cents (table 1). These changes amounted to 15 cents or more a pound 30 percent of the time, 25 cents or more 22 percent of

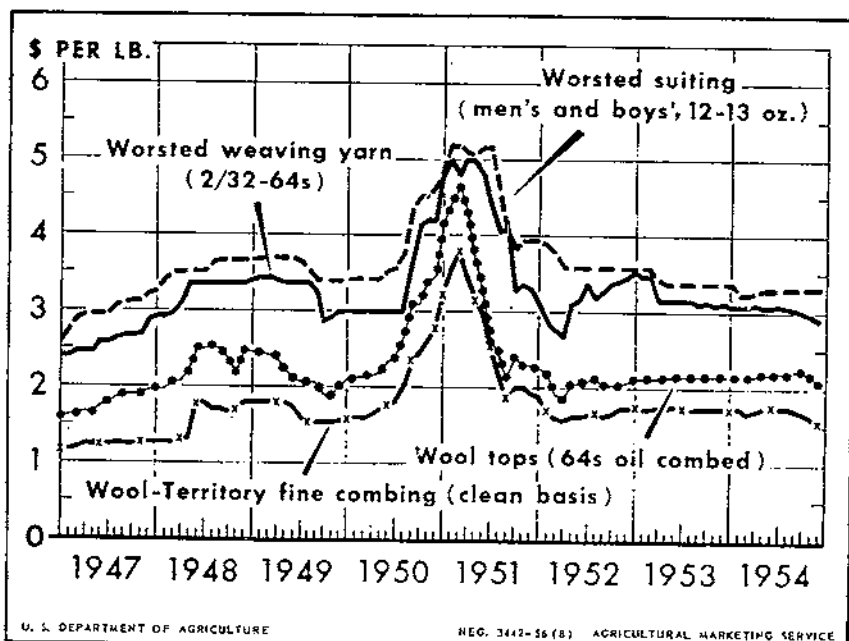


FIGURE 1.—Spot prices of territory fine staple combing wool and of wool tops (64s oil combed) in Boston, and wholesale prices of worsted weaving yarn (2/32s-64s) and men's and boys' worsted suiting (12-13 oz.), as reported by Bureau of Labor Statistics, 1947-54. Prices of wool and of wool products at times change considerably over relatively short periods, particularly as in 1950 and 1951 when wool prices were substantially above the Government price-support level. In other years when wool prices were near the price-support level, changes in prices of wool and wool products were relatively small.

the time, and 45 cents or more 14 percent of the time. A substantial proportion of these changes were large enough to result in gains or losses from price changes larger than total merchandising costs involved in taking wool from farms and ranches and delivering it to top makers and manufacturers.

Changes over 16-week periods in quoted prices of wool in Boston varied widely from one year to another (table 1). These changes varied, for the most part, directly with the extent to which farm prices of wool exceeded the Government price support level. In 1951, when farm prices averaged about 90 percent above the price support level, changes over 16-week periods in quoted prices of territory fine staple combing wool in Boston ranged up to \$1.38 a pound and averaged 67 cents. In 1950, when farm prices averaged about 37 percent above the price support level, changes over 16-week periods in prices of territory fine combing wool amounted to as much as 74 cents a pound and averaged about 32 cents. When average farm prices of wool approximated the price-support level, as in 1947, 1952, 1953, and 1954, changes in prices of wool usually were small. In 1948 and 1949, farm prices of wool averaged about 16 percent above the price support level and changes over 16-week periods in quoted prices of territory fine staple combing wool in Boston averaged about 18 and 11 cents a pound, respectively.

TABLE 1.—Changes over 16-week periods in spot prices of territory fine staple combing wool in Boston, 1947-54¹

Item	1947	1948	1949	1950	1951	1952	1953	1954	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -45.0					53.0				4.4
-45.0 to -35.1					3.2	9.6			1.6
-35.0 to -25.1			11.6		6.2	15.4			4.2
-25.0 to -15.1			19.2		6.2	7.7			5.0
-15.0 to -5.1		15.1	19.2		3.2	5.8		5.7	8.1
-5.0 to 4.9	73.0	39.6	26.9	9.6	3.2	23.1	82.7	66.0	41.3
5.0 to 14.9	27.0	15.1	19.2	26.9	6.2	36.5	17.3	11.3	20.4
15.0 to 24.9			3.9	17.3		1.9			3.1
25.0 to 34.9				5.8					.8
35.0 to 44.9		5.7		3.8					1.3
45.0 to 54.9		24.5		7.7	3.2				4.7
55.0 and over				28.9	15.6				5.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	73.0	60.4	28.8	98.1	25.0	59.6	50.0	26.4	53.3
Loss ²	21.6	18.9	50.0	0	75.0	40.4	25.0	50.9	33.7
Average change	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
	3.0	17.7	10.8	31.7	67.3	14.4	2.6	5.0	17.1
Gain	3.8	26.8	8.8	32.3	59.6	6.3	4.2	3.6	17.5
Loss	1.0	8.2	16.6	0	69.9	26.3	1.8	8.0	23.2
Maximum:									
Gain	8.0	52.0	15.0	74.0	110.0	15.0	11.0	7.0	110.0
Loss	1.0	13.0	27.0	0	138.0	39.0	3.0	21.0	138.0

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc.

² Gain and loss on long market interests in wool not hedged.

Changes over 16-week periods in quoted prices of territory fine staple combing wool in Boston vary considerably from one part of the year to another, but no very clear-cut seasonal patterns of price changes are indicated (table 2). During the 8 years ended December 1954, price changes over 16-week periods ended July, August, and September were greatest and the declines averaged substantially greater than the advances. The greater declines than advances in prices during this part of the season may be accounted for in part by the fact that a large proportion of domestic wool is marketed in the spring and summer. Changes over 16-week periods ended October and November averaged substantially greater than those for similar periods ended December to June, inclusive, and the advances averaged greater than the declines.

Changes in prices of territory fine staple combing wool are fairly typical of the changes in prices of other qualities of wool (table 3). During the 8 years ended December 1954, changes over 16-week periods in prices of territory fine staple combing wool averaged somewhat less

TABLE 2.—Changes over 16-week periods in spot prices of territory fine staple combing wool in Boston, by specified periods, 1947-54¹

Item	Changes for periods ended—					
	July-Sept.	Oct.-Nov.	Dec.-Feb.	Mar.-Apr.	May-June	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -45.0.....	8.9	11.5				4.4
-45.0 to -35.1.....			1.1	7.0	1.6	1.6
-35.0 to -25.1.....	5.9	1.4	3.3	7.0	3.2	4.2
-25.0 to -15.1.....	6.9	4.3	6.5		4.8	5.0
-15.0 to -5.1.....	1.0	25.7	4.3	1.8	11.1	8.1
-5.0 to 4.9.....	39.6	37.1	43.5	54.3	33.3	41.3
5.0 to 14.9.....	13.9	8.6	28.2	26.3	27.0	20.4
15.0 to 24.9.....	2.0		3.2		11.1	3.1
25.0 to 34.9.....	3.0					.8
35.0 to 44.9.....	3.9				1.6	1.3
45.0 to 54.9.....	10.9		2.2	1.8	6.3	4.7
55.0 and over.....	4.0	11.4	7.7	1.8		5.1
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	55.4	32.9	65.2	43.9	63.5	53.3
Loss ²	35.6	64.3	17.4	29.8	23.8	33.7
Average change.....	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
	25.8	20.1	13.9	9.4	11.7	17.1
Gain.....	22.1	27.0	16.2	0.2	12.8	17.5
Loss.....	37.9	17.5	19.1	18.1	15.0	23.2
Maximum:						
Gain.....	67.0	74.0	110.0	62.0	52.0	110.0
Loss.....	138.0	102.0	39.0	39.0	42.0	138.0

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool not hedged.

than the corresponding changes in prices of territory one-half blood staple combing, bright fleece fine staple combing, and bright fleece one-half blood combing wools. They averaged somewhat more than the corresponding changes in prices of territory one-half blood staple combing wool. The size distribution of the price changes for territory fine staple combing wool, as indicated in table 3, was similar to that for wool of other qualities.

The extent of the changes in prices of wool vary considerably with the length of the period. Results of analysis of data relating to quoted prices of territory fine staple combing wool in Boston show that, during the 8 years ended December 1954, changes in prices over 8-week periods averaged about 10 cents a pound, those for 16-week periods averaged about 17 cents, and those for 24-week periods averaged 23 cents.

Wool tops.—Changes in prices of wool tops in Boston show trends similar to, but the fluctuations usually were greater than, those indicated for prices of raw wool (fig. 1). Quoted prices of wool tops (64s oil combed) in Boston declined from \$4.73 a pound in April 1951 to

TABLE 3.—Changes over 16-week periods in spot prices of wool of specified qualities in Boston, 1947-54¹

Item	Territory combing			Bright fleece staple combing	
	Fine staple	½ blood staple	¼ blood	Fine	½ blood
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -45.0	4.4	4.7	4.8	6.3	5.8
-45.0 to -35.1	1.6	3.2	1.2	1.0	3.0
-35.0 to -25.1	4.2	2.5	3.0	3.5	1.7
-25.0 to -15.1	5.0	5.7	3.5	6.7	6.0
-15.0 to -5.1	8.1	6.2	8.4	9.4	8.4
-5.0 to 4.9	41.3	43.0	55.8	35.0	38.7
5.0 to 14.9	20.4	17.6	10.4	20.1	20.4
15.0 to 24.9	3.1	3.2	3.2	2.7	3.5
25.0 to 34.9	.8	2.5	1.0	3.2	1.7
35.0 to 44.9	1.3	3.2	2.7	.7	4.5
45.0 to 54.9	4.7	2.0	.7	3.2	1.0
55.0 and over	5.1	6.2	5.3	8.2	5.3
Total	100.0	100.0	100.0	100.0	100.0
Gain ²	53.3	49.4	37.0	58.3	48.9
Loss ²	33.7	42.7	43.2	33.0	41.2
Average change	<i>Cents</i> 17.1	<i>Cents</i> 19.7	<i>Cents</i> 15.8	<i>Cents</i> 21.4	<i>Cents</i> 19.3
Gain	17.5	21.2	22.1	19.9	20.7
Loss	23.2	21.5	17	29.5	22.2
Maximum:					
Gain	110.0	129.0	126.0	109.0	130.0
Loss	138.0	137.0	125.0	143.0	133.0

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc.

² Gain and loss on long market interests in wool not hedged.

\$2.05 in September, a decline of \$2.68 a pound within about 5 months. In 1948, these prices declined from \$2.53 a pound in September to \$2.15 in November, a decline of 38 cents within about 2 months, and in 1949 they declined from \$2.48 a pound in March to \$2.08 in June, a decline of 40 cents within about 3 months. These prices advanced from \$2.33 a pound in July 1950 to \$4.70 in March 1951, an advance of \$2.37 within about 8 months. In 1948, these prices advanced 45 cents a pound from April to June and 35 cents from November to December.

During the 8 years ended December 1954, changes over 16-week periods in quoted prices of wool tops (64s oil combed) in Boston amounted to as much as \$1.90 a pound and they averaged 22 cents (table 4). These changes amounted to 15 cents or more a pound about 45 percent of the time, 25 cents or more 27 percent of the time, and 45 cents or more about 12 percent of the time. Some of these changes are as large as or larger than the topmakers' gross processing margins and many of them are much larger than net profits margins normally to be expected from the manufacture of wool tops.

Changes in prices of wool tops (64s oil combed) varied widely from one year to another (table 4). The extent of the changes in prices of wool tops, as indicated above for prices of raw wool, varied directly with the extent to which farm prices of wool exceeded the Government price support level for wools. In 1951, when farm prices of wool averaged about 90 percent above the price support level, changes over 16-week periods in prices of wool tops (64s oil combed) in Boston ranged up to \$1.70 a pound and they averaged about 72 cents. In 1950, when farm prices of wool averaged 37 percent above the price support level, changes over 16-week periods in prices of wool tops amounted to as much as 88 cents a pound and they averaged about 41 cents. When average farm prices of wool approximated the price support level, as in 1947, 1952, 1953, and 1954, changes in prices of wool tops usually were small.

The extent of the fluctuations in prices of wool tops varied considerably from one part of the year to another, but no definite seasonal patterns were indicated (table 5). For the 8 years ended 1954, taken as a whole, changes in prices of wool tops were greatest for 16-week periods ended during the spring and summer when the volumes of sales of wool by farmers and ranchmen were greatest. Decline in prices of wool tops during this period averaged substantially greater than the advances. Changes in prices of wool tops over 16-week periods ended October through February averaged about 19 cents a pound and the advances averaged greater than the declines.

Changes in prices of wool tops vary directly with the length of the period considered. Data relating to quoted prices of wool tops (64s oil combed) in Boston show that during the 8 years ended December 1954, changes in these prices over 8-week periods averaged 14 cents a pound, changes over 16-week periods averaged 22 cents a pound, and changes over 24-week periods averaged 28 cents a pound.

Wool yarn.—Data relating to prices of selected wool yarns on the 15th of the month, as reported by the Bureau of Labor Statistics, show substantial changes over relatively short periods (figure 1, p. 9). Prices of worsted weaving yarn, for example, advanced from \$2.97 a pound in August 1950 to about \$6 in April 1951, an advance of more than \$3 within about 8 months. These prices declined from about

TABLE 4.—Changes over 16-week periods in spot prices of wool tops (6½s oil combed) in Boston, 1947-54¹

Item	1947	1948	1949	1950	1951	1952	1953	1954	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -45.0					37.5	1.9			3.4
-45.0 to -35.1			11.5			17.3			3.9
-35.0 to -25.1		7.5	15.4		15.6	5.8			5.2
-25.0 to -15.1		5.7	21.2		25.0	7.7		3.8	7.3
-15.0 to -5.1		5.7	21.2			13.5		9.4	6.8
-5.0 to 4.9	5.4	7.6	9.6	1.9	3.1	25.0	76.9	66.0	26.4
5.0 to 14.9	54.0	30.2	11.5	19.2		1.9	23.1	20.8	19.9
15.0 to 24.9	35.2	11.3	3.8	30.8	3.1	15.4			12.0
25.0 to 34.9	5.4	7.5	5.8	1.9		11.5			4.2
35.0 to 44.9		7.5		5.8					1.8
45.0 to 54.9		17.0		5.8					3.1
55.0 and over				34.6	15.7				6.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	100.0	73.6	21.2	100.0	18.8	28.8	67.3	47.2	57.5
Loss ²	0	26.4	78.8	0	81.2	71.2	3.8	15.1	33.4
Average change	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Gain	12.8	22.3	20.0	40.6	71.9	19.4	3.2	3.9	22.2
Loss	0	17.6	20.5	0	67.9	18.9	1.0	12.8	28.8
Maximum:									
Gain	25.0	50.0	33.0	88.0	130.0	28.0	10.0	6.0	130.0
Loss	0	35.0	40.0	0	170.0	51.0	1.0	19.0	170.0

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool tops not hedged.

TABLE 5.—Changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston, by specified periods, 1947-54¹

Item	Changes for periods ended—					
	July- Sept.	Oct.- Nov.	Dec.- Feb.	Mar.- Apr.	May- June	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -45.0-----	8.9	2.9		1.8	1.6	3.4
-45.0 to -35.1-----	2.0		1.1	10.5	9.5	3.9
-35.0 to -25.1-----	4.9	10.0	2.1	1.8	8.0	5.2
-25.0 to -15.1-----	2.0	17.1	10.4	3.5	3.1	7.3
-15.0 to -5.1-----	4.9	14.3	5.2	5.2	4.8	6.8
-5.0 to 4.9-----	19.8	30.0	27.1	24.5	31.7	26.4
5.0 to 14.9-----	12.9	10.0	29.2	31.6	15.9	19.9
15.0 to 24.9-----	13.9	4.3	10.4	15.8	15.9	12.0
25.0 to 34.9-----	11.9		1.0	3.5	1.6	4.2
35.0 to 44.9-----	4.9				31.1	1.8
45.0 to 54.9-----	7.9		1.0		4.8	3.1
55.0 and over-----	6.0	11.4	12.5	1.8		6.0
Total-----	100.0	100.0	100.0	100.0	100.0	100.0
Gain ² -----	70.3	30.0	55.2	61.4	69.8	57.5
Loss ² -----	28.7	54.3	31.3	22.8	28.6	33.4
Average change-----	<i>Cents</i> 33.3	<i>Cents</i> 21.2	<i>Cents</i> 22.2	<i>Cents</i> 16.1	<i>Cents</i> 17.8	<i>Cents</i> 22.2
Gain-----	24.8	35.5	32.7	14.6	13.3	21.9
Loss-----	55.4	19.5	13.3	31.0	29.7	28.8
Maximum:						
Gain-----	85.0	88.0	135.0	80.0	50.0	130.0
Loss-----	170.0	80.0	40.0	51.0	75.0	170.0

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool tops not hedged.

\$6 a pound in May 1951 to \$3.25 in October, a decline of \$2.75 within about 5 months. Other changes are indicated by the data presented in figure 1.

Similar data for worsted knitting yarn show that prices advanced from \$1.92 a pound in March 1950 to \$3.85 in March 1951, an advance of \$1.93 a pound within a year. These prices declined from \$3.85 in March 1951 to \$2.35 in September, a decline of \$1.50 within about 6 months. Changes in prices of these yarns, as well as in prices of wool and wool tops, were greater in 1950 and 1951 than during any other recent year.

During the 8 years 1947 to 1954, inclusive, changes over 4-month periods in value of the quantity of worsted weaving yarn obtainable from a pound of wool ranged up to \$1.72 and averaged 29 cents (table 6). These changes amounted to 25 cents or more 35 percent of the time, 35 cents or more 26 percent of the time, and 45 cents or more 19 percent of the time. Similar data for worsted knitting yarn show that, during the 8 years ended with 1954, changes over 4-month

periods in value of the quantity of this yarn obtainable from a pound of wool ranged up to 93 cents and averaged about 12 cents (table 6). These changes amounted to 25 cents or more about 17 percent of the time, 35 cents or more 11 percent of the time, and 45 cents or more 9 percent of the time.

Extent of changes over 4-month periods in prices of wool yarns varied considerably from year to year and from one part of the season to another. During the 8 years 1947 to 1954, inclusive, average changes over 4-month periods in value of the quantity of worsted weaving yarn obtainable from a pound of wool ranged from about 4 cents in 1954 to about \$1.28 in 1951. These changes varied considerably from one part of the year to another but no very consistent seasonal pattern was indicated. Average changes in these values ranged from 16 cents for 2-month periods to 38 cents for 6-month periods.

TABLE 6.—Changes over 4-month periods in spot prices of specified wool yarns and fabrics, 1947-54¹

Item	Worsted yarn		Suiting, men's and boys'	
	Knitting	Weaving	Woolen flannel	Worsted
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Change in cents per pound:				
Under -35.0.....	4.5	13.6	3.4	5.6
-35.0 to -25.1.....	4.6	4.6	1.1	2.3
-25.0 to -15.1.....	2.3	1.1	2.3	9.1
-15.0 to -5.1.....	17.1	5.7	6.8	9.1
-5.0 to 4.9.....	48.9	34.1	65.9	38.6
5.0 to 14.9.....	12.5	12.5	13.7	19.3
15.0 to 24.9.....	2.3	11.4	-----	6.8
25.0 to 34.9.....	1.1	4.6	1.1	4.6
35.0 and over.....	6.7	12.4	5.7	4.6
Total.....	100.0	100.0	100.0	100.0
Gain ²	45.5	46.6	43.2	48.9
Loss ²	48.9	43.2	50.0	29.5
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Average change.....	12.3	29.0	8.3	16.5
Gain.....	13.6	32.4	10.8	17.6
Loss.....	12.4	32.1	7.3	26.6
Maximum:				
Gain.....	93.6	160.9	64.2	79.6
Loss.....	84.6	172.7	48.4	106.1

¹ Based on prices of worsted machine knitting yarn, 2/20s-50s/56s, undyed, in oil, on skein, f. o. b. mill; worsted weaving yarn, 2/32s-64s, undyed, f. o. b. mill; men's and boys' woolen flannel suiting, stock dyed, 12-13 oz. yd., fine and medium grade 57"/60", f. o. b. mill; and men's and boys' worsted suiting, 12-13 oz., f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn or fabric obtainable from a pound of wool.

² Gain and loss on long market interests in yarns and fabrics not hedged.

Wool fabric.—Data relating to prices of selected wool fabrics on the 15th of the month, as reported by the Bureau of Labor Statistics, show considerable changes over relatively short periods (figure 1, p. 9). Prices of worsted suiting for men and boys, for example, advanced from about \$3.44 a yard in May 1950 to about \$5.18 in January 1951, an advance of \$1.74 within about 8 months. These prices declined from \$5.14 a yard in July 1951 to \$3.82 in October, a decline of \$1.32 within about 3 months. Smaller changes at other times are indicated by the data presented in figure 1.

Similar data for woolen suiting for men and boys show that prices advanced from \$2.96 a yard in May 1950 to about \$4.46 in February 1951, an advance of \$1.50 within about 9 months. Fluctuations in prices of wool fabrics, as well as wool yarns, were greater in 1950 and 1951, than in other recent years.

During the 8 years 1947 to 1954, inclusive, changes over 4-month periods in value of the quantity of worsted suiting for men and boys obtainable from a pound of wool ranged up to \$1.06 and averaged about 16 cents (table 6). These changes amounted to 25 cents or more 17 percent of the time, 35 cents or more 10 percent of the time, and 45 cents or more 9 percent of the time. Similar data for woolen suiting for men and boys show that during the 8 years, changes over 4-month periods in value of the quantity of this fabric obtainable from a pound of wool ranged up to 64 cents and averaged about 8 cents (table 6). These changes amounted to 25 cents or more 11 percent of the time and to 35 cents or more 9 percent of the time.

Extent of changes over 4-month periods in prices of wool fabrics also varied considerably from year to year and from one part of the season to another. During the 8 years ended with 1954, average changes over 4-month periods in value of the quantity of worsted suiting for men and boys obtainable from a pound of wool ranged from about 5 cents in 1953 and 1954 to about 57 cents in 1951. These changes varied considerably from one part of the year to another but no seasonal pattern was indicated. Average changes increased from about 8 cents for 2-month periods to about 23 cents for 6-month periods.

Gains and Losses From Change in Spot Prices

Changes in spot prices of raw wool, wool tops, and wool yarns and fabrics include both advances and declines. Consequently, they represent both gains and losses on long- and short-marketing interests in these commodities. Results of analyses of changes in spot prices as shown in tables 1 to 6, inclusive, are presented primarily from the viewpoint of those who have long market interest in the spot commodities. It is recognized, of course, that the gains and losses shown on long-market interests represent losses and gains, respectively, on short-market interest in the spot commodity.

Raw wool.—Changes over 16-week periods in prices of territory fine combing wool in Boston, during the 8-year period ended with 1954, show declines about one-third of the time, but the declines averaged about 32 percent greater than the advances (table 1, p. 10). Advances and declines in prices of this wool are fairly typical of those for other qualities of wool (table 3, p. 12). With declines

in prices over 16-week periods averaging about 23 cents a pound and stocks of apparel wool in the United States averaging about 2,000,000 pounds during this 8-year period, the average aggregate loss on long-market interests in this wool from these declines in prices approximated \$46,000,000. The average aggregate gain on long-market interests in this wool from advances in prices over 16-week periods approximated \$40,000,000, but the number of these advances was greater than the number of declines. The proportion of the time that prices of wool advanced and declined, the extent of these advances and declines over specified periods, and the quantity of wool held by dealers and manufacturers varied considerably from year to year and from one part of the season to another. Consequently, the extent of aggregate gains and losses on market-interests in wool from price changes over specified periods varied widely.

Wool tops.—Changes over 16-week periods in prices of wool tops (64s oil combed) in Boston, during the 8 years 1947-54, inclusive, show declines about one-third of the time, but the declines averaged almost 32 percent greater than the advances (table 4, p. 14). With declines in these prices over 16-week periods averaging about 29 cents a pound and stocks of wool tops held by dealers, topmakers, and manufacturers in the United States averaging about 29,000,000 pounds during this 8-year period, the average aggregate loss on long-market interest in wool tops from these declines in prices approximated \$8,400,000. The average aggregate gain on long-market interest on wool tops from advances in prices over 16-week periods approximated \$6,400,000, but the number of these advances was considerably greater than the number of the declines. The proportion of the time that prices of wool tops advanced and declined, the extent of these advances and declines over a specified period, and the quantity of wool tops held by dealers, topmakers, and manufacturers varied considerably from year to year and from one part of the season to another. Consequently, the extent of the aggregate gains and losses on market interests on wool tops from changes in prices over specified periods varied widely.

Wool yarn.—Changes over 4-month periods in prices of the quantity of worsted weaving yarn (2/32s-6-1s, undyed) obtainable from a pound of wool, during the 8 years ended 1954, show declines about 43 percent of the time and advances about 47 percent of the time (table 6, p. 16). The declines ranged up to \$1.72 and averaged 32 cents, and the advances ranged up to \$1.60 and averaged about 32 cents. Similar data for worsted knitting yarn (2/20s-50s/56s, undyed) show declines about 49 percent of the time and advances about 46 percent (table 6, p. 16). The declines ranged up to 84 cents and averaged 12 cents and the advances ranged up to 93 cents and averaged almost 14 cents. With total stocks of wool yarn in recent years averaging more than a million pounds (23), it is apparent that aggregate gains and losses on market interests in these products from changes in prices over 4-month periods are at times quite large. These gains and losses vary widely from year to year and from one part of the year to another.

Wool fabric.—Changes over 4-month periods in prices of the quantity of worsted suiting for men and boys (12-13.5 oz., 50"/60") obtainable from a pound of wool, during the 8 years ended 1954, show declines about 30 percent of the time and advances about 49 percent (table 6,

p. 16). The declines ranged up to \$1.06 and averaged about 27 cents and the advances ranged up to about 80 cents and averaged 18 cents. Similar data for woolen flannel suiting for men and boys (12-13 oz., 57"/16") show declines 50 percent of the time and advances 43 percent (table 6, p. 16). The declines ranged up to 48 cents and averaged about 7 cents and the advances ranged up to 64 cents and averaged 11 cents. With total stocks of finished and unfinished cloth averaging more than 25 million linear yards in recent years (24), it is apparent that gains and losses on market interest in these products from changes in prices over 4-month periods were at times quite large. The gains and losses vary widely from year to year and from one part of the season to another.

RELATION OF SPOT PRICES TO PRICES OF FUTURES CONTRACTS

The effectiveness of futures trading in reducing or offsetting risks from changes in prices depends mainly upon the relationships between spot prices and prices of futures contracts (12, 19). The relationships between spot prices of wool and wool products and prices of wool and wool top futures contracts determine: (1) The extent to which losses from changes in spot prices of these products can be offset by the use of futures contracts as hedges, (2) the adjustments in spot prices of these products from market to market and from one period to another that may be brought about by futures trading, and (3) the dependability of futures price quotations as a guide in buying and selling these products. Information showing the extent to which changes in spot prices of raw wool, wool tops, and wool yarns and fabrics are associated with similar changes in prices of wool and wool top futures contracts supplies a basis for understanding the protection from fluctuations in spot prices that is afforded by trading in wool and wool top futures.

Spot-Futures Price Relationships

Large swings in spot prices of wool and wool tops usually are associated with more or less similar changes in prices of futures contracts, particularly for the near-active months (the nearest months in which futures trading is active). During the 8 years 1947-54, inclusive, changes over 16-week periods in spot prices of territory fine staple combing wool in Boston, when related to the corresponding changes in prices of wool futures in New York for the near-active month, gave a correlation coefficient of 0.85. In other words, about 72 percent of the changes in spot prices of this wool were associated with similar changes in prices of futures contracts. The regression equation, $y=5+0.80x$, indicates that, on the average, for each change of 1 cent in spot prices of territory fine staple combing wool in Boston, prices of New York wool futures contracts for the near-active month changed about 0.80 cent in the same direction. The standard error of the regression coefficient was found to be 0.05.

During a substantial proportion of the 8-year period covered by this study, farm prices of wool averaged near the Government price

support level and changes in prices were relatively small. In 1950, 1951, and the first part of 1952, farm prices of wool averaged substantially above the Government price support level and changes in prices of wool were relatively large. Changes over 16-week periods, ended during 1950, 1951, and the first part of 1952, in spot prices of territory fine staple combing wool in Boston, when related to corresponding changes in prices of wool futures in New York for the near-active month, gave a correlation coefficient of 0.94 (fig. 2). In other words, about 88 percent of the changes in spot prices of this wool were associated with similar changes in prices of futures contracts. The regression equation, $y=10+0.93x$, indicates that, on the average, for each change of 1 cent in spot prices of territory fine combing wool

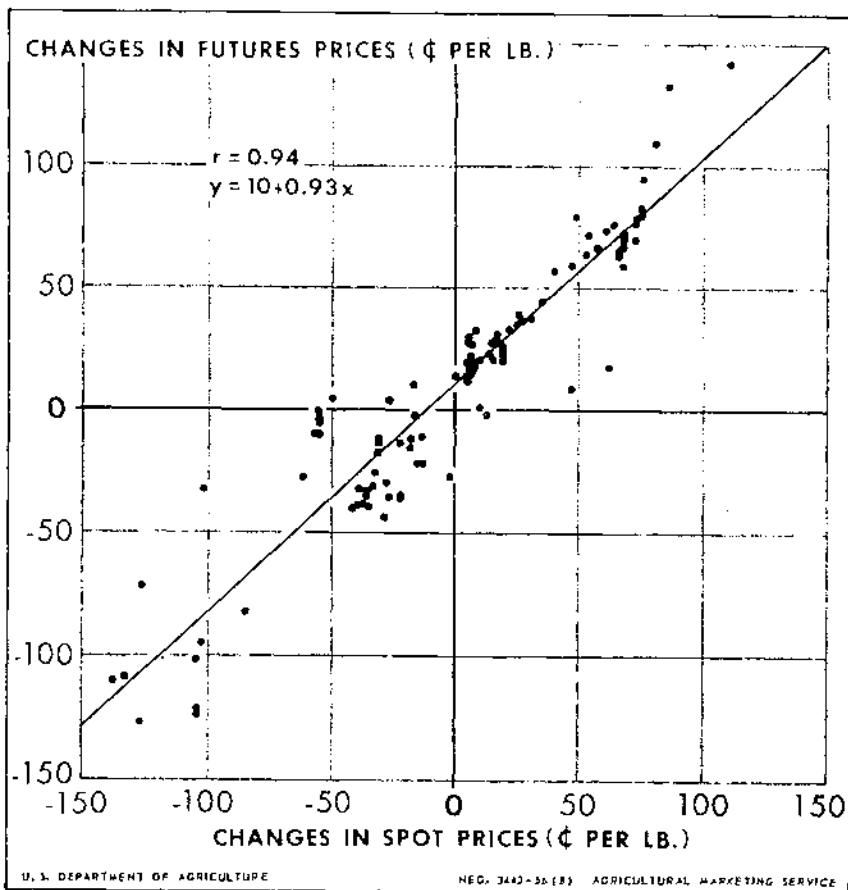


FIGURE 2.—Changes over 16-week periods in spot prices of territory fine staple combing wool in Boston and in prices of New York wool futures contracts for the near-active month, 1950, 1951, and early 1952. During this period, changes over 16-week periods in spot prices of territory fine staple combing wool in Boston usually were fairly closely associated with similar changes in prices of New York wool futures contracts for the near-active month. The correlation coefficient was found to be 0.94 and the regression equation is $y=10+0.93x$. The standard error of the regression coefficient was found to be 0.03.

in Boston, prices of New York wool futures contracts for the near-active month changed about 0.93 cent in the same direction. The standard error of the regression coefficient was found to be 0.03.

Similar analysis for wool tops shows that changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston, during the 8-year period ended with 1954, when related to the corresponding changes in prices of New York wool top futures contracts for the near-active month, gave a correlation coefficient of about 0.86. This means that nearly three-fourths of the changes in spot prices of wool tops were associated with similar changes in prices of wool top futures contracts for the near-active month. The regression equation, $y=5+0.80x$, indicates that, on the average, for each change of 1 cent in spot prices of wool tops (64s oil combed) in Boston, prices of New York wool top futures for the near-active month changed 0.80 cent in the same direction. The standard error of regression was found to be 0.05.

Changes in prices of wool tops, as well as those for wool, were relatively small when farm prices of wool averaged near the Government price support level. They were relatively large in 1950, 1951, and the first part of 1952, when farm prices of wool were substantially above the price support level. Changes over 16-week periods ended during 1950, 1951, and the first part of 1952 in spot prices of wool tops (64s oil combed) in Boston, when related to the corresponding changes in prices of New York wool top futures for the near-active month, gave a correlation coefficient of 0.96 (fig. 3). This means that about 92 percent of the changes in spot prices of wool tops were associated with similar changes in prices of wool top futures for the near-active month. The regression equation, $y=6+0.96x$, indicates that, on the average, for each change of 1 cent in spot prices of wool tops (64s oil combed) in Boston, prices of New York wool top futures for the near-active month changed 0.96 cent in the same direction. The standard error of the regression was found to be 0.03.

Spot prices of wool and wool tops and prices of wool and wool top futures contracts are largely determined by the same group of supply and demand factors. In addition, futures contracts can be converted into the spot commodity at the date of their maturity if either the seller or the buyer so desires. Spot prices of wool or wool tops at delivery points for futures contracts that are unusually low in relation to prices of maturing futures contracts may encourage sellers of futures to deliver wool or wool tops on futures contracts instead of offsetting their short position in the futures market by buying futures contracts at relatively high prices. On the other hand, spot prices of wool or wool tops at delivery points that are unusually high in relation to prices of maturing futures contracts may encourage buyers to require the delivery of wool or wool tops in settlement of futures contracts instead of offsetting their long position in the futures market by selling futures contracts at relatively low prices. The effect in either case would be to bring spot prices of the standard quality of wool or wool tops at delivery points and prices of near-month futures contracts fairly close together as the date of maturity of the futures contracts approaches. This tie-up helps to account for the association of the larger and principal changes in spot prices of wool and wool tops with more or less similar changes in prices of futures contracts (3).

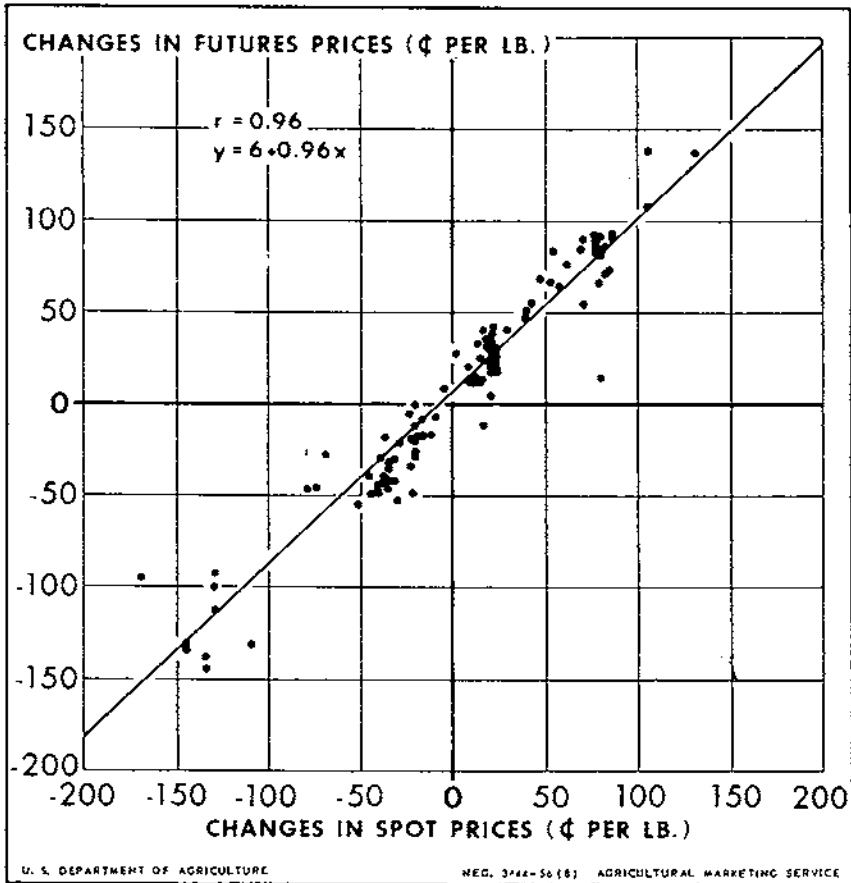


FIGURE 3.—Changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston and in prices of New York wool top futures contracts for the near-active month, 1950, 1951, and early 1952. During this period, changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston usually were fairly closely associated with similar changes in prices of New York wool top futures contracts for the near-active months. The correlation coefficient was found to be 0.96 and the regression equation is $y = 6 + 0.96x$. The standard error of the regression coefficient was found to be 0.03.

Spot prices of wool and wool tops and prices of futures contracts for these commodities do not always change by the same amounts or in the same directions. Consequently, the spread between spot prices of wool and wool tops at delivery points and prices of futures contracts, particularly for the more distant months, may vary widely. Prices of futures contracts, particularly for the more distant months, at times may be a great deal lower than, and at other times they may be substantially above, spot prices of the standard quality of wool or wool tops at delivery points. During the 8-year period ended with 1954, prices of New York wool futures contracts ranged from 73 cents a pound below spot prices of territory fine staple combing wool in Boston in August 1951, to 7.5 cents a pound above these spot prices in May 1948. Similar data for wool tops show that prices of New York

wool top futures ranged from about \$1.00 a pound below spot prices of wool tops (64s oil combed) in Boston in April 1949 to about 5 cents a pound below these spot prices in August 1951. Spreads between spot prices at delivery points and prices of futures contracts for the more distant months, and changes in these spreads, usually are greater than those calculated from prices of futures contracts for near-active months. But changes over 16-week periods in spread between spot prices and prices of futures contracts for the near-active month, during this 8-year period, amounted to 25 cents or more a pound 12 percent of the time for wool and 15 percent of the time for wool tops.

Prices of wool and wool tops futures contracts are not so closely related to prices of wool yarns and fabrics as to spot prices of wool and wool tops. During the 8-year period ended with 1954, changes over 4-month periods in value of the quantity of worsted weaving yarn obtainable from a pound of wool when related to the corresponding changes in prices of New York wool top futures for the near-active month gave a correlation coefficient of 0.73. This means that only about one-half of the changes in value of this yarn was associated with similar changes in prices of wool top futures contracts. The regression equation, $y=5+0.56x$, indicates that, on the average, for each change of 1 cent in value of the quantity of this yarn obtainable from a pound of wool, prices of wool top futures for the near-active month changed 0.56 cent in the same direction. The standard error of the regression coefficient was found to be 0.06.

Similar data for worsted suiting for men and boys show that changes over 4-month periods in the value of the quantity of this fabric obtainable from a pound of wool, when related to the corresponding changes in prices of wool top futures for the near-active month, gave a correlation coefficient of 0.70. This means that less than one-half of the changes in value of this fabric were associated with similar changes in prices of wool top futures contracts. The regression equation, $y=5+0.94x$, indicates that, on the average, for each change of 1 cent in value of the quantity of this fabric obtainable from a pound of wool, prices of wool top futures for the near-active month changed 0.94 cent in the same direction. The standard error of the regression coefficient was found to be 0.11.

Changes in prices of wool yarns and fabrics as well as those in spot prices of wool and wool tops averaged greater when farm prices of wool averaged substantially above, than when they averaged about the same as, the Government price support level. Relationships between changes over 4-month periods in prices of wool yarns and fabrics and the corresponding changes in prices of wool top futures contracts were somewhat higher when farm prices of wool averaged substantially above, than when they averaged about the same as, the Government price support level.

Factors Affecting Spot-Futures Price Relationships

Spreads between spot prices of raw wool, wool tops, and wool yarns and fabrics and prices of wool and wool tops futures contracts, and changes in these spreads, are accounted for mainly by (1) differences in nature, quality, and evaluation of the products; (2) differences in date of delivery and between the immediate and prospec-

tive demand and supply situation; (3) differences in place of delivery and in terms and conditions of sale. Information relating to these factors are presented in the order listed.

Differences in nature, quality, and evaluation of the products.—Differences between prices of futures contracts and spot prices of wool, wool tops, and wool yarns and fabrics vary widely with the nature and quality of the products to which the spot prices apply. Prices of wool futures contracts apply to the standard grade which is 64s shorn from sheep of the United States. The staple is 2½ inches long and the lot must be of good color. Spot prices may apply to any one or more of the various qualities of wool. On June 11, 1954, for example, quoted prices (clean basis) of territory wool in Boston ranged from 95 cents a pound for common and braid to \$1.80 for good French combing and staple. Closing prices of wool futures contracts in New York on that date ranged from \$1.60 for July to \$1.73 for October contracts. It is apparent from these data that spot prices of the higher qualities may be considerably higher than prices of futures contracts, whereas, at the same time and in the same market, spot prices of the lower qualities may be a great deal lower than prices of futures contracts.

Prices of wool top futures apply to 64s oil combed tops, whereas spot prices may apply to any one or more of the various qualities of wool tops. On June 11, 1954, for example, spot prices of oil combed wool tops in Boston ranged from \$1.50 a pound for 50/56s to \$2.25 for 64s. Closing prices of wool top futures in New York on that date ranged from about \$2.02 for May to \$2.07 for October contracts. These data clearly indicate that spot prices of wool tops of the higher grades may be considerably higher than prices of wool top futures contracts; whereas, at the same time and in the same market, spot prices of wool tops of the lower grades may be a great deal lower than prices of futures contracts.

Wool yarns and fabrics differ from raw wool and wool tops as a result of the value added by manufacture. In 1947, less than 60 percent of the value of the products of wool yarn mills, and less than 50 percent of the value of the products of woolen and worsted fabric manufacturers, were accounted for by costs of the raw material used (18). The value added by manufacture of wool yarns and fabrics accounts for substantially higher prices for these products than the prices of the wool used in their manufacture. Changes in the relative demand-and-supply situation for raw wool and for wool products, and in wages and other items of cost of manufacturing these products, may result in wide variations in spread between prices of wool and wool top futures contracts and prices of wool yarns and fabrics.

Wool and wool tops of various grades and staple lengths may be delivered in settlement of the futures contract obligation at the seller's option. Prices allowed for wool or wool tops, other than the quality designated as the "exchange standard," delivered on futures contracts are arrived at by adding specified proportions to, or subtracting specified proportions from, the price specified in the futures contracts for the standard quality (32). The buyer of futures contracts cannot tell in advance of the notice received how many or what qualities of wool or wool tops will be delivered. But he may reasonably expect that the wool or wool tops tendered will be of the deliver-

able grades and staple lengths least desirable at prices allowed on the contract, and of the lowest qualities of each such grade and staple length that the seller has available to offer (27).

Sometimes price differences for certificated wool or wool tops, based on fixed differences established by the Exchange, do not reflect accurately the differences in spot values of the various qualities available for delivery on futures contracts. It is then advantageous for the seller to confine his deliveries to the quality or qualities for which the price allowed on futures contracts, in relation to prices of the spot commodity, are relatively highest. In such situations, prices of futures contracts may be depressed by an amount equivalent to the difference between the evaluations in the spot market and evaluations for delivery on futures contracts of the qualities of wool or wool tops most likely to be delivered. Consequently, spot prices of wool and wool tops of the standard quality usually are higher than prices of wool and wool top futures contracts, respectively.

Differences in date of delivery and between the immediate and prospective demand-and-supply situation.—The influence that differences in quality and evaluation of wool and wool tops has on the spot-futures price relationship, as indicated in the preceding section, may be supplemented or offset, at least in part, by the influence of differences in date of delivery and between the immediate and prospective demand and supply situations.

If supplies of wool or of wool tops made available in the market are abnormally large in relation to the demand for these products, when relatively smaller supplies are anticipated, spot prices may be depressed in relation to prices of futures contracts, particularly those for the more distant months (16, 27). Such situations may exist during or soon after the shearing season when the clip is abnormally large, if price support or other control programs are not in effect. But the extent to which spot prices of wool at delivery points, deliverable on futures contracts, can be depressed below prices of futures contracts under such conditions, normally is expected to be limited to an amount about equal to the costs of carrying the spot commodity to the date of maturity of the futures contracts plus the costs of delivering it on futures contracts.

If spot prices of wool or of wool tops at delivery points, deliverable on futures contracts, were depressed below prices of futures contracts by amounts appreciably greater than the costs of carrying and delivering the wool or wool tops, traders could make an assured profit by selling futures for the purpose of making delivery. But spot prices of these products would need to be depressed below prices of futures contracts by amounts greater than the costs of buying the spot commodity, of carrying it to date of delivery, and of delivering it on futures contracts, before assured profits could be obtained by buying the spot commodity and selling futures contracts for the purpose of making delivery.

A relative shortage of wool or of wool tops immediately available in the market, along with the anticipation of relatively larger supplies, tends to raise spot prices in relation to prices of futures contracts, particularly for the more distant months (27, 20). The effects of such situations may be particularly noticeable during seasons of small clips and relatively small available supplies, especially if dealers, handlers,

and topmakers have sold large quantities of wool forward. Under such conditions the difficulty of obtaining wool with which to fulfill their commitments stimulates keen competition by merchants for the available supplies. Also, a shortage of the most desired qualities of wool stimulates early purchasing of the spot commodities by topmakers and manufacturers, and the advance in prices, with short supplies, stimulates delayed marketing by producers. All this may advance prices of the spot commodity more rapidly than prices of futures contracts, particularly for the more distant months.

Price support programs and other forms of organized control may result in a relative shortage of supplies of wool immediately available in the market. Spot prices of wool then may be high in relation to prices of futures contracts, particularly for the more distant months. This may be true even when the total physical quantity of wool in existence is relatively large. In 1953, for example, a large proportion of the domestic clip was pledged as collateral for Commodity Credit Corporation loans and spot prices of territory fine staple combing wool in Boston averaged substantially above prices of wool futures in New York.

The extent to which prices of futures contracts may go below spot prices of the standard quality of wool or of wool tops at delivery points cannot be so definitely indicated as that for the reverse relationship. Prices of futures contracts may go below spot prices of these commodities, plus carrying charges at delivery points, by amounts greater than the costs of receiving the products on futures contracts. This may happen before the purchaser can obtain the spot commodity at the date of maturity of the futures contracts, and at lower costs, by purchasing futures contracts and requiring delivery than by purchasing the spot commodity at the same time. Acute shortages of the spot commodity immediately available in the market at current prices, along with the prospects of relatively larger supplies, may raise spot prices in relation to prices of futures contracts, particularly for the more distant months. Such an increase may be substantially greater than the costs of receiving the spot commodity on futures contracts. In addition, uncertainty with regard to the time of delivery and the qualities and commercial value of wool or of wool tops which may have to be accepted on futures contracts, as indicated more in detail in the preceding section, may also depress prices of futures contracts in relation to prices of the spot commodity.

A relative shortage of available supplies of wool or of wool tops at prevailing prices, together with rather large long market interests in near-months futures contracts, under some circumstances may be favorable to a "squeeze" of the near-months futures contracts. The term "squeeze" is used to describe a situation in which more of the spot commodity is expected to be called for in settlement of maturing futures contracts than is readily available for this purpose. As a result of a "squeeze," prices of futures contracts maturing or about to mature may be raised substantially above prices of contracts maturing in more distant months. They also may advance considerably in relation to spot prices of the commodity not readily available for delivery on futures contracts.

The option on the part of the seller of a futures contract to deliver wool or wool tops on any date during the month of its maturity makes him less vulnerable to being squeezed and permits him to make delivery at the time during the month when it is most convenient or most advantageous for him. These advantages increase the desirability of the contract from the sellers' viewpoint. On the other hand, such options add an element of uncertainty to be considered by one who anticipates receiving wool or wool tops on futures contracts. He must hold himself in readiness to receive the commodity at any time during the month. This uncertainty reduces the desirability of futures contracts from the purchasers' viewpoint. These advantages to sellers and disadvantages to buyers may weaken the prices of futures contracts in relation to prices of the spot commodity, particularly as the date of the maturity of the contracts approaches (27, 20).

Differences in place of delivery and in terms and conditions of sale.—Spot-futures price relationships for wool or wool tops may be affected also by differences in place of delivery and in terms and conditions of sale. Spot prices of wool or of wool tops of the same quality in different market places vary considerably, and these variations are reflected in the spreads between prices of the spot commodity and of futures contracts. Prices of wool in surplus-producing areas that are long distances from consuming centers usually are lower than prices of wool of the same quality near centers of consumption. Data relating to prices (clean basis) at Boston and to growers for wool of the 1946 clip purchased by the Commodity Credit Corporation show that average prices to growers ranged from about 22 cents a pound in some States to more than 28 cents in others below Boston prices for the wool (18). Consequently, differences in spread between prices of wool at the different locations and prices of a specified futures contract vary accordingly.

Differences in terms and conditions of sale also may affect the amounts and variations in the spread between spot prices of wool and wool tops and prices of futures contracts (27, 19). Prices of futures contracts for wool and wool tops relate to the Exchange standard quality, but wool and wool tops of other deliverable qualities may be delivered in settlement of futures contract obligations at specified premiums or discounts from the prices specified for the standard quality. Those who receive wool or wool tops on futures contracts must accept whatever combinations of these qualities are offered, regardless of the number or the relative desirability of the qualities included. Prospective receivers may reasonably expect that the wool or wool tops tendered on futures contracts will be of the least desirable qualities at the contract price that the deliverer has available and eligible to deliver. On the other hand, transactions in the spot market may be for large lots of wool or wool tops of the quality or qualities most desired and for delivery at the desired time and place. Spot prices of wool or wool tops of the Exchange standard or better sold under these conditions naturally would tend to be higher than prices of futures contracts for delivery in the same market during the same month.

Wool or wool tops obtained in spot markets under such terms and conditions normally would be preferred to wool and wool tops of

comparable average grade and staple length obtainable on futures contracts, even if there were no differences in quality of wool or wool tops within specified grade and staple length designations. But the qualities of wool or wool tops included within a specified grade and staple length designation, even when the commodities are accurately classed in accordance with the established standards, may vary considerably. Furthermore, the range in quality included within specified grade and staple length designations may be increased by normal variations in evaluations among competent classes. Such differences in quality may be reflected in prices of the spot commodity, but for wool or wool tops delivered on futures contracts the lower qualities may be worth about as much as the higher qualities included among wool or wool tops of the same deliverable grade and staple length designations.

RISKS FROM CHANGES IN BASIS

An alternative to taking the gains and suffering the losses from changes in spot prices of wool, wool tops, and wool yarns and fabrics, as previously indicated (p. 7), is to hedge long- and short-market interests in these commodities by offsetting sales and purchases of futures contracts. Such hedges may be used to limit gains and losses from changes in prices to those resulting from changes in the spread between spot prices and prices of futures contracts, usually referred to as changes in basis. This means of hedging is based on the assumption that changes in prices of the spot commodity will be associated with more or less similar changes in prices of futures contracts.

When the movement of spot prices and prices of futures contracts are parallel (which is by no means the usual relationship), those who hedge long-market interests in wool, wool tops, or wool yarns and fabrics by offsetting sales of futures contracts lose on the spot commodity as prices decline, but the losses from declines in spot prices may be offset by gains from changes in prices of futures contracts. On the other hand, as prices advance, the gains on the spot commodity may be offset by losses on futures contracts. Gains and losses on long-market interests in the spot commodity would have as their counterpart losses and gains, respectively, on short-market interests in the commodity. The hedge under such conditions could be used to offset both losses and gains from changes in prices.

Although, as indicated earlier (p. 19), the large swings in spot prices of wool, wool tops, and wool yarns and fabrics usually are associated with more or less similar changes in prices of futures contracts, substantial changes in the spread between spot prices of these products and prices of futures contracts occur in many instances during relatively short periods. Risks of loss and the possibilities of gain from such changes in spread are not offset by the normal hedging procedure. They may be responsible for substantial gains and losses to handlers, dealers, topmakers, manufacturers, and others who may hedge invariably, but who fail to anticipate correctly the changes in basis. The extent of such gains and losses may be indicated by data which show changes in spread between spot prices of these commodities and prices of futures contracts.

Extent of Changes in Basis

As indicated in an earlier section of this bulletin (p. 19), prices of futures contracts usually are much more closely related to spot prices of wool and wool tops than to spot prices of wool yarns and fabrics. Consequently, changes in the spread between prices of futures contracts and spot prices of wool and wool tops usually are much less than those between prices of wool top futures contracts and spot prices of wool yarns and fabrics. Data relating to changes in spread between prices of futures contracts and spot prices of wool, wool tops, and wool yarns and fabrics are presented in the order listed.

Raw wool.—Data relating to the spread between spot prices of territory fine staple combing wool in Boston and prices of near-month wool futures contracts in New York show that, during the 8 years ended with 1954, changes over 16-week periods in spread between these prices amounted to as much as 69 cents a pound, and averaged 12.6 cents (table 7). These changes amounted to 25 cents or more 12 percent of the time, 15 cents or more almost 29 percent of the time, and 5 cents or more about 75 percent of the time. The extent of these changes in spreads varied considerably from year to year (table 7) and from one part of the season to another (table 8). They were greatest for 16-week periods ended July to November. Changes in basis for territory fine staple combing wool are fairly typical of those for other qualities of wool (table 9).

Changes in basis vary considerably with the length of the interval and with the futures contract used in calculating the changes. During the 8 years ended with 1954, changes in basis for territory fine staple combing wool in Boston, when calculated from prices of near-month wool futures contracts in New York, averaged 8.8 cents a pound for 8-week, 12.6 cents for 16-week, and 15.9 cents for 24-week periods. Changes in basis for this wool, when calculated from prices of wool futures, averaged somewhat less than when calculated from prices of wool top futures. These changes in basis, when calculated from prices of futures for more distant months, averaged about the same as when calculated from prices of futures for near-active months.

Wool tops.—Similar data relating to the spread between spot prices of wool tops (64s oil combed) in Boston and prices of near-month wool top futures contracts in New York show that, during the 8 years ended with 1954, changes over 16-week periods in spread between these prices amounted to as much as 74.5 cents a pound, and averaged 13.8 cents (table 10). These changes amounted to 25 cents or more 15.4 percent of the time, 15 cents or more about a third of the time, and 5 cents or more almost three-fourths of the time. The extent of these changes in basis varied widely from year to year (table 10) and considerably from one part of the season to another (table 11). They were greatest for 16-week periods ended July to November.

Changes in basis for wool tops vary considerably with the length of the interval and with the futures contract used in calculating the changes. During the 8 years ended with 1954, changes in basis for wool tops (64s oil combed) in Boston, when calculated from prices of near-month wool top futures contract in New York, average 10 cents a pound for 8-week, 13.8 cents for 16-week, and 15.8 cents for 24-week

TABLE 7.—Changes over 16-week periods in spreads between spot prices of territory fine staple combing wool in Boston and prices of near-month wool futures in New York, 1947-54¹

Item	1947	1948	1949	1950	1951	1952	1953	1954	Total
Change in cents per pound:									
Under -35.0	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
—35.0 to -25.1	5.4		5.8		28.2				3.1
—25.0 to -15.1	35.2	1.9	11.5	1.9	18.8				3.9
—15.0 to -5.1	27.0	30.2	25.0	9.6	9.4	7.7	1.9	7.5	11.5
—5.0 to 4.9	21.6	22.6	21.2	59.6	9.4	30.8	30.8	52.8	34.2
5.0 to 14.9	10.8	9.4	2.0	27.0	12.5	32.7	55.8	17.0	24.6
15.0 to 24.9		17.0	11.5		6.2	26.9	11.5	18.9	12.5
25.0 to 34.9		9.4	11.5		6.2	1.9		3.8	5.2
35.0 and over		9.5			3.1				3.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	18.9	49.1	51.5	9.6	21.9	48.1	34.6	28.3	31.9
Loss ²	78.4	50.9	63.5	90.4	78.1	50.0	63.5	71.7	67.4
Average change	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Gain	12.2	14.8	19.2	10.0	28.4	7.8	5.2	9.6	12.6
Loss	5.0	23.0	17.9	3.0	23.2	6.5	3.8	9.2	12.5
Maximum:	14.4	6.9	19.9	10.7	29.9	9.4	6.1	9.7	12.9
Gain	7.5	57.3	28.0	8.5	44.8	15.0	8.5	18.8	57.3
Loss	26.0	16.6	43.5	30.6	69.4	24.5	18.5	20.4	69.4

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool hedged by the sale of futures contracts.

TABLE 8.—Changes over 16-week periods in spread between spot prices of territory fine staple combing wool in Boston and prices of near-month wool futures in New York, by specified periods, 1947-54¹

Item	Changes for periods ended—					
	July-Sept.	Oct.-Nov.	Dec.-Feb.	Mar.-Apr.	May-June	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -35.0.....	4.0	9.9	1.1	-----	-----	3.1
-35.0 to -25.1.....	6.9	4.3	5.4	-----	-----	3.9
-25.0 to -15.1.....	16.8	17.2	9.8	-----	9.5	11.5
-15.0 to -5.1.....	26.7	21.4	17.8	45.6	30.2	34.2
-5.0 to 4.9.....	19.8	20.0	26.1	28.1	31.8	24.6
5.0 to 14.9.....	10.9	22.9	9.8	8.8	11.1	12.5
15.0 to 24.9.....	5.9	4.3	-----	8.8	9.5	5.2
25.0 to 34.9.....	4.0	-----	-----	5.2	7.9	3.2
35.0 and over.....	5.0	-----	-----	3.5	-----	1.8
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	34.7	37.1	18.5	33.3	39.7	31.9
Loss ²	65.3	62.9	79.3	66.7	58.7	67.4
Average change.....	<i>Cents</i> 15.7	<i>Cents</i> 15.6	<i>Cents</i> 10.0	<i>Cents</i> 10.4	<i>Cents</i> 10.5	<i>Cents</i> 12.6
Gain.....	16.1	8.5	5.6	16.7	12.9	12.5
Loss.....	15.4	19.8	11.3	7.2	9.2	12.9
Maximum:						
Gain.....	57.3	18.8	14.0	44.8	26.5	57.3
Loss.....	55.0	69.4	47.0	14.7	20.4	69.4

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool hedged by the sale of futures contracts.

periods. Changes in basis for wool tops when calculated from prices of wool futures contracts averaged about the same as, or somewhat less than, when calculated from price of wool top futures contracts. These changes in basis when calculated from prices of futures contracts for the more distant months averaged about the same as when calculated from prices of futures for the near-active month.

Wool yarn.—Data relating to changes in spread between spot prices of selected wool yarns on the 15th of the month, as reported by the Bureau of the Census, adjusted to approximate the value of the quantity of yarn obtainable from a pound of wool, and prices of wool top futures in New York show considerable changes over relatively short periods. During the 8 years ended with 1954, these changes over 4-month periods, for worsted knitting yarn, amounted to as much as 72 cents, and averaged 15.8 cents (table 12). Changes in these spreads varied widely from one year to another and were greatest in

TABLE 9.—Changes over 16-week periods in spread between spot prices of specified qualities of wool in Boston and prices of near-month wool futures in New York, 1947-54¹

Item	Territory combing			Bright fleece staple combing	
	Fine staple	½ blood staple	¾ blood	Fine	½ blood
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -35.0.....	3.1	2.4	0.8	3.4	2.3
-35.0 to -25.1.....	3.9	4.4	5.7	5.2	5.0
-25.0 to -15.1.....	11.5	14.6	21.2	13.6	15.6
-15.0 to -5.1.....	34.2	32.4	30.8	29.8	30.3
-5.0 to 4.9.....	24.6	25.6	21.9	23.5	25.1
5.0 to 14.9.....	12.5	11.5	10.4	13.8	13.0
15.0 to 24.9.....	5.2	5.2	6.0	5.2	5.0
25.0 to 34.9.....	3.2	3.4	2.4	3.4	3.1
35.0 and over.....	1.8	.5	.8	2.1	.6
Total.....	100.0	100.0	100.0	100.0	100.0
Gain ²	31.9	28.5	29.0	35.9	31.1
Loss ²	67.4	70.5	70.2	63.4	68.4
Average change.....	<i>Cents</i> 12.6	<i>Cents</i> 12.3	<i>Cents</i> 13.0	<i>Cents</i> 13.4	<i>Cents</i> 12.5
Gain.....	12.5	12.3	11.7	12.8	10.9
Loss.....	12.9	12.5	13.6	14.0	13.3
Maximum:					
Gain.....	57.3	39.8	52.0	57.3	48.8
Loss.....	69.4	64.4	43.0	61.0	54.5

¹ Spot prices of wool in Boston and prices of wool futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gains and losses are calculated for long market interests in wool hedged by sales of futures contracts.

1950 and 1951 when changes in prices were also greatest. They amounted to 25 cents or more about 18 percent of the time, and to 15 cents or more 42 percent of the time. Similar data for worsted weaving yarn show that changes in spot-futures prices spreads over 4-month periods amounted to as much as \$1.39 and averaged 22.5 cents (table 12). They amounted to 25 cents or more 25 percent of the time, and to 15 cents or more 47.6 percent of the time.

Changes in spread between prices of wool yarns and prices of wool top futures contracts vary considerably with the length of the interval and with the futures contract used in calculating the changes. During the 8 years ended with 1954, changes in spread between the value of the quantity of worsted weaving yarn obtainable from a pound of wool and prices of wool top futures for the near-active month averaged about 14.7 cents for 2-month periods, 22.5 cents for 4-month, and 30.7 cents for 6-month periods. These changes in

TABLE 10.—Changes over 16-week periods in spread between spot prices of wool tops (64s oil combed) in Boston and prices of near-month wool top futures in New York, 1947-54¹

Item	1947	1948	1949	1950	1951	1952	1953	1954	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -35.0			25.0	1.9	9.4				4.5
-35.0 to -25.1			21.2	5.8	12.5				4.7
-25.0 to -15.1	24.3	11.3	13.4	17.3	12.5	17.3	1.9	5.7	12.5
-15.0 to -5.1	37.9	11.3	11.5	38.5	21.9	36.5	25.0	37.7	27.4
-5.0 to 4.9	18.9	13.2	9.6	25.0	18.8	23.1	55.8	26.4	24.3
5.0 to 14.9	18.9	22.6	1.9	9.6	15.6	17.3	17.3	13.2	14.4
15.0 to 24.9		15.1	5.8	1.9	6.2	1.9		15.1	6.0
25.0 to 34.9		7.6				3.9		1.9	1.8
35.0 and over		18.9	11.6		3.1				4.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	35.1	75.5	26.9	19.2	31.2	34.6	48.1	34.0	38.6
Loss ²	64.9	24.5	73.1	78.8	68.8	63.5	51.9	64.2	60.6
Average change	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
	10.7	19.6	27.1	11.2	18.2	10.3	4.6	9.5	13.8
Gain	6.5	21.3	24.4	7.0	15.0	9.3	4.2	13.9	13.7
Loss	13.0	14.2	28.1	12.5	19.7	11.1	5.1	7.5	14.1
Maximum:									
Gain	14.0	52.5	51.8	16.8	66.0	27.5	11.5	27.4	66.0
Loss	23.5	24.0	49.0	36.8	74.5	21.7	15.5	19.1	74.5

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool tops hedged by the sale of futures contracts.

TABLE 11.—Changes over 16-week periods in spread between spot prices of wool tops (64s oil combed) in Boston and prices of near-month wool top futures in New York, by specified periods, 1947-54¹

Item	Changes for periods ended—					
	July- Sept.	Oct.- Nov.	Dec.- Feb.	Mar.- Apr.	May- June	Total
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -35.0.....	10.9	5.7	1.1	-----	1.6	4.5
-35.0 to -25.0.....	4.9	7.2	5.4	-----	4.7	4.7
-25.0 to -15.0.....	11.9	17.1	15.2	1.7	14.3	12.5
-15.0 to -5.0.....	24.7	35.7	30.4	15.8	28.6	27.4
-5.0 to 4.9.....	19.8	8.6	28.3	40.4	28.6	24.3
5.0 to 14.9.....	11.9	10.0	13.0	24.6	15.9	14.4
15.0 to 24.9.....	5.0	11.4	3.3	7.0	4.7	6.0
25.0 to 34.9.....	2.0	2.9	2.2	-----	1.6	1.8
35.0 and over.....	8.9	1.4	1.1	10.5	-----	4.4
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	37.6	27.1	29.3	70.2	38.1	38.6
Loss ²	62.4	72.9	67.4	29.8	61.9	60.6
Average change.....	<i>Cents</i> 17.8	<i>Cents</i> 16.2	<i>Cents</i> 11.2	<i>Cents</i> 11.0	<i>Cents</i> 11.3	<i>Cents</i> 13.8
Gain.....	17.4	18.0	10.7	12.8	9.2	13.7
Loss.....	18.0	15.5	12.0	6.6	12.5	14.1
Maximum:						
Gain.....	52.5	41.0	36.5	66.0	26.4	66.0
Loss.....	74.5	42.3	36.8	20.5	36.0	74.5

¹ Prices at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss on long market interests in wool tops hedged by the sale of futures contracts.

spread when calculated from prices of wool top futures contracts for the more distant months averaged about the same to somewhat greater than when calculated from prices of futures contracts for the near-active month.

Wool fabric.—Data relating to changes in the spread between spot prices of selected woolen and worsted fabrics on the 15th of the month, as reported by the Bureau of the Census, adjusted to approximate the value of the quantity of fabric obtainable from a pound of wool, and prices of wool top futures contracts in New York also show considerable changes over relatively short periods. During the 8 years ended with 1954, changes in these spreads over 4-month periods, for worsted suiting for men and boys, ranged up to about 79 cents, and averaged 22.1 cents (table 12). These changes varied widely from one year to another and were greatest in 1950 and 1951 when changes in prices were also greatest. They amounted to 35 cents or more about 17 percent of the time, 25 cents or more 33 percent, and 15 cents or more almost 65 percent of the time. Similar changes in

TABLE 12.—Changes over 4-month periods in spread between spot prices of specified wool yarns and fabrics and prices of wool top futures contracts, 1947-54¹

Item	Worsted yarn		Suiting, men's and boys'	
	Knitting	Weaving	Woolen flannel	Worsted
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -35.0.....	3.4	13.6	9.0	8.0
-35.0 to -25.1.....	9.1	4.6	12.5	12.5
-25.0 to -15.1.....	15.9	11.4	15.9	22.7
-15.0 to -5.1.....	29.5	17.0	17.0	13.6
-5.0 to 4.9.....	20.5	17.0	18.2	12.5
5.0 to 14.9.....	8.0	18.2	8.0	9.1
15.0 to 24.9.....	8.0	11.4	5.7	9.1
25.0 to 34.9.....	2.3	3.4	8.0	3.4
35.0 and over.....	3.3	3.4	5.7	9.1
Total.....	100.0	100.0	100.0	100.0
Gain ²	29.5	47.7	37.5	36.4
Loss ²	69.3	52.3	62.5	63.6
Average change.....	<i>Cents</i> 15.8	<i>Cents</i> 22.5	<i>Cents</i> 21.4	<i>Cents</i> 22.1
Gain.....	16.9	18.7	22.0	23.3
Loss.....	15.5	26.0	21.0	21.5
Maximum:				
Gain.....	72.4	139.0	112.8	79.1
Loss.....	49.0	96.0	67.9	73.4

¹ Based on prices of (1) worsted machine knitting yarn, 2/20s-50s/56s, undyed, in oil, on skein, f. o. b. mill; worsted weaving yarn, 2/32s-64s, undyed, f. o. b. mill; men's and boys' woolen flannel suiting, stock dyed, 12-13 oz. yd., fine and medium grade 57"/60", f. o. b. mill; and men's and boys' worsted suiting, 12-13.5 oz., f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn or fabric obtainable from a pound of wool, and (2) closing prices of near-month wool top futures in New York on the same dates.

² Gain and loss on long market interests in yarns and fabrics hedged by sales of futures contracts.

spot-futures price spreads for woolen suiting for men and boys amounted to 35 cents or more 14.7 percent of the time, 25 cents or more about 35 percent, and 15 cents or more almost 57 percent of the time.

Changes in spread between prices of wool fabrics and prices of wool top futures contracts vary markedly with the length of the period and with the futures contract used in calculating the changes. During the 8 years ended with 1954, changes in spread between the value of the quantity of worsted suiting for men and boys obtainable from a pound of wool and prices of wool top futures contracts for the near-active month averaged 16 cents for 2-month periods, 22.1 cents for 4-month periods, and 25.7 cents for 6-month periods. These

changes in spread when calculated from prices of wool top futures contracts for the more distant months averaged about the same as those calculated from prices of futures contracts for the near-active month.

Gains and Losses From Changes in Basis

Changes in spread between spot prices of raw wool, wool tops, and wool yarns and fabrics and prices of wool and wool top futures contracts represent gains and losses on market interests or positions in these commodities that are hedged by opposite interests or positions in futures contracts. Data relating to gains and losses from changes in these spreads are presented primarily from the viewpoint of long-market interests in the spot commodity, usually referred to as a long-basis position. It is recognized, of course, that changes which represent gains and losses on long-basis positions reflect losses and gains, respectively, on short market interests in the spot commodity hedged, generally referred to as a short-basis position.

When no adjustments are made for carrying charges, as was the case for data contained in this bulletin, the gains and losses per unit shown on long-basis positions are the same as the losses and gains, respectively, on short-basis positions. Adjusting the changes in basis for costs of carrying the spot commodity over specified periods would reduce the gains and increase the losses shown on long-basis positions, and increase the gains and reduce the losses shown on short-basis positions, by amounts equivalent to the carrying charges.

Gains and losses from changes in basis, from the viewpoint of long market interests in the spot commodity, as shown in this section of this bulletin, are limited to results for long interests in raw wool, wool tops, and wool yarns and fabrics hedged by short interests in wool or wool top futures. As indicated above (p. 7), it is realized that such hedging operations may be a part of larger business combinations involving a variety of other types of operations, and that gains and losses from these hedging operations may be supplemented or offset, in whole or in part, by gains and losses from other operations. Alternative gains and losses involved in not hedging market interests in raw wool, wool tops, and wool yarns and fabrics are indicated in another section of this bulletin (see p. 17).

Data relating to gains and losses, on long-basis positions, from changes in spread between spot prices of raw wool, wool tops, and wool yarns and fabrics and prices of wool and wool top futures contracts in New York are presented in the order listed.

Raw wool.—Changes over 16-week periods in spread between spot prices of territory fine staple combing wool in Boston and prices of wool futures contracts for the near-active month show gains on long-basis positions about 32 percent of the time, during the 8 years ended with 1954. The proportions by years ranged from less than 10 percent in 1950 to more than 48 percent in 1948 and 1952 (table 7, p. 30). During this 8-year period, these gains amounted to as much as 57 cents a pound, and they averaged 12.5 cents. Yearly averages ranged from 3 cents a pound in 1950 to 23.2 cents in 1951.

These changes in spread over 16-week periods show losses on long-basis positions about 67 percent of the time, during the 8-year period, and the proportion by years ranged from 50 percent in 1952 to about

90 percent in 1950. The losses amounted to as much as 69 cents a pound, and they averaged 12.9 cents. Yearly averages ranged from about 6 cents a pound in 1953 to about 30 cents in 1951.

Some indications with regard to total gains and losses from changes in basis may be obtained by relating gains and losses per pound to the number of pounds hedged. On October 29, 1954, for example, the volume of short hedges in wool futures totaled about 6,378,000 pounds and the volume of long hedges totaled about 3,912,000 pounds (30). The volume of long and short hedges in wool top futures was greater than that for wool futures. With such volumes of hedges, a substantial proportion of which may reasonably be assumed to be for wool, it is apparent that total gains and losses from changes in basis are at times quite large.

Wool tops.—During the 8 years ended with 1954, changes over 16-week periods in spread between spot prices of wool tops (64s oil combed) in Boston and prices of wool top futures contracts for near months show gains on long-basis positions 38.6 percent of the time, and the proportions by years ranged from about 19 percent in 1950 to 75.5 percent in 1948 (table 10, p. 33). These gains amounted to as much as 66 cents a pound, and they averaged 13.7 cents. Yearly averages ranged from less than 5 cents a pound in 1953 to 24.4 cents in 1949.

Changes in these spreads over 16-week periods show losses on long-basis positions about three-fifths of the time, during the 8-year period, and the proportions by years ranged from about 25 percent in 1948 to almost 79 percent in 1950. The losses amounted to as much as 74.5 cents a pound, and they averaged 14.1 cents. Yearly averages ranged from about 5 cents a pound in 1953 to about 28 cents in 1949.

Data relating to the volume of hedges show that on October 29, 1954, for example, the volume of short hedges in wool top futures totaled more than 10,310,000 pounds and the volume of long hedges totaled about 4,650,000 pounds (30). The volume of long and short hedges in wool futures totaled about half those in wool top futures. With such volumes of hedges, a substantial proportion of which may be assumed to be for wool tops, it is evident that total gains and losses from changes in basis for wool tops are at times large.

Wool yarn.—Changes over 4-month periods in spread between spot values of the quantity of worsted yarns obtainable from a pound of wool and prices of wool top futures contracts, during the 8 years ended with 1954, show gains on long-basis positions about 30 percent of the time for knitting yarn, and almost 48 percent of the time for weaving yarn (table 12, p. 35). The gains amounted to as much as 72 cents, and averaged about 17 cents, for knitting yarn. They amounted to as much as \$1.39, and averaged almost 19 cents, for weaving yarns. The proportion of the time these changes in spread represented gains on long-basis positions and the amounts of the gains varied widely from year to year and from one part of the year to another.

Changes over 4-month periods in these spreads, during the 8-year period, show losses on long-basis positions about 69 percent of the time for knitting yarn, and 52 percent of the time for weaving yarn. The losses amounted to as much as 49 cents, and averaged 15.5 cents, for knitting yarn. They amounted to as much as 96 cents and averaged 26 cents for weaving yarn. The proportion of the time that these

changes in spread reflected losses on long-basis positions and the amounts of losses varied widely from year to year and from one part of the year to another.

Wool fabric.—During the 8 years ended with 1954, changes over 4-month periods in spread between the value of the quantity of men's and boys' wool suiting obtainable from a pound of wool and prices of wool top futures contracts show gains on long-basis positions 37.5 percent of the time for woolen flannel, and 36.4 percent of the time for worsted (table 12, p. 35). The gains amounted to as much as \$1.12, and averaged 22 cents for woolen flannel. They amounted to as much as 79 cents, and averaged 23.3 cents, for worsted. The proportion of the time that these changes in spread represented gains on long-basis positions and the extent of the gains varied widely from year to year and from one part of the year to another.

Changes over 4-month periods in these spreads, during the 8-year period, show losses on long-basis positions 62.5 percent of the time for woolen flannel and 63.6 percent for worsted suiting. The losses amounted to as much as 67 cents and averaged 21 cents for woolen flannel. They amounted to as much as 73 cents and averaged 21.5 cents for worsted. The proportion of the time that these changes in spread reflected losses on long-basis positions and the average amounts of the losses varied widely from year to year and over relatively short periods.

PROTECTION AFFORDED BY FUTURES AS HEDGES

Wool and wool top futures contracts are used extensively by dealers, merchants, topmakers, manufacturers, and others as hedges against losses from changes in spot prices of wool and wool products (30). On October 29, 1954, for example, short hedges in wool futures totaled about 6,378,000 pounds (clean basis) of which about 60 percent was accounted for by dealers and merchants, 39 percent by topmakers, and about 1 percent by manufacturers and others. Long hedges amounted to about 3,912,000 pounds, of which about 73 percent was accounted for by dealers and merchants, 19 percent by topmakers, and 8 percent by manufacturers, wool producers, and others.

Similar data relating to the volume of hedging in wool top futures show that, on October 29, 1954, short hedges totaled 10,310,000 pounds, of which about 29 percent was accounted for by dealers and merchants, 58 percent by topmakers, and 13 percent by manufacturers and others. Long hedges totaled 4,650,000 pounds of which about 62 percent was accounted for by dealers and merchants, 13 percent by topmakers, 18 percent by manufacturers, and 7 percent by others. The volume of hedging in wool top futures has increased markedly in recent years (30).

Such hedges are obtained by offsetting long or short market interests or positions in the spot commodity by sales or purchases, respectively, of futures contracts. Wool growers whose volume of production is adequate may hedge their wool by offsetting sales of futures contracts. This may be done at any time before, during, or after shearing when the price level for futures contracts is considered satisfactory and when no satisfactory offers for spot sales at fixed prices are available. Dealers, merchants, topmakers, manufacturers, and others who have long-market interests in the spot commodity may hedge by offsetting

sales of futures contracts. Those who have sold the spot commodity forward at fixed prices before acquiring the products with which to fulfill their commitments, and others with short market interests in the spot commodity, may hedge by offsetting purchases of futures contracts.

Protection against losses from changes in spot prices of wool and wool products may also be obtained through buying or selling "on call." A call contract is one in which the seller agrees to deliver a specified quantity of products of a specified description and the buyer agrees to receive the products within a designated period, with the price to be derived by adding to or subtracting from the price of a specified futures contract a specified number of cents previously agreed upon by the seller and the buyer. The period within which the price must be fixed is specified in the contract. The time within the period when the price is fixed may be decided by the buyer ("buyer's option") or by the seller ("seller's option") in accordance with the provisions of the contract (4). The information available is not adequate for indicating the extent to which wool growers, dealers, merchants, top-makers, manufacturers, and others buy and sell wool and wool products on call.

Woolgrowers who desire to dispose of their products and at the same time retain the opportunity of profiting from an expected advance in prices, and are willing to retain the risk of loss from a probable decline in prices, may sell their wool on call. Dealers and merchants who buy this wool, since they assume no price risks other than from changes in basis, would not need to sell futures as a hedge until the price for the call transaction is fixed. After the price for a call transaction is fixed, the buyer's long market interests in the spot commodity, if not hedged, would be subject to risks of loss and possibilities of gain from changes in prices.

Manufacturers of wool products may need to secure a supply of raw wool for use in their operations before the products are sold forward at fixed prices. Under such conditions, the manufacturer may buy wool at fixed prices and hedge it by selling futures contracts, or he may secure essentially the same protection from losses as a result of declines in prices by purchasing the wool on call. Dealers or merchants who supply the wool from stocks purchased at fixed prices and hedged would remove their hedge, if they sold the wool at fixed prices, but if they sold it on call, they would not change their hedged position until the manufacturer notified them to fix the price for the call transaction.

Those with long market interests in the spot commodity hedged by the sale of futures contracts, and those who have purchased the spot commodity on call, gain when spot prices advance more, or decline less, than prices of futures contracts. They lose when spot prices advance less, or decline more, than prices of futures contracts. On the other hand, those with short market interests in the spot commodity hedged by the purchase of futures contracts, and those who have sold the spot commodity on call, lose when spot prices advance more, or decline less, than prices of futures contracts. They gain when spot prices advance less, or decline more, than prices of futures contracts.

Those who have long market interests in the spot commodity and also have sold this commodity on call may fix their gross returns from the combined operations by selling as a hedge the futures contracts used as a basis for the on-call transaction (10). The short hedge limits gains and losses from changes in prices to those from changes in basis. Any gains or losses on the short hedged position, from changes in basis under such conditions, would be offset by losses or gains, respectively, on the call sale. This would be true regardless of the changes in prices and in basis, so long as the short hedge and the call transaction were based on the same futures contract. Since any gains or losses on short hedged positions, under these conditions, would be offset by losses or gains, respectively, on call sales, such short hedges would of necessity fix the gross returns from the combined transactions.

The extent to which gains and losses from changes in spot prices of raw wool, wool tops, and wool yarns and fabrics could have been offset by the use of futures contracts as hedges, and the extent of the gains and losses on purchases and sales on call, may be indicated by a comparison of changes in prices of the spot commodity with the corresponding changes in spread between spot prices and prices of futures contracts. Data showing no changes in spread between spot prices and prices of futures contracts indicate that gains and losses from changes in spot prices could have been completely offset by the use of futures contracts as hedges, and that no gains or losses from changes in basis would have been realized from sales and purchases on call.

Changes in spread that are less than the corresponding changes in spot prices mean that gains and losses from changes in spot prices could have been reduced but not completely offset by the use of futures contracts as hedges, and that gains or losses from sales and purchases on call would have been less than the changes in spot prices. Changes in spread as great as or greater than the corresponding changes in spot prices indicate that no reductions in gains or losses from changes in prices could have been made by using futures as hedges, and that gains or losses on sales and purchases on call would have equaled or exceeded the changes in spot prices.

Dealers, merchants, topmakers, manufacturers, and others may supplement or offset, at least in part, the gains and losses from changes in spot prices of wool and wool products, and in spread between these prices and prices of futures contracts, through straddle and other transactions involving trading in futures (4). Furthermore transactions in spot and futures markets for wool and wool products may be parts of larger business combinations involving a variety of other types of operations. The offsetting features of some of these operations may conform to the principle of hedging in the broader sense. But the information available is not adequate for showing the extent to which the assumptions of risks from changes in spot prices of wool and wool products or from changes in basis are parts of larger business combinations including various types of operations. Nor is it adequate to indicate to what extent gains and losses from the assumption of such risks are supplemented or offset by the results of other operations involved in the combined business.

Price Risks Usually Greater Than Basis Risks

Risks of loss and possibilities of gain from changes in spot prices of wool and wool products, and in spread between prices of the spot commodity and prices of futures contracts, vary considerably from one product to another. Data showing the relation of gains and losses from changes in prices of the spot commodity to the corresponding gains and losses from changes in the spread between prices of the spot commodity and prices of futures contracts are presented for raw wool, wool tops, and wool yarns and fabrics in the order listed.

Raw wool.—The extent to which wool growers, dealers, merchants, topmakers, manufacturers, and others who had long or short market interests in raw wool could have reduced or offset their risks of loss and possibilities of gain from changes in spot prices by the use of futures contracts as hedges, and the gains and losses on sales and purchases on call, may be indicated by a comparison of changes in prices of wool with the corresponding changes in spread between these prices and prices of futures contracts. Data for the 8 years ended with 1954 show that changes over 16-week periods in spot prices of territory fine staple combing wool in Boston, particularly the larger changes, usually were considerably greater than the corresponding changes in spread between these prices and prices of New York wool futures contracts for the near-active month (table 13). Many of the smaller, and some of the larger, changes in spot prices were less than the corresponding changes in spot-futures price spreads.

During the 8 years ended 1954, changes over 16-week periods in spot prices of territory fine staple combing wool in Boston averaged about 36 percent greater than the corresponding changes in spread between these prices and prices of wool futures contracts for the near-active month (fig. 4). The proportions varied widely from year to year. In 1950 and 1951, when spot prices of wool were substantially above the Government price support level, changes in spot prices over 16-week periods averaged more than twice as great as the corresponding changes in spot-futures price spreads. During the other years included in this 8-year period, when spot prices were near the price support level, changes in spot prices over 16-week periods ranged from about 25 percent in 1947 to 185 percent in 1952 of the corresponding changes in spot-futures price spreads, and averaged less than those changes.

Changes in spot prices of wool include both advances and declines which represent gains and losses on long market interests, and losses and gains, respectively, on short market interests in wool. Changes in basis as a result of greater advances or smaller declines in spot prices than in prices of futures contracts reflect gains on long market interests in the spot commodity hedged by the sale of futures contracts, and losses on short market interests in the spot commodity hedged by the purchase of futures contracts. On the other hand, changes in basis resulting from smaller advances or greater declines in spot prices than in prices of futures contracts reflect losses on long market interests in the spot commodity hedged by the sale of futures contracts, and gains on short market interests in the spot commodity hedged by the purchase of futures contracts.

TABLE 13.—*Distribution of changes over 16-week periods in prices of territory fine staple combing wool in Boston and in basis calculated from prices of near-month futures contracts in New York, 1947-54*¹

Change in spot price (cents per pound)	Change in basis (cents per pound)											
	-45.1 and under	-45.0 to -35.1	-35.0 to -25.1	-25.0 to -15.1	-15.0 to -5.1	-5.0 to 4.9	5.0 to 14.9	15.0 to 24.9	25.0 to 34.9	35.0 and over	Total	
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
-45.1 and under	2.1	0.3	0.5	0.3	0.3	0.7	0.5	0.5	0.5	0.5	0.5	4.7
-45.0 to -35.1					.3	1.3						1.6
-35.0 to -25.1		.8	1.1	.5	.5	.5	0.5	.3				4.2
-25.0 to -15.1			1.1	1.3	1.8	.5	.3					5.0
-15.0 to -5.1				1.0	0.8	.8	3.9	1.3				7.8
-5.0 to 4.9			.5	5.5	18.3	12.2	2.1	1.3	1.3			41.2
5.0 to 14.9				2.1	7.8	4.7	5.2	.3	.3			20.4
15.0 to 24.9					2.1	1.0						3.1
25.0 to 34.9					.8							.8
35.0 and over	.3		.8	.8	1.8	2.6	3.0	1.5	1.3	1.8		11.2
Total	2.4	1.1	4.0	11.5	34.5	24.3	12.3	5.2	2.9	1.8		100.0

¹ Spot prices of wool in Boston and prices of wool futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Minus (-) signs mean losses on long market interests in wool hedged by sales of wool futures.

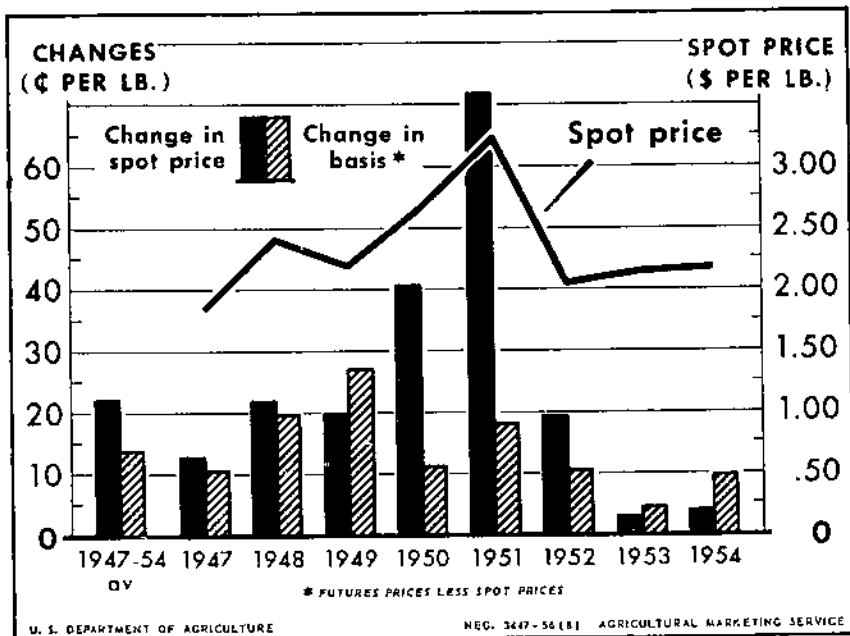


FIGURE 4.—Average changes over 16-week periods in spot prices and in basis, calculated from near-month wool futures contracts in New York, for territory fine staple combing wool, and average spot prices of this wool in Boston, 1947-54. Average changes in spot prices and in basis varied widely from year to year. The changes in spot prices were greatest in 1950 and 1951 when spot prices of wool were substantially above the Government price support level. Changes in basis during other years averaged about as great as changes in spot prices.

Changes over 16-week periods in spot prices of territory fine staple combing wool in Boston, during the 8 years ended with 1954, showed advances about two-thirds of the time, but the advances averaged less than the declines (table 14). On the average during this period, about 78 percent of the gains on long market interests, and losses on short market interests, from advances in spot prices could have been offset by the use of wool futures contracts as hedges. Furthermore, gains on long-basis positions, and losses on short-basis positions, as a result of prices of futures contracts not advancing as much as spot prices of wool, on the average, would have been more than offset by losses and gains, respectively, as a result of prices of futures contracts advancing more than spot prices of wool. The net result would have been an average loss on long-basis positions, and an average gain on short-basis positions, of about 17 percent of the average advance in spot prices.

Considerable variations from one year to another in advances in spot prices of wool and in protection afforded by futures as hedges are indicated (table 14). In 1950 and 1951, when spot prices of wool were a great deal higher than the Government price support level, price advances over 16-week periods averaged about 37 cents a pound (clean basis). About 94 percent of the gains on long-basis positions

and losses on short-basis positions, from these advances in prices, could have been offset by the use of wool futures contracts as hedges. Gains on long-basis positions, and losses on short-basis positions, as a result of prices of futures contracts not advancing as much as spot prices of wool during these 2 years, would have been more than offset, on the average, by losses and gains, respectively, as a result of prices of futures contracts advancing more than spot prices of wool. In other years, when spot prices of wool were near the price support level,

TABLE 14.—Average advance and decline, over 16-week periods, in spot prices of territory fine staple combing wool in Boston, hedge offset afforded by wool futures in New York, and gain or loss on basis, 1947-54¹

WHEN SPOT PRICES OF WOOL ADVANCED²

Year	Proportion of time	Price change	Hedge		Additional		Gain or loss (-) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
1947-----	78.4	3.5	2.3	1.2	0.5	8.8	-7.1
1948-----	81.1	20.0	8.6	11.4	.6	4.0	8.0
1949-----	50.0	5.1	4.0	1.1	9.2	5.5	4.8
1950-----	100.0	31.7	31.4	.3	0	9.7	-9.4
1951-----	25.0	59.6	48.0	11.6	0	17.0	-5.4
1952-----	59.6	6.3	3.5	2.8	.6	4.3	-.9
1953-----	75.0	2.8	1.7	1.1	.6	2.8	-1.1
1954-----	49.1	2.0	2.0	0	.2	9.4	-9.2
Average-----	66.3	14.0	10.0	3.1	1.2	6.7	-2.4

WHEN SPOT PRICES OF WOOL DECLINED

1947-----	21.6	1.0	0	1.0	0	19.3	-20.3
1948-----	18.9	8.2	7.2	1.0	8.1	.5	6.6
1949-----	50.0	16.6	2.2	14.4	2.8	5.4	-17.0
1950-----	0						
1951-----	75.0	69.9	45.2	24.7	2.9	.7	-22.5
1952-----	40.4	26.3	21.9	4.4	2.6	.9	-2.7
1953-----	25.0	1.8	0	1.8	0	5.2	-7.0
1954-----	50.9	8.0	5.6	2.4	4.9	2.2	.3
Average-----	33.7	23.2	14.2	9.0	3.2	3.6	-9.4

¹ Spot prices of wool in Boston and prices of wool futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses are calculated for long interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

changes in spot prices of wool usually were relatively small and the gains and losses from changes in basis would have averaged about as great as, or greater than, those from the corresponding changes in spot prices.

The proportions of the losses on long market interests, and gains on short market interests, from declines over 16-week periods in spot prices of wool that could have been offset by the use of futures contracts as hedges averaged about 61 percent during the 8 years ended with 1954 (table 14). In addition, losses on long-basis positions and gains on short-basis positions from greater declines in spot prices than in prices of futures contracts and from advances in prices of futures contracts would have exceeded the gains on long-basis positions, and losses on short-basis positions, from greater declines in prices of futures contracts than in spot prices of wool. The net result would have been losses on long-basis positions, and gains on short-basis positions, which would have averaged about 41 percent of the declines in spot prices. Average results would have varied widely from year to year, with the greatest declines in spot prices and the greatest offsets from futures contracts as hedges in 1951 when spot prices were substantially above the Government price-support level.

The extent of the advances and declines in spot prices of wool and the degree of protection afforded by futures contracts as hedges varied considerably from one part of the year to another (table 15). Protection afforded by futures contracts as hedges for territory fine staple combing wool was, on the average, fairly typical of that for other qualities of wool (table 16). The proportions of the gains and losses from advances and declines in spot prices of wool that could have been offset by the use of wool futures contracts as hedges for 16-week periods averaged about the same as for 8- and 24-week periods (table 17). But additional gains and losses on basis as a result of prices of futures contracts advancing more or declining more than prices of wool were such that the ratios of gains and losses from changes in basis to the corresponding changes in spot prices averaged greater for 8-week, and less for 24-week, than for 16-week periods.

Protection afforded by wool futures contracts as hedges against losses from changes in spot prices of wool during the 8 years ended with 1954 averaged about the same as that afforded by wool top futures contracts (table 17). Protection afforded by near-month futures contracts as hedges, during this period, averaged about the same as that afforded by futures contracts for the more distant months (table 18).

An examination of the data in tables 13 to 18 clearly shows that, at times, spot prices of wool fluctuate widely and that a large proportion of the gains and losses from changes in these prices could have been offset by futures contracts as hedges. At other times, particularly when prices of wool were near the price-support level, changes in prices of wool were relatively small and little, if any, reduction in gains and losses from these changes in prices could have been realized from the use of futures contracts as hedges. A practical problem for the prospective hedger is to ascertain under what conditions he may reasonably expect to be able to offset most or all of his gains and losses from changes in spot prices of wool by the use of futures contracts as

TABLE 15.—Average advance and decline, over 16-week periods, in spot prices of territory fine staple combing wool in Boston, hedge offset afforded by wool futures in New York, and gain or loss on basis, by specified periods, 1947-54¹WHEN SPOT PRICES OF WOOL ADVANCED²

16-week periods ended—	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not off-set ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
July-Sept.-----	64.4	19.0	12.3	6.7	0.8	7.0	0.5
Oct.-Nov.-----	35.7	24.8	23.1	1.7	.5	4.5	-2.3
Dec.-Feb.-----	32.6	12.8	12.3	.5	0	9.4	-8.9
Mar.-Apr.-----	70.2	5.7	2.3	3.4	4.1	4.1	3.4
May-June-----	76.2	10.7	7.8	2.9	1.7	5.3	-.7
Average-----	66.3	14.0	10.9	3.1	1.2	6.7	-2.4

WHEN SPOT PRICES OF WOOL DECLINED

July-Sept.-----	35.6	37.5	26.2	11.7	2.0	4.0	-13.7
Oct.-Nov.-----	64.3	17.5	5.7	11.8	3.7	5.1	-13.2
Dec.-Feb.-----	17.4	19.1	13.9	5.2	3.6	1.6	-3.2
Mar.-Apr.-----	29.8	18.0	14.4	3.6	1.0	2.9	-5.5
May-June-----	23.8	15.0	10.7	4.3	6.6	1.3	1.0
Average-----	33.7	23.2	14.2	9.0	3.2	3.6	-0.4

¹ Spot prices of wool in Boston and prices of wool futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses are calculated for long interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

hedges and under what conditions little, if any, benefits are to be derived from such transactions.

Prices of futures contracts that are unusually high in relation to spot prices of wool are considered favorable for short hedging and unfavorable for long hedging. Under such conditions, it appears reasonable to expect that prices of futures contracts would advance less or decline more than spot prices. Consequently, gains on long market interests in wool from advances in spot prices probably would be greater, and losses on short market interests in wool from advances in spot prices probably would be less, than the corresponding losses and gains, respectively, from declines in prices of futures contracts. Similarly, losses on long market interests in wool from declines in spot prices probably would be less, and gains on short market interests in

TABLE 16.—Average advance and decline, over 16-week periods, in spot prices of wool of specified qualities in Boston, hedge offset afforded by wool futures in New York, and gain and loss on basis, 1947-54¹

WHEN SPOT PRICES OF WOOL ADVANCED²

Quality of wool	Proportion of time	Price change	Hedge		Additional		Gain or loss (-) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
Territory combing:							
Fine staple	66.	14.0	10.9	3.1	1.2	6.7	-2.4
1/4-blood staple	57.3	14.1	11.6	2.5	1.5	6.9	-2.9
1/4-blood	57.7	10.0	9.0	1.0	2.1	9.5	-6.4
Bright fleeces staple combing:	2						
Fine	68.	14.1	10.6	3.5	2.0	6.2	-.7
1/4-blood	59.1	13.2	11.0	2.2	2.1	6.9	-2.6
	3						

WHEN SPOT PRICES OF WOOL DECLINED

Territory combing:							
Fine staple	33.7	23.2	14.2	9.0	3.2	3.6	-9.4
1/4-blood staple	42.3	17.1	10.9	6.2	2.8	5.3	-8.7
1/4-blood	42.8	13.2	9.0	4.2	3.8	5.4	-5.8
Bright fleeces staple combing:							
Fine	32.9	24.7	14.4	10.3	2.0	4.7	-13.0
1/4-blood	40.7	17.9	11.3	6.6	2.0	5.8	-10.4

¹ Spot prices of wool in Boston and prices of wool and wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses (-) are calculated for long market interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

TABLE 17.—Average advance and decline, over 8-, 16-, and 24-week periods, in spot prices of territory fine staple combing wool in Boston, hedge offset afforded by wool and wool top futures in New York, and gain or loss on basis, 1947-54¹

WHEN SPOT PRICES ADVANCED ²							
Futures contract and length of period	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
Wool futures:							
8 weeks.....	66.4	8.1	6.1	2.0	1.5	4.5	-1.0
16 weeks.....	66.3	14.0	10.9	3.1	1.2	6.7	-2.4
24 weeks.....	66.9	19.8	15.4	4.4	1.2	8.2	-2.6
Wool top futures:							
8 weeks.....	66.4	8.1	6.0	2.1	2.0	5.9	-1.8
16 weeks.....	66.3	14.0	10.6	3.4	1.9	9.1	-3.8
24 weeks.....	66.9	19.8	15.1	4.7	2.9	12.4	-4.8
WHEN SPOT PRICES DECLINED							
Wool futures:							
8 weeks.....	33.6	14.6	8.9	5.7	2.7	2.2	-5.2
16 weeks.....	33.7	23.2	14.2	9.0	3.2	3.6	-9.4
24 weeks.....	33.1	29.5	17.9	11.6	3.3	5.1	-13.4
Wool top futures:							
8 weeks.....	33.6	14.6	9.8	4.8	4.5	3.1	-3.4
16 weeks.....	33.7	23.2	16.3	6.9	5.7	5.2	-6.4
24 weeks.....	33.1	29.5	20.9	8.6	5.3	7.2	-10.5

¹ Spot prices of wool in Boston and prices of wool and wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses (—) are calculated for long market interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

TABLE 18.—Average advance and decline, over 16-week periods, in spot prices of territory fine staple combing wool in Boston, hedge offset afforded by specified futures in New York, and gain or loss on basis, 1947-54¹

WHEN SPOT PRICES OF WOOL ADVANCED²

Futures contract and active month	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
Wool futures:							
Nearest.....	66.3	14.0	10.9	3.1	1.2	6.7	-2.4
2d nearest.....	63.3	14.0	11.0	3.0	1.3	6.6	-2.3
3d nearest.....	63.3	14.0	10.9	3.1	1.5	6.2	-1.6
Wool top futures:							
Nearest.....	66.3	14.0	10.6	3.4	1.9	9.1	-3.8
2d nearest.....	63.3	14.0	10.7	3.3	2.0	9.2	-3.9
3d nearest.....	63.3	14.0	10.8	3.2	2.1	9.0	-3.7

WHEN SPOT PRICES OF WOOL DECLINED

Wool futures:							
Nearest.....	33.7	23.2	14.2	9.0	3.2	3.6	-9.4
2d nearest.....	37.7	23.2	14.4	8.8	3.2	3.2	-8.8
3d nearest.....	37.7	23.2	14.2	9.0	3.1	3.3	-9.2
Wool top futures:							
Nearest.....	33.7	23.2	16.3	6.9	5.7	5.2	-6.4
2d nearest.....	33.7	23.2	16.1	7.1	5.5	4.4	-6.0
3d nearest.....	33.7	23.2	16.0	7.2	5.7	4.1	-5.6

¹ Spot prices of wool in Boston and prices of wool and wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses (—) are calculated for long market interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

wool from declines in spot prices probably would be greater, than the corresponding gains and losses, respectively, from advances in prices of futures contracts. The net effect probably would be gains on long-basis positions, and losses on short-basis positions, regardless of whether spot prices of wool advanced or declined.

On the other hand, prices of futures contracts that are unusually low in relation to spot prices of wool are considered unfavorable for short hedging, and favorable for long hedging. Under such conditions, it appears reasonable to expect that prices of futures contracts would advance more or decline less than spot prices. Consequently, gains on long market interests in wool from advances in spot prices probably would be less, and losses on short market interests in wool from advances in spot prices probably would be greater, than the corresponding losses and gains, respectively, from declines in prices of futures contracts. Similarly, losses on long market interests in wool from declines in spot prices probably would be greater, and gains on short market interests in wool from declines in spot prices probably would be less than the corresponding gains and losses, respectively, from advances in prices of futures contracts. The net effect probably would be losses on long-basis positions, and gains on short-basis positions, regardless of whether spot prices of wool advanced or declined.

During the 8 years ended with 1954, particularly when spot prices of wool were substantially above the Government price-support level, spot prices of wool that were unusually high in relation to prices of wool futures contracts usually were succeeded by smaller advances or greater declines in spot prices of wool than in prices of futures contracts. On the other hand, spot prices of wool that were unusually low in relation to prices of futures contracts usually were followed by greater advances or smaller declines in spot prices of wool than in prices of future contracts.

During the 3 years ended April 1952, when spot prices of wool usually were substantially above the Government price-support level, spreads between spot prices of territory fine staple combing wool in Boston and prices of New York wool futures contracts for the near-active month, when related to changes in these spreads over succeeding 16-week periods, gave a correlation coefficient of -0.85 (fig. 5). In other words, about 79 percent of the changes over 16-week periods in the spot-futures price spreads for wool, during the 3 years, was associated with differences in these spreads at the beginning of the 16-week periods. The regression equation, $y = 12 - 0.77x$, indicates that, on the average, for each difference of 1 cent a pound in the spot-futures price spread, changes in this spread over the succeeding 16-week period amounted to 0.77 cent a pound in the opposite direction. The standard error of the regression coefficient was found to be 0.06.

Similar analysis of data for other parts of the 8 years ended 1954, when prices of wool usually were near the price-support level, show that spot-futures price spreads for wool at the beginning of 16-week periods, when related to changes in these spreads during the 16-week period, gave a correlation coefficient of -0.40 . This means that less than one-sixth of the changes in these spreads over 16-week periods was associated with differences in the spread at the begin-

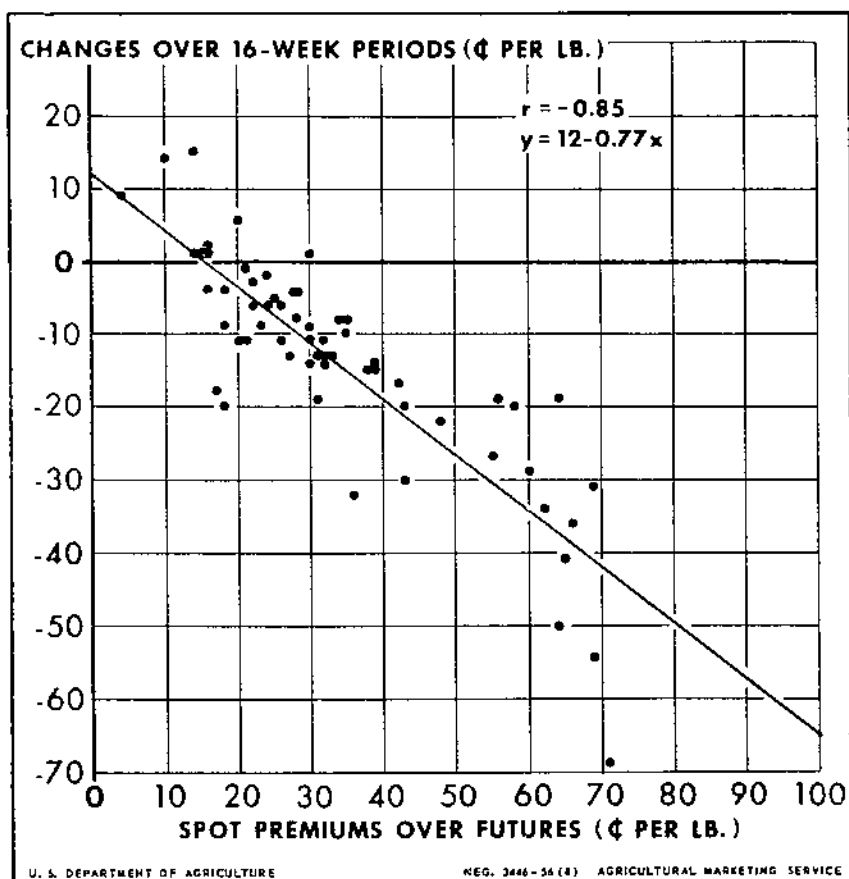


Figure 5.—Relation of premiums in spot prices of territory fine staple combing wool in Boston over prices of New York wool futures contracts to changes in these premiums over succeeding 16-week periods ended April 1949 to April 1952. During this 3-year period, changes over 16-week periods in premiums of spot prices of territory fine staple combing wool in Boston over prices of New York wool futures contracts usually varied inversely with these premiums at the beginning of the 16-week periods. The correlation coefficient was found to be -0.85 and the regression equation is $y = 12 - 0.77x$ (x =futures prices minus spot prices and y =changes in x over subsequent 16-week periods). Standard error of regression coefficient is 0.06.

ning of the 16-week period. The regression coefficient, $y = 14 - 0.48x$, indicates that, on the average, for each difference of 1 cent a pound in the spot-futures price spread, changes in this spread over the succeeding 16-week period amounted to about 0.48 cent a pound in the opposite direction. The standard error of the regression coefficient was found to be 0.15.

The relationships indicated between spot-futures price spreads for wool at specified times and subsequent changes in these spreads, and the extent to which spot prices of wool deviate from the price support level, may supply a basis for deciding when conditions are favorable, or unfavorable, for hedging operations. But the scatter of individual ob-

servations around the regression line (fig. 5), may give some indication with regard to the extent to which results of individual operations may be expected to deviate from the average results shown.

Wool tops.—The extent to which topmakers, manufacturers and others who have long- or short-market interests in wool tops could reduce or offset their risks of loss and possibilities of gain from changes in prices of wool tops by the use of futures contracts as hedges, and the gains and losses on sales and purchases of wool tops on call, may be indicated by comparisons of changes in spot prices of the tops with the corresponding changes in spread between spot prices of wool tops and prices of wool top futures contracts. Data for the 8 years ended with 1954 show that changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston, especially the larger ones, usually were considerably greater than the corresponding changes in spread between these prices and prices of New York wool top futures contracts for the near-active month (table 19). Many of the smaller, and some of the larger, changes in spot prices were less than the corresponding changes in spot-futures price spreads.

During these 8 years, changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston averaged about 61 percent greater than the corresponding changes in spread between these prices and prices of wool top futures contracts for the near-active months (fig. 6). The proportions varied widely from one year to another. In 1950 and 1951, when spot prices of wool were substantially above the Government price-support level, changes over 16-week periods in spot prices of wool tops in Boston averaged more than three times as great as the corresponding changes in spot-futures price spreads. During the other parts of this 8-year period, when spot prices of wool were near the price-support level, changes over 16-week periods in prices of wool tops ranged from about 41 percent in 1954 to about 188 percent in 1952 of the corresponding changes in spot-futures price spreads, and averaged about the same as those changes.

These changes in prices of wool tops include both advances and declines which reflect gains and losses on long market interests, and losses and gains, respectively, on short market interests in wool tops. Changes over 16-week periods in spot prices of wool tops (64s oil combed) in Boston, during the 8 years ended with 1954, showed advances about two-thirds of the time, but the advances averaged smaller than the declines (table 20). On the average, during this period, about 77 percent of the gains on long market interests, and losses on short market interests, from advances in spot prices of wool tops could have been offset by the use of wool top futures contracts as hedges. Moreover, gains on long-basis positions, and losses on short-basis positions, as a result of prices of futures contracts not advancing as much as spot prices, would have been only slightly less, on the average, than the losses on long-basis positions, and gains on short-basis positions, as a result of prices of futures contracts advancing more than spot prices. The net result would have been an average gain on long-basis positions, and an average loss on short-basis positions, of about 3 percent of the average advance in spot prices of wool tops.

TABLE 19.—Distribution of changes over 16-week periods in prices of wool tops (64s oil combed) in Boston and in basis calculated from prices of near-month futures contracts in New York, 1947-54¹

Change in spot price (cents per pound)	Change in basis (cents per pound)										Total
	-45.1 and under	-45.0 to -35.0	-35.0 to -25.1	-25.0 to -15.1	-15.0 to -5.1	-5.0 to 4.9	5.0 to 14.9	15.0 to 24.9	25.0 to 34.9	35.0 and over	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
-45.1 and under	0.3	0.5	0.7	0.3	0.5	0.5	0.3	0.3			3.4
-45.0 to -35.1		.8	.5	.5	.5	.5	1.1				3.9
-35.0 to -25.1	.8	.3	.3	.5	1.0	1.2	.8	.3			5.2
-25.0 to -15.1		1.3	.8	1.0	1.3	1.3	1.3		0.3		7.3
-15.0 to -5.1		.3	1.3	.8	1.0	1.0	.8	1.3	.3		6.8
-5.0 to 4.9			.3	3.3	9.4	9.6	1.6	1.6	.3	0.3	26.4
5.0 to 14.9		.3		2.6	5.2	6.2	4.4	.3		.8	19.8
15.0 to 24.9			.3	2.1	3.6	2.3	2.1	.8	.3	.5	12.0
25.0 to 34.9					1.3	.5	.8			1.6	4.2
35.0 and over			.5	1.3	3.4	.8	1.3	1.6	.8	1.3	11.0
Total	1.1	3.5	4.7	12.4	27.2	23.9	14.5	6.2	2.0	4.5	100.0

¹ Spot prices of wool tops (64s oil combed) in Boston and prices of wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Minus signs (-) mean losses on long market interests in wool top hedged by sales of wool top futures.

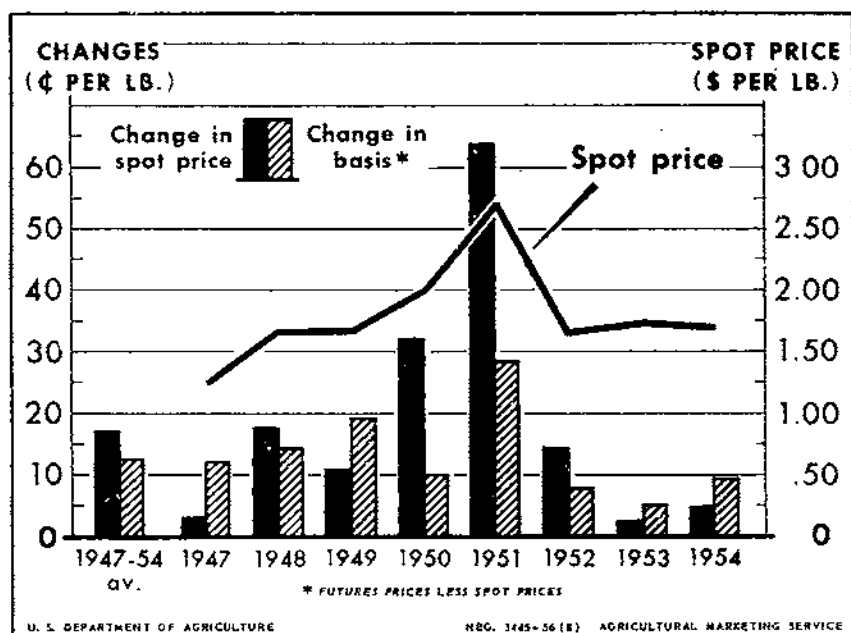


FIGURE 6.—Average changes over 16-week periods in spot prices and in basis, calculated from near-month wool top futures contracts in New York, for wool tops (64s oil combed), and average spot price of wool tops in Boston, 1947-1954. Average changes in spot prices and in basis varied widely from year to year. Changes in spot prices were greatest, absolutely and in relation to changes in basis, in 1950 and 1951, when prices of wool were substantially above the Government price-support level. Changes in spot prices during other years averaged about the same as changes in basis.

The extent of the advances in spot prices of wool tops and in protection afforded by futures as hedges varied considerably from one year to another (table 20). In 1950 and 1951, when spot prices of wool were a great deal higher than the Government price-support level, advances over 16-week periods in spot prices of wool tops in Boston averaged about 48 cents a pound and about 92 percent of the gains on long-basis positions, and losses on short-basis positions, from these advances in prices, could have been offset by the use of wool top futures contracts as hedges. During these 2 years, gains on long-basis positions, and losses on short-basis position, as a result of prices of futures contracts not advancing as much as spot prices, would have averaged less than the losses and gains, respectively, as a result of prices of futures contracts advancing more than spot prices. In other years, when spot prices of wool were near the price-support level, changes in spot prices of wool tops averaged substantially less than in 1950 and 1951, and the gains and losses from changes in basis averaged about as great as those from the corresponding changes in spot prices.

The proportion of the losses on long-basis positions, and gains on short-basis positions, from declines over 16-week periods in spot prices of wool tops that could have been offset by the use of futures contracts as hedges averaged about 66 percent, during the 8 years ended with 1954 (table 20). Moreover, losses on long-basis positions, and gains

TABLE 20.—Average advances and declines, over 16-week periods, in spot prices of wool tops (64s oil combed) in Boston, hedge offset afforded by wool top futures in New York, and gain or loss on basis, 1947-54¹

WHEN PRICES OF WOOL TOPS ADVANCED²

Year	Proportion of time	Price change	Hedge		Additional		Gain or loss (-) on basis
			Offset ³	Not off-set ⁴	Gain ⁵	Loss ⁶	
	<i>Percent</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1947-----	100.0	12.8	10.6	2.2	0.1	8.4	-6.1
1948-----	73.6	24.0	9.0	15.0	3.3	2.5	15.8
1949-----	21.2	17.8	3.5	14.3	12.1	1.1	25.3
1950-----	100.0	41.2	39.9	1.3	0	10.0	-8.7
1951-----	16.1	88.0	71.6	16.4	0	8.2	8.2
1952-----	28.8	20.7	18.0	2.7	.7	3.7	-.3
1953-----	96.2	3.3	1.9	1.4	.6	2.7	-.7
1954-----	84.9	2.3	1.4	.9	3.0	5.3	-1.4
Average-----	66.6	18.9	14.5	4.4	1.7	5.6	.5

WHEN PRICES OF WOOL TOPS DECLINED

1947-----	0						
1948-----	26.4	17.6	11.3	6.3	9.9	0	3.6
1949-----	78.8	20.5	4.6	15.9	1.2	9.8	-24.5
1950-----	0						
1951-----	83.9	68.8	54.8	14.0	2.6	.4	-11.8
1952-----	71.2	18.8	15.1	3.7	3.2	4.7	-5.2
1953-----	3.8	1.0	1.0	0	2.4	0	2.4
1954-----	15.1	12.8	10.9	1.9	9.4	0	7.5
Average-----	33.4	28.8	18.9	9.9	3.5	4.6	-11.0

¹ Spot prices of wool tops (64s oil combed) in Boston and prices of wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses are calculated for long market interests in wool tops hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

on short-basis positions, as a result of greater declines in spot prices than in prices of futures contracts and of advances in prices of futures contracts, would have greatly exceeded the gains on long-basis positions, and losses on short-basis positions, as a result of greater declines in prices of futures contracts than in spot prices of wool tops. The net result would have been losses on long-basis positions, and gains on short-basis positions, which would have averaged about 39 percent of the declines in spot prices. Average results would have varied

widely from one year to another, with the greatest declines in spot prices and the greatest offsets from futures contracts as hedges in 1951.

The extent of the advances and declines in spot prices of wool tops and the degree of protection afforded by futures contracts as hedges varied considerably from one part of the year to another (table 21). The proportions of the gains and losses from advances and declines in spot prices of wool tops in Boston that could have been offset by the use of wool top futures contracts as hedges for 16-week periods averaged more than for 8-week periods and less than for 24-week periods (table 22). Moreover, additional gains and losses on basis as a result of prices of futures contracts advancing more or declining more than spot prices of wool tops were such that the ratios of gains and losses from changes in basis to the corresponding changes in spot prices aver-

TABLE 21.—Average advance and decline, over 16-week periods, in spot prices of wool tops (64s oil combed) in Boston, hedge offset afforded by wool top futures in New York, and gain or loss on basis, by specified periods, 1947-54¹

WHEN SPOT PRICES OF WOOL TOPS ADVANCED²

16-week periods ended—	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
July-Sept.....	71.3	24.5	18.3	6.2	2.5	5.1	3.6
Oct.-Nov.....	45.7	23.3	22.3	1.0	3.2	8.2	-4.0
Dec.-Feb.....	67.4	19.5	17.1	2.4	.4	7.2	-4.4
Mar.-Apr.....	77.2	11.6	4.8	6.8	3.0	1.9	7.9
May-June.....	71.4	13.0	8.5	4.5	.1	5.8	-1.2
Average.....	66.6	18.9	14.5	4.4	1.7	5.6	.5

WHEN SPOT PRICES OF WOOL TOPS DECLINED

July-Sept.....	28.7	55.4	36.4	19.0	1.4	7.3	-24.9
Oct.-Nov.....	54.3	19.5	10.4	9.1	5.5	4.8	-8.4
Dec.-Feb.....	32.6	13.3	9.0	4.3	3.8	5.7	-6.2
Mar.-Apr.....	22.8	31.0	28.8	2.2	5.9	0	3.7
May-June.....	28.6	29.7	18.2	11.5	.8	1.1	-11.8
Average.....	33.4	28.8	18.9	9.9	3.5	4.6	-11.0

¹ Spot prices of wool tops (64s oil combed) in Boston and prices of wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses are calculated for long market interests in wool tops hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

aged greater for 8-week periods and less for 24-week periods than for 16-week periods.

Protection afforded by wool top futures contracts as hedges against losses from changes in spot prices of wool tops in Boston, during the 8 years ended with 1954, averaged slightly greater than that afforded by wool futures contracts (table 22). Protection afforded by near-month futures contracts as hedges, during this 8-year period, averaged about the same as that afforded by futures contracts for more distant months (table 23).

The data presented in tables 19 to 23 clearly show that, at times, spot prices of wool tops fluctuate widely and that a large proportion of the gains and losses from these changes in prices could have been offset by the use of futures contracts as hedges. At other times, changes in these prices were relatively small and little, if any, reductions in gains and losses from changes in prices of wool tops could have been realized from the use of futures contracts as hedges. A practical problem for those who have long or short market interests in wool tops is to ascertain under what conditions they may reasonably expect to be able to offset most, or all, of their gains and losses from changes in spot prices of wool tops by the use of futures contracts as hedges, and under what conditions, little, if any, benefits are to be derived from such transactions.

As indicated above for wool (p. 40), changes in spot-futures price spreads for wool tops as a result of greater advances or smaller declines in spot prices than in prices of futures contracts result in gains on long-basis positions, and in losses on short-basis positions. Conversely, changes in spot-futures price spreads as a result of smaller advances or greater declines in spot prices than in prices of futures contracts reflect losses on long-basis positions, and gains on short-basis positions. Information on the relation of the spreads between spot prices of wool tops and prices of wool top futures contracts to subsequent changes in these spreads should be helpful in deciding when changes in spot-futures price spreads are likely to be favorable, or unfavorable, to hedging operations.

During the 3 years ended with April 1952, when spot prices of wool usually were substantially above the Government price-support level, spreads between spot prices of wool tops (64s oil combed) in Boston and prices of New York wool top futures contracts for the near-active month, when related to changes in these spreads over the succeeding 16-week periods, gave a correlation coefficient of -0.85 (fig. 7). In other words, about three-fourths of the changes over 16-week periods in the spot-futures price spreads for wool tops, during the 3 years, was associated with differences in these spreads at the beginning of the 16-week periods. The regression equation, $y=10-0.59x$, indicates that, on the average, for each difference of 1 cent a pound in the spot-futures price spread, changes in this spread over the 16-week period amounted to 0.59 cent a pound in the opposite direction. The standard error of the regression coefficient was found to be 0.05.

A similar analysis of data for other parts of the 8 years ended with 1954, when prices of wool usually were near the price-support level, shows little, if any, statistically significant relationships between spot-futures price spreads for wool tops and subsequent changes in these spreads.

TABLE 22.—Average advance and decline, over 8-, 16-, and 24-week periods, in spot prices of wool top (64s oil combed) in Boston, hedge offset afforded by wool and wool top futures in New York, and gain or loss on basis, 1947-54¹

Futures contract and length of period	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
Wool futures:	<i>Percent</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
8 weeks.....	71.0	10.4	7.4	3.0	1.0	2.8	1.2
16 weeks.....	66.6	18.9	14.2	4.7	1.0	3.6	2.1
24 weeks.....	69.6	23.8	19.3	4.5	.9	4.3	1.1
Wool top futures:							
8 weeks.....	71.0	10.4	7.8	2.6	1.7	3.8	.5
16 weeks.....	66.6	18.9	14.5	4.4	1.7	5.6	.5
24 weeks.....	69.6	23.8	19.8	4.0	2.0	8.2	-2.2

WHEN SPOT PRICES DECLINED							
Wool futures:							
8 weeks.....	29.0	21.7	11.0	9.8	2.5	2.1	-9.4
16 weeks.....	33.4	28.8	16.2	12.6	1.6	3.1	-14.1
24 weeks.....	30.4	38.0	21.8	16.2	1.7	3.2	-17.7
Wool top futures:							
8 weeks.....	29.0	21.7	13.5	8.2	3.8	2.8	-7.2
16 weeks.....	33.4	28.8	18.9	9.9	3.5	4.6	-11.0
24 weeks.....	30.4	38.0	26.8	11.2	4.1	4.2	-11.3

¹ Spot prices of wool tops in Boston and prices of wool and wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses (—) are calculated for long market interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

TABLE 23.—Average advance and decline over 16-week periods, in spot prices of wool tops (64s oil combed) in Boston, hedge offset afforded by specified futures in New York, and gain or loss on basis, 1947-54¹

WHEN SPOT PRICES OF WOOL TOPS ADVANCED²

Futures contract and active month	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
Wool futures:	<i>Percent</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Nearest.....	66.6	18.9	14.2	4.7	1.0	3.6	2.1
2d nearest.....	66.6	18.9	14.1	4.8	1.0	3.6	2.2
3d nearest.....	66.6	18.9	13.9	5.0	1.1	3.5	2.6
Wool top futures:	<i>%</i>						
Nearest.....	66.6	18.9	14.5	4.4	1.7	5.6	.5
2d nearest.....	66.6	18.9	14.6	4.3	1.7	5.6	.4
3d nearest.....	66.6	18.9	14.5	4.4	1.7	5.4	.7

WHEN SPOT PRICES OF WOOL TOPS DECLINED

Wool futures:							
Nearest.....	33.4	28.8	16.2	12.6	1.6	3.1	-14.1
2d nearest.....	33.4	28.8	16.5	12.3	1.8	2.7	-13.2
3d nearest.....	33.4	28.8	16.6	12.2	1.9	2.7	-13.0
Wool top futures:							
Nearest.....	33.4	28.8	18.9	9.9	3.5	4.6	-11.0
2d nearest.....	33.4	28.8	18.9	9.9	3.4	3.5	-10.0
3d nearest.....	33.4	28.8	19.2	9.6	3.5	3.2	-9.3

¹ Spot prices of wool in Boston and prices of wool and wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Gains and losses (—) are calculated for long market interests in wool hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

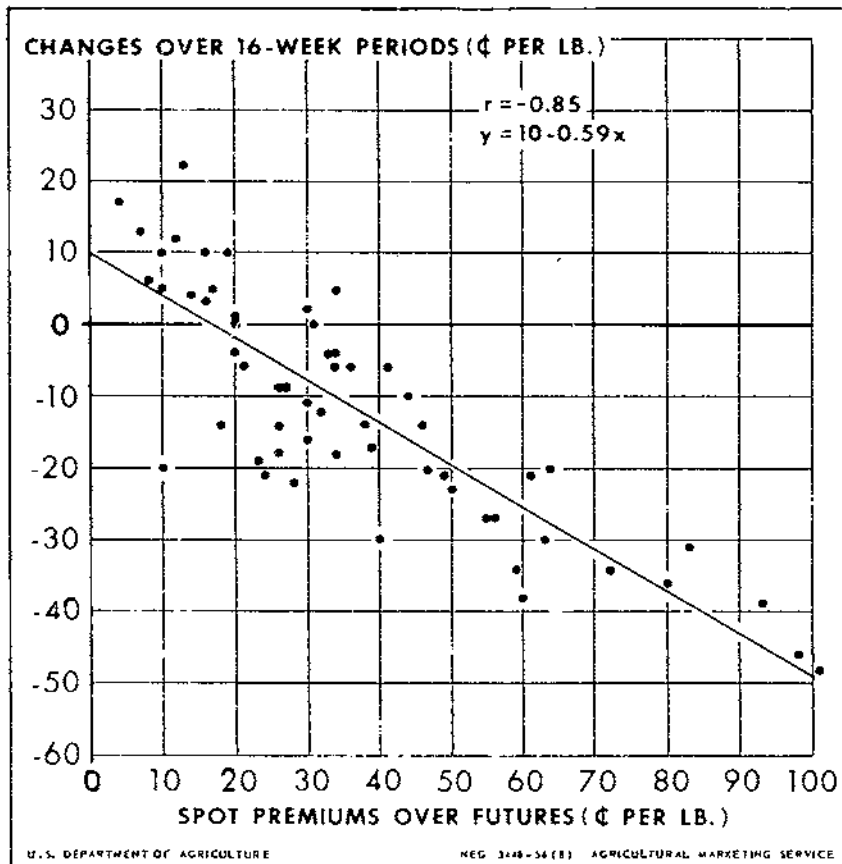


FIGURE 7.—Relation of premiums in spot prices of wool tops (64s oil combed) in Boston over prices of New York wool top futures contracts to changes in these premiums over succeeding 16-week periods ended April 1949 to April 1952. During this 3-year period, changes over 16-week periods in premiums of spot prices of wool tops (64s oil combed) in Boston over prices of New York wool top futures contracts usually varied inversely with these premiums at the beginning of the 16-week periods. The correlation coefficient was found to be -0.85 and the regression equation is $y = 10 - 0.59x$ (x = futures prices minus spot prices and y = changes in x over subsequent 16-week periods). Standard error of regression coefficient is 0.05.

Wool yarn.—The extent to which manufacturers or others who have long or short market interests in wool yarn could have reduced or offset their risks of loss and possibilities of gain from changes in prices of the yarn by the use of wool top futures contracts as hedges may be indicated by comparisons of changes in prices of yarn with the corresponding changes in spread between prices of the yarn and prices of wool top futures contracts. Changes in spread less than the corresponding changes in spot prices indicate that gains and losses from changes in prices of yarn could have been offset, at least in part, by the use of futures contracts as hedges. But changes in spread equal to, or greater than, the corresponding changes in yarn prices mean

that gains and losses from changes in these prices could not have been reduced by the use of wool top futures contracts as hedges.

Data relating to prices of the quantity of worsted weaving yarn (2/32s-64s undyed, f. o. b. mill) obtainable from a pound of wool and to prices of wool top futures contracts in New York were studied. They showed that, during the 8 years ended with 1954, changes over 4-month periods in prices of this yarn averaged about 29 percent greater than the corresponding changes in spread between prices of this yarn and prices of wool top futures contracts. These changes showed advances or no change about 57 percent of the time, and declines about 43 percent of the time. The declines averaged greater than the advances (table 24). About 61 percent of the advances in these prices could have been offset by the use of wool top futures contracts as hedges. Gains on long-basis positions, and losses on short-basis positions, from such hedging operations as a result of prices of futures contracts declining or not advancing as much as prices of the yarn, would have been offset only in part by losses on long-basis positions and gains on short-basis positions, as a result of prices of futures contracts advancing more than prices of the yarn. The net effect would have been an average gain on long-basis positions, and an average loss on short-basis positions, which would have amounted to about 23 percent of the average advance in prices of the yarn.

About one-half of the declines over 4-month periods in prices of worsted weaving yarn, during the 8 years ended with 1954, could have been offset by the use of wool top futures contracts as hedges (table 24). Losses on long-basis positions, and gains on short-basis positions, as a result of prices of yarn declining more than prices of futures contracts, would have averaged greater than the gains on long-basis positions, and losses on short-basis positions, as a result of prices of futures contracts declining more than prices of yarn. The net effect would have been an average loss on long-basis positions, and gain on short-basis positions, which would have amounted to about 58 percent of the average decline in prices of the yarn.

Extent of changes over 4-month periods in prices of worsted weaving yarn, and the proportions of the gains and losses from these changes that could have been offset by the use of wool top futures contracts as hedges, varied from year to year (table 24), and from one part of the year to another (table 25), but no very definite seasonal trends are indicated. Changes in prices of this yarn varied considerably with the length of the period, but the proportion of the gains and losses from these changes that could have been offset by the use of wool top futures as hedges averaged about the same for 2- and 6-month as for 4-month periods (table 26). Hedge offsets afforded by near-month futures contracts averaged about the same as those afforded by futures contracts for more distant months (table 27).

Similar data relating to worsted machine knitting yarn (2/20s-50s/56s, undyed) show that changes over 4-month periods in prices of the quantity of yarn obtainable from a pound of wool averaged less, and the proportion of the gains and losses from these changes in prices that could have been offset by the use of wool top futures as hedges also averaged less, than indicated for worsted weaving yarn (table 28).

TABLE 2A.—Average advance and decline, over 4-month periods, in wholesale prices of worsted weaving yarn, hedge offset afforded by wool top futures, and gain or loss on basis, 1947-54¹

WHEN SPOT PRICES OF YARN ADVANCED²

Year	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not off-set ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
1947	100.0	13.0	10.6	2.4	0.1	11.2	-8.7
1948	100.0	18.6	9.8	8.8	8.4	0	17.2
1949	33.3	5.7	1.3	4.4	10.0	0	14.4
1950	91.7	35.6	31.9	3.7	0	23.2	-19.5
1951	37.5	122.3	39.3	83.0	9.6	3.5	89.1
1952	58.3	25.6	15.1	10.5	.3	.1	10.7
1953	25.0	13.7	10.2	3.5	0	1.4	2.1
1954	16.7	.5	.5	0	0	15.8	-15.8
Average	56.8	26.6	16.3	10.3	3.5	7.8	6.0

WHEN SPOT PRICES OF YARN DECLINED

1947							
1948							
1949	66.7	18.5	1.5	17.0	3.6	11.9	-25.3
1950	8.3	23.8	0	23.8	0	32.0	-55.8
1951	62.5	128.2	80.0	48.2	0	0	-48.2
1952	41.7	45.5	23.7	21.8	4.3	2.3	-19.8
1953	75.0	14.8	4.6	10.2	.7	1.0	-10.5
1954	83.3	4.5	3.4	1.1	3.8	4.2	-1.5
Average	43.2	32.1	16.0	16.1	2.5	5.0	-18.6

¹ Based on prices of worsted weaving yarn, 2/32s-64s undyed f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn obtainable from a pound of wool, and closing prices of near-month wool top futures in New York on the same dates. Gains and losses are calculated for long interests in the yarn hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

Analysis of the relationship of the spread between spot prices of worsted weaving yarn and prices of wool top futures contracts on specified dates to subsequent changes in these spreads over 4-month periods were made as a basis for deciding when changes in the futures price relationship are likely to be favorable, or unfavorable, to hedging operations. The results indicated so much irregularity in the relationships that these spreads could not be used effectively in deciding when gains or losses are likely to be realized on hedging operations.

TABLE 25.—Average advance and decline, over 4-month periods, in wholesale prices of worsted weaving yarn, hedge offset afforded by wool top futures, and gain or loss on basis, by specified periods, 1947-54¹

WHEN SPOT PRICES OF YARN ADVANCED²

4-month periods ended—	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
July-Sept.....	56.5	21.0	15.6	5.4	2.0	16.1	-8.7
Oct.-Nov.....	50.0	30.2	26.4	3.8	8.3	6.2	5.9
Dec.-Feb.....	57.1	29.6	24.5	5.1	.9	2.6	3.4
Mar.-Apr.....	61.5	28.0	5.5	22.5	5.0	4.5	23.0
May-June.....	60.0	26.1	6.8	19.3	3.3	7.3	15.3
Average.....	56.8	26.6	16.3	10.3	3.5	7.8	6.0

WHEN SPOT PRICES OF YARN DECLINED

July-Sept.....	43.5	45.4	31.6	13.8	0.2	4.0	-18.5
Oct.-Nov.....	50.0	42.6	15.8	26.8	4.6	3.8	-26.0
Dec.-Feb.....	42.9	29.8	7.6	22.2	.9	8.4	-29.7
Mar.-Apr.....	38.5	21.8	17.5	4.3	0	2.3	-6.6
May-June.....	40.0	7.7	1.3	6.4	5.2	3.8	-2.0
Average.....	43.2	32.1	16.0	16.1	2.5	5.0	-18.6

¹ Based on prices of worsted weaving yarn, 2/32s-64s undyed f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn obtainable from a pound of wool, and closing prices of near-month wool top futures in New York on the same dates. Gains and losses are calculated for long interests in the yarn hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

Wool fabric.—Whether, and to what extent, manufacturers and others who have long or short market interests in wool fabrics could have reduced or offset their risks of loss and possibilities of gain from changes in prices of wool fabrics by the use of wool top futures contracts as hedges may be indicated by comparisons of changes in prices of the fabric with the corresponding changes in spread between these prices and prices of wool top futures contracts. As indicated for wool yarn, changes in the spot-futures price spreads less than the corresponding changes in prices of the fabrics indicate that gains and losses from changes in prices of the fabrics could have been reduced or offset, at least in part, by the use of wool top futures contracts as hedges. Changes in the spread equal to, or greater

TABLE 26.—Average advance and decline, over 2-, 4-, and 6-month periods, in spot prices of worsted yarns and fabrics, hedge offset afforded by wool top futures, and gain or loss on basis, 1947-54¹

WHEN SPOT PRICES ADVANCED ²							
Commodity and length of period	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
Worsted weaving yarn:							
2 months.....	63.3	10.7	6.7	4.0	2.4	6.8	-0.4
4 months.....	56.8	26.6	16.3	10.3	3.5	7.8	6.0
6 months.....	60.5	32.9	21.6	11.3	4.2	10.3	5.2
Worsted suiting:							
2 months.....	81.1	5.6	3.4	2.2	5.8	7.3	.7
4 months.....	70.5	12.2	9.0	3.2	5.5	10.6	-1.9
6 months.....	62.8	19.8	16.1	3.7	8.0	13.9	-2.2
WHEN SPOT PRICES DECLINED							
Worsted weaving yarn:							
2 months.....	36.7	24.0	12.3	11.7	2.6	2.9	-12.0
4 months.....	43.2	32.1	16.0	16.1	2.5	5.0	-18.6
6 months.....	39.5	45.4	19.2	26.2	4.8	7.3	-28.7
Worsted suiting:							
2 months.....	18.9	21.5	9.3	12.2	2.4	4.6	-14.4
4 months.....	29.5	26.6	12.6	14.0	7.9	7.0	-13.1
6 months.....	37.2	27.8	14.9	12.9	3.9	9.0	-18.0

¹ Based on prices of (1) worsted weaving yarn, 2/32s-64s, undyed, f. o. b. mills and men's and boys' worsted suiting, 12-13.5 oz., f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn and fabric obtainable from a pound of wool, and (2) closing prices of near-month wool top futures in New York on the same dates. Gains and losses (—) are calculated for long market interests in yarns and fabrics hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

TABLE 27.—Average advance and decline, over 4-month periods, in wholesale prices of worsted yarns and fabrics, hedge offset afforded by wool top futures, and gain or loss on basis, 1947-54.¹

WHEN SPOT PRICES ADVANCED²

Product and active futures month	Proportion of time	Price change	Hedge		Additional		Gain or loss (-) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
Worsted yarn:							
Nearest.....	56.8	26.6	16.3	10.3	3.5	7.8	6.0
2d nearest.....	56.8	26.6	16.0	10.6	3.3	7.8	6.1
3d nearest.....	55.6	27.3	16.1	11.2	3.7	7.0	7.9
Worsted suiting:							
Nearest.....	70.5	12.2	9.0	3.2	5.5	10.6	-1.9
2d nearest.....	70.5	12.2	9.1	3.1	5.3	10.6	-2.2
3d nearest.....	71.6	12.7	9.3	3.4	5.7	9.5	-1.4

WHEN SPOT PRICES DECLINED

Worsted yarn:							
Nearest.....	43.2	32.1	16.0	16.1	2.5	5.0	-18.6
2d nearest.....	56.8	32.1	15.3	16.8	2.9	5.1	-19.0
3d nearest.....	44.4	32.9	14.9	18.0	3.1	5.4	-20.3
Worsted suiting:							
Nearest.....	29.5	26.6	12.6	14.0	7.9	7.0	-13.1
2d nearest.....	29.5	26.6	11.9	14.7	8.1	6.3	-12.9
3d nearest.....	28.4	28.6	12.3	16.3	8.7	6.0	-13.6

¹ Based on prices of (1) worsted weaving yarn, 2/32s-64s, undyed, f. o. b. mill, and men's and boys' worsted suiting, 12-13.5 oz., f. o. b. mill on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn and fabric obtainable from a pound of wool, and (2) closing prices of wool top futures for specified active months in New York on the same dates. Gains and losses (-) are calculated for long market interests in yarns or fabrics hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

TABLE 28.—Average advance and decline, over 4-month periods, in wholesale prices of specified wool yarns and fabrics, hedge offset afforded by wool top futures, and gain or loss on basis, 1947-54¹WHEN SPOT PRICES ADVANCED²

Item	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
Worsted yarn:	<i>Percent</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Knitting.....	51.1	12.1	11.9	0.2	0.4	15.7	-15.1
Weaving.....	56.8	26.6	16.3	10.3	3.5	7.8	6.0
Suiting, men's and boys':							
Woolen flannel.....	50.0	9.3	7.4	1.9	4.6	15.8	-9.3
Worsted.....	70.5	12.2	9.0	3.2	5.5	10.6	1.9

WHEN SPOT PRICES DECLINED

Worsted yarn:							
Knitting.....	48.9	12.4	10.3	2.1	9.5	3.6	3.8
Weaving.....	43.2	32.1	16.0	16.1	2.5	5.0	-18.6
Suiting, men's and boys':							
Woolen flannel.....	50.0	7.3	5.3	2.0	9.9	8.5	-0.6
Worsted.....	29.5	26.6	12.6	14.0	7.9	7.0	-13.1

¹ Based on prices of (1) worsted machine knitting yarn, 2/20s-50s/56s, undyed, in oil, on skein, f. o. b. mill; worsted weaving yarn, 2/32s-64s, undyed, f. o. b. mill; men's and boys' woolen flannel suiting, stock dyed, 12-13 oz. yd. fine and medium grade 57''/60'', f. o. b. mill; and men's and boys' worsted suiting, 12-13.5 oz., f. o. b. mills, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of yarn or fabric obtainable from a pound of wool, and (2) closing prices of near-month wool top futures in New York on the same dates. Gains and losses are calculated for long market interests in yarns or fabrics hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

than, the corresponding changes in prices of the fabrics mean that gains and losses from changes in prices could not have been reduced by the use of futures contracts as hedges.

Data relating to prices of the quantity of men's and boys' worsted suiting (12-13.5 oz., f. o. b. mill) obtainable from a pound of wool and to prices of wool top futures contracts in New York show that, during the 8 years ended with 1954, changes over 4-month periods in prices of this fabric averaged greater than the corresponding changes in spread between these prices and prices of wool top futures contracts. Changes in prices of the fabric exceeded the corresponding changes in the spot futures price spreads about 48 percent of the time.

During the 8 years ended with 1954, prices of worsted fabrics showed advances or no changes, over 4-month periods, about 70 percent of the time and declines about 30 percent of the time, but the declines averaged greater than the advances (table 29). About 74 percent of the advances in these prices could have been offset by the use of wool top futures contracts as hedges. Gains on long-basis positions, and losses on short-basis positions, from such hedging operations, as a result of prices of futures contracts declining or not advancing as much as prices of the fabric, would have been more than offset by losses on long-basis positions, and gains on short-basis positions, as a result of prices of futures contracts advancing more than prices of the fabric. The net effect would have been an average loss on long-basis positions, and an average gain on short-basis positions, which would have amounted to about 16 percent of the average advance in prices of the fabric.

During the 8 years, about 47 percent of the declines over 4-month periods in prices of worsted fabric could have been offset by the use of wool top futures contracts as hedges (table 29). Losses on long-basis positions, and gains on short-basis positions, as a result of prices of futures contracts advancing or declining less than prices of the fabric, averaged substantially greater than the gains on long-basis positions, and losses on short-basis positions, as a result of prices of futures contracts declining more than prices of the fabric. The net effect would have been an average loss on long-basis positions, and an average gain on short-basis positions, which would have amounted to about 49 percent of the average decline in prices of the fabric.

Extent of changes over 4-month periods in prices of worsted fabrics, and the proportions of the gains and losses from these changes that could have been offset by the use of wool top futures as hedges, varied widely from year to year (table 29), and from one part of the year to another (table 30), but no very definite seasonal trend is indicated. Changes in prices of this fabric varied considerably with the length of the period, and the proportion of the gains and losses from these changes that could have been offset by the use of wool top futures as hedges averaged less for 2-month and more for 6-month, than for 4-month, periods (table 26). Hedge offsets afforded by near-month futures contracts averaged about the same as those afforded by futures contracts for more distant months (table 27).

TABLE 29.—Average advance and decline, over 4-month periods, in wholesale prices of worsted suiting, hedge offset afforded by wool top futures, and gain or loss on basis, 1947-54¹WHEN SPOT PRICES OF FABRICS ADVANCED²

Year	Proportion of time	Price change	Hedge		Additional		Gain or loss (-) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	Percent	Cents	Cents	Cents	Cents	Cents	Cents
1947	100.0	13.3	8.4	4.9	0.1	13.4	-8.4
1948	100.0	14.1	4.7	9.4	8.4	5.1	12.7
1949	50.0	1.8	.5	1.3	12.5	.3	13.5
1950	100.0	29.7	29.7	0	0	23.4	-23.4
1951	37.5	29.6	18.4	11.2	9.7	24.4	-3.5
1952	50.0	1.0	0	1.0	5.4	11.6	-5.2
1953	58.3	0	0	0	4.4	5.0	-.6
1954	66.7	2.5	2.5	0	9.1	3.2	5.9
Average	70.5	12.2	9.0	3.2	5.5	10.6	-1.0

WHEN SPOT PRICES OF FABRICS DECLINED

1947							
1948							
1949	50.0	15.5	0.4	15.1	0.6	15.8	-30.3
1950							
1951	62.5	73.9	48.7	25.2	31.4	0	6.2
1952	50.0	20.2	10.8	9.4	7.4	8.1	-10.1
1953	41.7	13.8	3.3	10.5	0	1.7	-12.2
1954	33.3	10.0	0	10.0	0	7.2	-17.2
Average	29.5	26.6	12.6	14.0	7.9	7.0	-13.1

¹ Based on prices of worsted suiting for men and boys, 12-13.5 ounce, f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of fabric obtainable from a pound of wool, and closing prices of near-month wool top futures in New York on the same dates. Gains and losses are calculated for long interests in the fabric hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

Similar data relating to woolen flannel suiting for men and boys (12-13 oz., 57"/60", f. o. b. mill) show that changes over 4-month periods in prices of the quantity of the fabric obtainable from a pound of wool averaged less, and the proportion of the gains and losses from these changes in prices that could have been offset by the use of wool top futures as hedges averaged about the same, as that indicated for worsted fabrics (table 28).

TABLE 30.—Average advance and decline, over 4-month periods, in wholesale prices of worsted suiting, hedge offset afforded by wool top futures, and gain or loss on basis, by specified periods, 1947-54¹

WHEN SPOT PRICES OF FABRICS ADVANCED²

4-month periods ended—	Proportion of time	Price change	Hedge		Additional		Gain or loss (—) on basis
			Offset ³	Not offset ⁴	Gain ⁵	Loss ⁶	
	<i>Percent</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
July-Sept.-----	65.2	11.3	9.8	1.5	3.1	16.5	-11.9
Oct.-Nov.-----	75.0	17.5	15.4	2.1	10.4	6.4	6.1
Dec.-Feb.-----	81.0	9.9	8.7	1.2	3.8	12.6	-7.6
Mar.-Apr.-----	61.5	12.3	4.7	7.6	5.0	5.3	7.3
May-June.-----	66.7	11.2	4.1	7.1	6.5	7.4	6.2
Average.-----	70.5	12.2	9.0	3.2	5.5	10.6	-1.9

WHEN SPOT PRICES OF FABRICS DECLINED

July-Sept.-----	34.8	24.0	17.0	7.0	20.0	8.4	4.6
Oct.-Nov.-----	25.0	61.3	26.0	35.3	0	7.6	-42.9
Dec.-Feb.-----	19.0	20.9	5.6	15.3	0	9.6	-24.9
Mar.-Apr.-----	38.5	15.8	8.6	7.2	8.9	2.3	-6
May-June.-----	33.3	18.6	4.4	14.2	0	6.7	-20.9
Average.-----	29.5	26.6	12.6	14.0	7.9	7.0	-13.1

¹ Based on prices of worsted suiting for men and boys, 12-13.5 ounce, f. o. b. mill, on the 15th of the month, as reported by Bureau of Labor Statistics, adjusted to approximate the value of the quantity of fabric obtainable from a pound of wool, and closing prices of near-month wool top futures in New York on the same dates. Gains and losses are calculated for long interests in the fabric hedged by sales of futures contracts.

² Periods showing no change in spot prices are also included.

³ Spot prices and prices of futures contracts advanced or declined the same amounts.

⁴ Extent to which advances or declines in spot prices exceeded the corresponding advances or declines in prices of futures contracts.

⁵ Extent to which prices of futures declined more than prices of spots.

⁶ Extent to which prices of futures advanced more than prices of spots.

Basis Risks Sometimes Greater Than Price Risks

Data already presented clearly show that changes in the spot-futures price spreads for wool and wool tops averaged substantially less than the corresponding changes in spot prices of these commodities. Risks of loss and possibilities of gain from changes in prices, especially when spot prices were substantially above the Government price-support level, usually could have been reduced by the use of futures contracts as hedges. But these data also show that changes in spot-futures price spreads sometimes were as great as, or greater than, the corresponding changes in spot prices of wool and wool tops. Consequently, gains and losses from changes in spot-futures price spreads at such times would have been as great as, or greater than, the corresponding changes in spot prices.

Changes over 16-week periods in spot-futures price spreads for wool equaled or exceeded the corresponding changes in spot prices 59 percent of the time, during the 8 years ended with 1954. But during 1950 and 1951, when spot prices of wool were substantially above the Government price-support level, these changes in spot-futures price spreads equaled or exceeded the corresponding changes in spot prices about 26 percent of the time. Changes in spot-futures price spreads, over 16-week periods ended in 1950 and 1951, equaled or exceeded the corresponding advances in spot prices of wool about 30 percent of the time, and they equaled or exceeded the corresponding declines in spot prices of wool about 17 percent of the time. The times when changes in spot-futures price spreads equaled or exceeded the corresponding changes in spot prices usually were confined to periods during which changes in spot prices were relatively small as compared with changes in other periods.

During the 8 years ended with 1954, changes over 16-week periods in spot-futures price spreads for wool tops equaled or exceeded the corresponding changes in spot prices about 45 percent of the time. During 1950 and 1951, when spot prices of wool usually were a great deal above the Government price-support level, these changes in spot-futures price spreads equaled or exceeded the corresponding changes in spot prices of wool tops about 11 percent of the time. Changes in spot-futures price spreads over 16-week periods ended during 1950 and 1951 equaled or exceeded the corresponding advances in spot prices of wool tops about 12 percent of the time, and they equaled or exceeded the corresponding declines in spot prices of wool tops about 8 percent of the time.

Similar data for worsted weaving yarn show that changes over 4-month periods in spread between prices of the quantity of yarn obtainable from a pound of wool and prices of wool top futures contracts, during the 8 years ended with 1954, were as great as, or greater than, the corresponding changes in spot prices of the yarn about 49 percent of the time. Changes in these spreads equaled or exceeded the corresponding advances in spot prices of the yarn about 44 percent of the time and they equaled or exceeded the corresponding declines in spot prices about 55 percent of the time.

During the same 8 years, changes over 4-month periods in spread between prices of the quantity of men's and boys' worsted suiting obtainable from a pound of wool and prices of wool top futures contracts were as great as, or greater than, the corresponding changes in spot prices of the fabric about 76 percent of the time. Changes in these spreads equaled or exceeded the corresponding advances in spot prices of the fabric about 77 percent of the time, and they equaled or exceeded the corresponding declines in spot prices about 73 percent of the time.

It is apparent from these data that during much of the 8 years ended with 1954, risks of loss and possibilities of gain from changes in prices of wool and wool products could not have been reduced by the use of futures contracts as hedges. The times when risks of loss and possibilities of gain from changes in prices could have been offset or reduced by the use of futures contracts as hedges, especially for wool and wool tops, usually included the times when gains and losses from changes in spot prices were greatest.

GAINS AND LOSSES FROM TRANSFERRING HEDGES

Risks of loss and possibilities of gain from transferring hedges may be an important consideration in connection with the use of futures contracts as hedges for wool and wool products. It is extremely difficult to learn how large a part such transfers play in the hedging operations for these products at any given time. But the maintenance of hedged positions for the large volume of wool and wool products carried in stocks, sometimes for extended periods, normally may require considerable transferring of hedges from one futures contract to another. Furthermore, differences in prices of futures contracts at times may be great enough to make it advantageous to transfer hedges long before the maturity of the futures contracts involved.

Such transfers may involve futures contracts for the same market but maturing in different months, and futures contracts for different markets but maturing in the same or different months. The transfer of hedges from futures contracts maturing in near months to those maturing in more distant months in the same market are made for long-basis positions by buying near-month futures contracts and selling, as nearly simultaneously as is feasible, futures contracts to mature in more distant months. For short-basis positions, such transfers are made by selling near-month futures contracts and buying, as nearly simultaneously as is feasible, futures contracts for the more distant months. Similarly, transfers may be made involving futures contracts for different markets but maturing in the same or in different months.

Immediate gains or losses from the transfer of hedges arise from differences between prices of the futures contracts involved. When prices of futures contracts from which hedges are transferred are high in relation to those to which hedges are transferred, the transfers result in immediate losses on long-basis positions and gains on short-basis positions. On April 7, 1950, for example, prices of wool futures contracts in New York for May delivery closed at \$1.39 a pound and those for December delivery closed at \$1.20. The transfer of hedges from the May to the December contract would have resulted in immediate losses of 19 cents a pound on long-basis positions, and in gains of 19 cents on short-basis positions. On the other hand, when prices of futures contracts from which hedges are transferred are low in relation to those to which hedges are transferred, the transfers result in immediate gains on long-basis positions and losses on short-basis positions. On June 4, 1954, for example, prices of wool future contracts for July delivery closed at \$1.62 and those for October delivery closed at \$1.74. The transfer of hedges from July to October contracts would have resulted in gains of 12 cents a pound on long-basis positions and in losses of 12 cents on short-basis positions.

Such gains and losses from transferring hedges relate to the differences between the prices of futures contracts involved at the time of the transfers, and not to net gains and losses from the whole hedging operations, including the transfer of hedges along with changes in spot-futures price spreads up to the date of liquidation of the hedged position.

The extent of the immediate gains and losses from transferring hedges may be indicated by data showing differences between prices

of the futures contracts involved. Data relating to differences between prices of wool futures contracts in New York for the near-active month and those for more distant months show that, during the 8 years ended with 1954, prices of futures contracts for the near-active month usually were higher than those for more distant months (table 31). The degree of average differences in these prices usually varied directly with the length of time between the near month and the more distant months. This means that most of the time during this 8-year period, the transfer of hedges from near-month to more distant month wool futures contracts would have resulted in immediate losses on long-basis positions, and in gains on short-basis positions.

Similar data relating to prices of wool top futures contracts in New York, during this 8-year period, show that prices of futures contracts for the near-active month usually were higher, but sometimes they were lower, than those for more distant months (table 32). The degree of average differences in these prices usually varied directly with the length of time between the near and more distant months. As indicated for wool futures, these differences in prices mean that most of the time during this 8-year period, the transfer of hedges in wool tops from near-month to more distant months would have resulted in immediate losses on long-basis positions, and in gains on short-basis positions.

Available information on costs of carrying wool and wool tops does not supply a satisfactory basis for making accurate adjustments

TABLE 31.—Average amounts by which prices of wool futures in New York for the more distant months differed from those for near-active months, by active month and year, 1947-54¹

Active futures month	1947	1948	1949	1950	1951	1952	1953	1954	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
July to—									
October.....	-3.0	-0.5	-2.2	-1.9	-2.8	-4.0	-1.6	12.5	-4
December....	-6.0	-8	-5.0	-5.0	-5.4	-6.6	-3.6	10.6	-2.7
March.....	-8.6	-3.1	-8.0	-8.1	-9.2	-8.9	-5.7	8.4	-5.4
October to—									
December....	-2.6	.1	-5.0	-3.0	-5.4	-3.5	-2.9	-2.0	-3.0
March.....	-5.2	-1.7	-8.6	-7.0	-8.7	-6.2	-5.1	-4.4	-5.9
May.....	-7.1	-2.7	-10.7	-10.0	-11.8	-8.4	-7.3	-6.4	-8.0
December to—									
March.....	-3.2	(?)	-6.2	-3.6	-2.6	-2.8	-5.1	-2.3	-3.2
May.....	-5.2	-.3	-9.4	-7.9	-3.8	-5.5	-8.8	-3.8	-5.6
July.....	-6.8	-.5	-11.8	-13.3	-6.3	-7.8	-11.6	-5.6	-8.0
March to—									
May.....	-.1	-1.5	-2.2	-2.2	-6.6	-2.2	-1.8	-3.8	-2.6
July.....	-.5	-3.0	-3.4	-4.6	-11.8	-3.6	-3.6	-6.5	-4.6
October.....	-2.0	-4.6	-4.8	-6.7	-14.6	-5.0	-5.6	-.4	-5.5
May to—									
July.....	-1.2	-.9	-1.5	-3.5	-4.5	-2.0	-1.1	-.8	-1.9
October.....	-3.3	-3.0	-3.7	-6.1	-7.3	-3.2	-2.8	7.7	-2.7
December....	-5.8	-4.5	-5.4	-9.1	-9.7	-4.1	-4.5	5.5	-4.7

¹ Prices of wool futures at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Minus (-) means that prices of futures for the more distant months were lower than prices for the near-active month.

² Less than 0.05 cent.

TABLE 32.—Average amounts by which prices of wool top futures in New York for the more distant months differed from those for near-active months, by active month and year, 1947-54¹

Active futures month	1947	1948	1949	1950	1951	1952	1953	1954	Average
July to—									
October.....	Cents -5.4	Cents -0.3	Cents -5.9	Cents 4.1	Cents -1.5	Cents -3.5	Cents -2.2	Cents 1.6	Cents -1.6
December.....	-8.5	-1.0	-10.3	.8	-4.4	-6.0	-5.5	.7	-4.3
March.....	-12.1	-3.1	-14.1	-5.5	-6.0	-8.2	-8.3	-1.5	-7.4
October to—									
December.....	-4.2	1.1	-7.0	-5.0	-4.1	-8.4	-3.0	-.5	-4.0
March.....	-9.0	.6	-11.9	-10.2	-6.7	-13.2	-6.2	-2.6	-7.4
May.....	-12.7	.2	-15.2	-15.0	-9.3	-16.1	-8.2	-3.9	-10.0
December to—									
March.....	-5.9	2.1	-8.2	-4.8	2.3	-5.3	-5.0	-1.9	-3.3
May.....	-10.1	3.2	-12.6	-9.8	1.8	-9.1	-7.9	-3.4	-6.0
July.....	-12.8	4.0	-16.9	-15.0	1.3	-12.3	-10.4	-5.1	-8.4
March to—									
May.....	-4.9	-3.5	2.2	-4.2	-3.8	1.2	-2.5	-2.4	-2.2
July.....	-11.3	-6.6	3.7	-9.0	-6.8	1.4	-4.9	-5.1	-4.8
October.....	-16.5	-9.1	3.8	-3.3	-10.0	.9	-7.3	-7.3	-6.1
May to—									
July.....	-5.2	-1.1	-1.8	-4.7	-3.0	1.1	-1.2	-1.1	-2.1
October.....	-13.1	-3.9	-4.7	.4	-5.3	1.2	-3.4	-2.5	-3.9
December.....	-16.7	-5.3	-6.1	-4.4	-8.0	.9	-5.7	-4.6	-6.2

¹ Prices of wool top futures at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Minus (—) means that prices of futures for the more distant months were lower than prices for the near-active month.

in prices for the influence of carrying charges. Consequently, the data here given relating to prices of wool and wool top futures contracts have not been adjusted for the influence of carrying costs on the differences between prices of near-month and more-distant-month futures contracts. Such adjustments would increase the extent to which prices of futures contracts for more distant months were below those for near months, and would reduce the amounts by which prices of futures contracts for more distant months exceeded those for near months, by amounts equal to the differences in carrying charges.

During the 8 years ended with 1954, prices of wool futures contracts in New York for the near-active month exceeded those for the more distant months so that the transfer of hedges from the near to the more distant month futures would have resulted in losses on long-basis positions, and in gains on short-basis positions, about 92 percent of the time. The amounts of these losses and gains would have averaged about 5.2 cents a pound (table 33). These losses and gains would have exceeded 5 cents a pound about 29.5 percent of the time and they would have exceeded 9 cents about 10 percent of the time.

Prices of near-month futures contracts were lower than those for more distant months, so that the transfer of hedges from near to more distant futures would have resulted in gains on long-basis positions, and in losses on short-basis positions, about 5.7 percent of the time (table 33). These gains and losses would have averaged 5.7 cents a pound, and they would have amounted to 3 cents a pound or more about 2.5 percent of the time.

TABLE 33.—Differences between prices of wool futures in New York for delivery in specified months, 1947-54¹

Item	Differences between prices of futures for delivery in—								
	July and—			October and—			December and—		
	October	December	March	December	March	May	March	May	July
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -15.0-----			1.5			2.9			1.4
-15.0 to -13.1-----		1.4	2.9			2.9			12.9
-13.0 to -11.1-----	1.5		2.9		3.8	12.4		2.9	10.0
-11.0 to -9.1-----		2.9	8.7		7.6	17.1		11.4	8.6
-9.0 to -7.1-----		5.8	31.9	3.8	19.1	20.9	2.9	14.2	22.9
-7.0 to -5.1-----	2.9	29.0	27.5	10.5	29.5	28.6	12.9	24.3	21.4
-5.0 to -3.1-----	15.9	31.9	4.3	31.4	25.7	5.7	28.5	25.7	10.0
-3.0 to -1.1-----	50.7	7.3	7.2	40.0	10.5	8.6	40.0	8.6	1.4
-1.0 to 0.9-----	13.0	7.3	1.5	12.4	3.8	.9	15.7	12.9	11.4
1.0 to 2.9-----	2.9	1.4		1.9					
3.0 to 4.0-----	1.5	1.4							
5.0 and over-----	11.6	11.6	11.6						
Total-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ² -----	17.4	14.5	11.6	2.9	0	0	5.7	1.4	1.4
Loss ² -----	82.6	85.5	88.4	88.6	99.0	100.0	91.4	94.3	97.1
Average change-----	<i>Cents</i> 3.7	<i>Cents</i> 5.5	<i>Cents</i> 7.6	<i>Cents</i> 3.1	<i>Cents</i> 7.4	<i>Cents</i> 8.1	<i>Cents</i> 3.2	<i>Cents</i> 5.5	<i>Cents</i> 7.8
Gain-----	8.9	9.0	8.4	1.0			.6	.6	.6
Loss-----	2.6	4.9	7.5	3.5	7.4	8.1	3.5	5.9	8.1
Maximum:									
Gain-----	14.5	12.4	10.4	1.5			.7	.6	.6
Loss-----	11.9	14.9	17.5	8.0	13.0	16.0	7.5	11.5	15.5

Item	Differences between prices of futures for delivery in—						Total
	March and—			May and—			
	May	July	October	July	October	December	
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -15.0.....		2.0	3.0				0.8
-15.0 to -13.1.....		1.0	2.0				1.5
-13.0 to -11.1.....			1.0			3.1	2.6
-11.0 to -9.1.....	2.0	4.0	3.0		3.1	6.2	5.1
-9.0 to -7.1.....	1.0	3.0	10.0	1.6		14.1	10.1
-7.0 to -5.1.....	4.0	23.0	34.0	1.6	17.2	15.7	19.4
-5.0 to -3.1.....	19.0	36.0	21.0	9.4	31.3	42.2	22.6
-3.0 to -1.1.....	53.0	22.0	14.0	53.1	31.3	4.7	23.5
-1.0 to 0.9.....	20.0	9.0	12.0	31.2	3.1		10.1
1.0 to 2.9.....	1.0			3.1		3.1	.8
3.0 to 4.9.....					3.1	4.7	.6
5.0 and over.....					10.9	6.2	2.9
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	3.0	2.0	5.0	4.7	14.1	14.1	5.7
Loss ²	92.0	96.0	95.0	90.6	84.4	85.9	92.1
Average change.....	<i>Cents</i> 2.6	<i>Cents</i> 4.6	<i>Cents</i> 5.4	<i>Cents</i> 1.8	<i>Cents</i> 4.4	<i>Cents</i> 5.8	<i>Cents</i> 5.1
Gain.....	.8	.4	.4	1.3	7.7	5.5	5.7
Loss.....	2.8	4.8	5.6	2.0	4.0	5.8	5.2
Maximum:							
Gain.....	1.5	.5	.8	1.8	13.5	11.7	14.5
Loss.....	10.5	17.5	20.4	7.2	10.0	13.0	20.4

¹ Prices of wool futures at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc. were used. Differences are derived by subtracting prices of near month from prices of more distant month futures.

² Gain and loss from transferring long hedges from near month to more distant month futures.

Similar data for wool top futures contracts show that, during this 8-year period, prices of near-month contracts exceeded those for the more distant months so that the transfer of hedges from the near to the more distant futures would have resulted in immediate losses on long-basis positions, and in gains on short-basis positions, about 80 percent of the time (table 34). The amounts of the losses and gains would have averaged 7 cents a pound. They would have exceeded 5 cents a pound 47 percent of the time and they would have exceeded 9 cents 22.4 percent of the time.

Prices of near wool top futures contracts were lower than those for more distant months so that the transfer of hedges from near to more distant month futures would have resulted in gains on long-basis positions, and in losses on short-basis positions, about 18 percent of the time (table 34). These gains and losses would have amounted to 3 cents a pound or more 5.7 percent of the time and would have averaged 2.3 cents.

Prices of wool top futures contracts usually are substantially higher than the corresponding prices of wool futures contracts. Consequently, the transfer of hedges from wool futures to wool top futures contracts usually would result in immediate gains on long-basis positions and in immediate losses on short-basis positions.

Immediate gains and losses from transferring hedges from one futures contract to another may be offset, in whole or in part, by differences in changes in the spot-futures price spreads calculated from the futures contracts to which the hedge was transferred and those calculated from futures contracts from which the hedge was transferred between the time of the transfer and the time of liquidating the hedged position. When the changes in spot-futures price spreads calculated from futures contracts to which the hedge was transferred are the same as those calculated from futures contracts to which the hedge was transferred, the immediate gains and losses from transferring hedges are offset by losses and gains, respectively, from differences between prices of the futures contracts involved at the time the hedged position is liquidated. Under such conditions, no net gains or losses are realized at the end of the hedging period from transferring hedges, aside from the costs of making the transfers and, perhaps, small differences in costs as a result of the differences in prices of the futures contracts involved.

When advances in basis (spot prices advancing more or declining less than prices of futures contracts) calculated from futures contracts to which the hedge was transferred are greater than those calculated from futures contracts to which the hedge was transferred, immediate gains on long-basis positions and immediate losses on short-basis positions, as a result of the transfer, are supplemented by the extent of the differences in changes in basis. When advances in basis calculated from futures contracts to which the hedge was transferred are less than those calculated from futures contracts from which the hedge was transferred, the immediate gains on long-basis positions and immediate losses on short-basis positions, as a result of the transfer, are offset to the extent of the differences in changes in basis.

On the other hand, when declines in basis (spot prices advancing less or declining more than prices of futures contracts) calculated

TABLE 34.—Differences between prices of wool top futures in New York for delivery in specified months, 1947-54¹

Item	Differences between prices of futures for delivery in—								
	July and—			October and—			December and—		
	October	December	March	December	March	May	March	May	July
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -15.0.....			7.3		5.8	22.8			15.7
-15.0 to -13.1.....			5.9	0.9	4.8	14.3		5.7	21.4
-13.0 to -11.1.....		7.1	8.8		12.5	13.3		15.7	5.7
-11.0 to -9.1.....		8.6	11.8	1.9	14.4	6.7	4.3	15.7	12.9
-9.0 to -7.1.....	7.2	11.4	17.6	8.5	21.1	15.2	12.9	15.7	4.3
-7.0 to -5.1.....	8.7	17.1	10.3	19.8	14.4	3.8	15.7	5.7	10.0
-5.0 to -3.1.....	14.5	18.6	19.1	30.2	6.7	9.5	21.4	12.9	4.3
-3.0 to -1.1.....	26.1	12.9	11.8	13.2	8.7	4.7	18.6	4.3	
-1.0 to 0.9.....	24.6	12.9	5.9	14.2	2.9	1.0	4.3	2.9	4.3
1.0 to 2.9.....	8.7	10.0	1.5	7.6	6.7	6.7	15.7	7.1	10.0
3.0 to 4.9.....	1.5	1.4		.9	1.0	1.0	7.1	11.4	7.1
5.0 and over.....	8.7				1.0	1.0		2.9	4.3
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	21.7	14.3	2.9	13.2	8.7	8.6	24.3	22.9	22.9
Loss ²	72.5	84.3	97.1	83.0	89.4	91.4	74.3	75.7	77.1
Average change.....	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Gain.....	3.1	4.9	7.6	4.4	8.0	10.5	4.4	7.2	9.6
Loss.....									
Maximum:									
Gain.....	3.4	1.7	1.2	1.6	2.5	2.4	2.4	2.9	3.1
Loss.....	3.3	5.6	7.8	5.0	8.7	11.3	5.1	8.6	11.5
Gain.....	6.4	3.8	2.0	3.0	5.0	6.0	4.0	5.0	6.0
Loss.....	8.5	12.5	16.5	14.7	20.9	24.7	10.2	14.8	19.5

See footnotes at end of table.

TABLE 34.—Differences between prices of wool top futures in New York for delivery in specified months, 1947-54¹—
Continued

Item	Differences between prices of futures for delivery in—						Total
	March and—			May and—			
	May	July	October	July	October	December	
Change in cents per pound:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -15.0.....			8.1			12.5	5.0
-15.0 to -13.1.....			3.0		9.4		4.3
-13.0 to -11.1.....		4.9	10.1		3.1	6.2	6.3
-11.0 to -9.1.....		11.6	4.1		4.7	4.7	6.8
-9.0 to -7.1.....		18.4	13.1	1.6	6.2	11.0	11.3
-7.0 to -5.1.....	7.9	14.5	22.2	14.1	9.4	25.0	13.3
-5.0 to -3.1.....	33.7	20.4	9.1	20.3	15.6	6.2	16.5
-3.0 to -1.1.....	27.7	4.9	4.1	26.5	14.1	7.8	12.0
-1.0 to 0.9.....	10.9	4.9	9.1	21.9	20.3	15.6	9.7
1.0 to 2.9.....	16.8	5.8	3.0	15.6	14.1	11.0	9.1
3.0 to 4.9.....	3.0	13.6	13.1		3.1		4.5
5.0 and over.....		1.0	1.0				1.2
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	25.7	24.3	21.2	21.9	23.4	15.6	17.8
Loss ²	73.3	75.7	78.8	68.8	68.8	79.7	79.9
Average change.....	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
	2.9	5.7	6.9	2.6	4.7	6.5	6.0
Gain.....	1.7	2.6	3.0	1.3	1.7	1.0	2.3
Loss.....	3.4	6.6	8.0	3.4	6.2	8.0	7.0
Maximum:							
Gain.....	3.8	5.0	5.0	2.0	4.5	2.0	6.4
Loss.....	7.0	13.0	18.9	9.0	15.0	19.4	24.7

¹ Prices of wool top futures at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. Differences are derived by subtracting prices of near month from prices of more distant month futures.

² Gain and loss from transferring long hedges from near month to more distant month futures.

from futures contracts to which the hedge was transferred are greater than those calculated from futures contracts from which the hedge was transferred, immediate losses on long-basis positions and immediate gains on short-basis positions, as a result of the transfer, are supplemented by amounts equal to the differences in the changes in basis. When declines in basis, calculated from futures contracts to which the hedge was transferred, are less than those calculated from futures contracts from which the hedge was transferred, immediate losses on long-basis positions and immediate gains on short-basis positions, as a result of the transfer, are offset to the extent of the differences in changes in basis.

Immediate gains and losses from transferring hedges plus the supplements, and less the offsets, resulting from differences in changes in basis from the time of the transfer to the time of liquidating the hedged position, represent net gains and losses realized at the end of the hedging period as a result of transferring hedges. These immediate gains and losses, as already shown, are indicated by differences between the prices of the futures contracts involved. Supplements and offsets to the immediate gains and losses are indicated by data showing changes in spread between prices of the futures contracts involved. Such data also show gains and losses that could have been realized from straddle transactions. These data are presented in detail in the next section of this bulletin.

GAINS AND LOSSES FROM STRADDLE TRANSACTIONS

Prices of wool futures and of wool top futures contracts for the same market, but maturing in different months, may differ considerably as a result of differences between the immediate and prospective supply-and-demand situations and in costs of carrying wool and wool tops to the dates of maturity of the futures contracts. Similarly, prices of futures contracts in different markets, but maturing in the same or different months and calling for delivery in the same or different markets, may differ as a result of differences in terms and conditions of sale, in immediate and prospective demand-and-supply situations, and in costs of moving the products from the place of delivery to centers of consumption. Differences in these prices may vary considerably over relatively short periods. Traders may take advantage of these changes in prices in their straddle or spreading operations.

Straddling in wool or wool top futures may be accomplished by selling futures contracts the prices of which are considered relatively high and by buying as nearly simultaneously as feasible, futures contracts the prices of which are considered relatively low. It may involve futures contracts for delivery in different months in the same market, or futures contracts for different commodities and for delivery in the same or in different months and markets. Such transactions, by increasing the demand for contracts that are considered relatively low in price, and by increasing the available supply of contracts that are considered relatively high in price, tend to bring about a realignment in prices to approximate their normal relationship. Such realignment of prices results in profits, whereas further disparities in prices result in losses, to the straddlers.

Straddle transactions designed to take advantage of increases in disparities between prices are made by buying futures contracts that are considered relatively high in price but are expected to go relatively higher, and by selling, as nearly simultaneously as is feasible, contracts that are considered relatively low in price but are expected to go relatively lower. These operations tend to force prices of contracts further out of alignment. Further disparities in prices under such situations bring profits, whereas readjustments in prices to approximate their normal relationship bring losses from such straddle operations.

The volume of straddle or spreading transactions in wool and wool top futures contracts may be indicated by data relating to open straddle or spreading commitments of large traders, as reported to the Commodity Exchange Authority (28). During the year ended with June 1955, open straddle commitments of these traders in wool futures contracts in New York about the middle and end of the month averaged 1,034,000 pounds, or 12.1 percent of total open contracts. They ranged from 648,000 pounds, or 7.8 percent of total open contracts on January 15, 1955, to 1,764,000 pounds, or 17.3 percent of total open contracts, on October 31, 1954. During this same period, open straddle commitments of reporting traders in wool top futures contracts in New York averaged more than 1,500,000 pounds, or more than 9 percent of total open contracts. They ranged from about 395,000 pounds (long), or 3.4 percent of total open contracts, on January 15, 1955, to 2,300,000 pounds, or 15.3 percent of total open contracts, on September 30, 1954.

Possible gains and losses from straddle operations may be indicated by data showing changes in spread between prices of futures contracts for delivery in different months in the same market, for delivery in the same or different months in different markets, or for different products. During the 8 years ended with 1954, changes over 16-week periods in spread between prices of wool futures contracts in New York for the near-active month and those for the more distant months amounted to as much as 10.2 cents a pound and they averaged 2 cents (table 35). These changes amounted to 2.5 cents a pound or more 28 percent of the time, and to 4.5 cents or more 13.1 percent of the time. The extent of the changes varied directly with the length of the periods between delivery months.

During the 8 years, changes in these spreads would have resulted in gains on straddle positions with long market interest in near-month futures contracts 38.4 percent of the time, and in losses 56.8 percent of the time, and the gains would have averaged less than the losses (table 35). Gains would have amounted to 2.5 cents a pound or more 11.4 percent of the time, and to 4.5 cents or more 4.2 percent of the time. Losses would have amounted to more than 2.5 cents a pound 17.6 percent of the time, and to more than 4.5 cents 4.8 percent of the time. Gains and losses on straddle positions with long market interests in near-month futures contracts would have been the same as losses and gains, respectively, on straddle positions, with short market interests in near-month futures contracts. These gains and losses would have varied considerably from year to year and from one part of the season to another, but no consistent seasonal pattern was indicated.

Similar data relating to prices of wool top futures contracts in New York show that, during the 8 years ended with 1954, changes over 16-week periods in spread between prices of futures contracts for near-active months and those for more distant months amounted to as much as 17.4 cents a pound, and they averaged 3 cents (table 36). These changes amounted to 2.5 cents a pound or more 36.8 percent of the time and to 4.5 cents or more 23.3 percent of the time. The extent of these changes varied directly with the length of period between delivery months.

During the 8 years, changes in these spreads would have resulted in gains on straddle positions with long-market interest in near-month futures contracts 46.3 percent of the time, and in losses 50.9 percent of the time, and the gains would have averaged less than the losses (table 36). Gains would have amounted to 2.5 cents a pound or more 25.4 percent of the time, and to 4.5 cents or more 10.1 percent of the time. Losses would have amounted to more than 2.5 cents 23.2 percent of the time, and to more than 4.5 cents 13.2 percent of the time. As indicated for wool futures, gains and losses on straddle positions with long market interests in near-month futures contracts would have been the same as losses and gains, respectively, on straddle positions with short market interests in near-month futures contracts. These gains and losses would have varied considerably from one futures month to another.

Spreads between prices of wool futures and wool top futures contracts show considerable changes over relatively short periods and such changes may result in gains and losses from straddle operations. Data relating to changes over 16-week periods in spread between prices of wool futures and wool top futures contracts for the near-active month show that, during the 8 years ended with 1954, these changes amounted to as much as 32 cents a pound and they averaged 7.5 cents (table 37). These changes amounted to 4.5 cents a pound or more 59.8 percent of the time, and to 10.5 cents or more 28.7 percent of the time. Extent and direction of the changes varied considerably from one year to another.

These changes in spread would have resulted in gains on straddle positions with long market interests in wool futures contracts 48.6 percent of the time, and in losses 50.7 percent of the time, during the 8-year period, and the gains would have averaged less than the losses (table 37). The gains would have amounted to 4.5 cents a pound or more 30.9 percent of the time, and to 10.5 cents or more 15.2 percent of the time. The losses would have amounted to more than 4.5 cents 28.9 percent of the time, and to more than 10.5 cents 13.5 percent of the time. As indicated for straddle positions between months in the same market, gains and losses on straddle positions with long market interests in wool futures contracts would have been the same as losses and gains, respectively, on straddle positions with short market interests in wool futures contracts. These gains and losses would have varied widely from one year to another (table 37).

These data clearly indicate that changes in spread between prices of wool futures contracts and of wool top futures contracts, maturing in different months, and those between prices of wool futures contracts and wool top futures contracts, maturing in the same or in different months, may be great enough to result in substantial gains and losses

TABLE 35.—Changes over 16-week periods in spread between prices of wool futures in New York for delivery in specified months, 1947-54¹

Item	Changes between prices of wool futures maturing in—										Total
	July and—		October and—		December and—		March and—		May and—		
	October	December	December	March	March	May	May	July	July	October	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Change in cents per pound:											
Under -5.5	1.6	4.8		4.7		8.6	2.2	3.3			2.5
-5.5 to -4.6		1.6	2.0	7.1	1.4	4.3	1.1	2.2		1.7	2.3
-4.5 to -3.6		1.6	4.9	9.4	7.1	7.1	2.2	3.3		3.5	4.1
-3.5 to -2.6	3.2	6.3	11.9	10.6	8.6	7.1	9.8	10.8	1.7	12.3	8.7
-2.5 to -1.6	12.7	15.8	14.8	7.1	10.0	11.4	8.7	13.0	10.5	8.8	11.3
-1.5 to -0.6	23.8	14.3	15.8	15.3	18.6	12.9	21.7	20.6	24.6	24.6	19.0
-0.5 to 0.4	17.5	7.9	23.8	21.1	22.9	8.6	21.7	15.2	21.1	10.5	17.6
0.5 to 1.4	15.9	15.8	18.8	8.2	15.7	14.3	22.8	14.1	26.3	8.8	16.2
1.5 to 2.4	4.7	4.8	3.0	9.4	10.0	5.7	5.4	9.8	5.3	12.3	6.9
2.5 to 3.4	4.7	9.5	4.0	4.7	5.7	12.9	2.2	3.3	5.3	5.3	5.5
3.5 to 4.4	3.2	1.6	1.0	1.2		2.9	1.1	1.1	3.5	3.5	1.7
4.5 to 5.4	3.2	1.6		1.2		1.4	1.1	2.2	1.7	1.8	1.3
5.5 and over	9.5	14.4				2.8		1.1		6.9	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	49.2	47.6	36.6	28.2	35.7	41.4	34.8	33.7	45.6	40.4	38.4
Loss ²	44.4	50.8	59.4	68.2	55.7	58.6	56.5	57.6	50.9	59.6	56.8

	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Average change-----	2.1	2.9	1.6	2.2	1.6	2.7	1.5	2.0	1.3	2.3	2.0
Gain-----	2.8	3.5	1.0	1.6	1.4	2.4	1.3	1.8	1.5	3.0	2.0
Loss-----	1.7	2.4	2.0	2.5	1.9	2.9	1.8	2.4	1.2	1.9	2.1
Maximum:											
Gain-----	8.0	8.8	4.3	4.5	3.0	6.7	4.6	6.1	5.0	10.2	10.2
Loss-----	5.6	8.1	5.5	7.0	5.0	7.5	6.8	9.5	3.4	5.0	9.5

¹ Prices of wool futures at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc. were used.

² Gain and loss (—) on straddle positions with short market interests in wool futures for maturity in near months offset by long market interests in wool futures for maturity in more distant months.

TABLE 36.—Changes over 16-week periods in spread between prices of wool top futures in New York for delivery in specified months, 1947-54¹

Item	Changes between prices of wool top futures maturing in—										Total
	July and—		October and—		December and—		March and—		May and—		
	October	December	December	March	March	May	May	July	July	October	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Change in cents per pound:											
Under -5.5-----	9.6	19.1	10.9	28.7	4.3	12.8	-----	-----	5.2	8.8	9.9
-5.5 to -4.6-----	7.9	-----	7.9	3.4	4.3	4.3	-----	1.1	3.5	-----	3.3
-4.5 to -3.6-----	-----	6.3	8.9	4.6	8.6	10.0	-----	-----	-----	3.5	4.4
-3.5 to -2.6-----	4.8	7.9	5.0	5.8	7.2	12.9	2.2	5.4	-----	5.3	5.6
-2.5 to -1.6-----	11.1	4.8	7.9	8.1	10.0	1.4	6.5	12.0	5.3	3.5	7.3
-1.5 to -0.6-----	7.9	15.9	17.8	10.3	11.4	7.1	12.0	9.9	15.8	14.0	12.2
-0.5 to 0.4-----	12.7	7.9	14.9	12.6	14.3	14.3	23.9	18.5	12.3	10.5	14.8
0.5 to 1.4-----	11.1	7.9	7.9	4.6	7.1	8.6	-----	-----	-----	-----	-----
1.5 to 2.4-----	12.7	-----	5.9	3.4	5.7	-----	18.5	7.6	17.5	10.5	9.0
2.5 to 3.4-----	9.5	7.9	9.9	4.6	2.9	-----	15.2	14.1	8.8	14.0	8.1
3.5 to 4.4-----	3.2	9.5	3.0	4.6	10.0	2.9	-----	3.2	9.8	12.3	8.9
4.5 to 5.4-----	7.9	3.2	-----	4.6	5.7	7.1	2.2	4.3	3.5	8.8	6.4
5.5 and over-----	1.6	9.6	-----	4.7	8.5	18.6	2.2	10.8	-----	8.8	3.9
Total-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ² -----	47.6	41.3	29.7	28.7	42.9	38.6	62.0	60.9	59.6	57.9	43.3
Loss ² -----	50.8	55.6	65.3	69.0	52.9	61.4	32.6	37.0	38.6	42.1	50.9

	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Average change-----	2.8	4.0	2.8	4.5	2.8	4.1	1.7	2.6	2.3	3.1	3.0
Gain-----	2.5	3.6	1.9	3.3	3.3	5.2	2.1	3.2	2.4	2.8	2.9
Loss-----	3.1	4.6	3.4	5.1	2.7	3.4	1.1	1.7	2.3	3.5	3.3
Maximum:											
Gain-----	5.8	8.1	4.0	8.5	6.5	11.3	7.5	9.5	5.1	7.1	11.3
Loss-----	8.0	12.5	12.4	17.4	6.4	8.8	3.1	5.3	10.5	12.5	17.4

¹ Prices of wool top futures at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used.

² Gain and loss (—) on straddle positions with short market interests in wool top futures for maturity in near months offset by long market interests in wool top futures for maturity in more distant months.

TABLE 37.—Changes over 16-month periods in spread between prices of wool futures and of wool top futures in New York, 1947-54¹

Item	1947	1948	1949	1950	1951	1952	1953	1954	Total
Change in cents per pound:									
Under -19.5	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under -19.5				13.5					1.8
-19.5 to -16.6	8.1			5.8		1.9			1.8
-16.5 to -13.6	10.8			11.5		9.6			4.2
-13.5 to -10.6	16.2	3.8	1.9	5.8		7.7			4.2
-10.5 to -7.6	13.5	5.7	13.5	11.5		13.5			5.7
-7.5 to -4.6	8.1	1.9	25.0	9.6	3.1	9.6	5.8		7.3
-4.5 to -1.6	13.5	7.6	19.2	11.5		7.7	30.8		8.1
-1.5 to 1.4	2.7	9.4	7.7	11.5	3.1	3.8	23.1	17.0	14.1
1.5 to 4.4	19.0	11.3		5.8	9.4	5.8	21.2	43.4	14.1
4.5 to 7.4	8.1	9.4		5.8	12.5	5.8	15.4	24.5	12.0
7.5 to 10.4		13.2	9.6		9.4	17.3	3.8	13.2	8.6
10.5 to 13.4		11.3	9.6	5.8	6.2	9.6		1.9	7.1
13.5 to 16.4		9.4	7.7		28.1	1.9			5.5
16.5 to 19.4		15.1			18.8				5.0
19.5 and over		1.9			9.4				3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gain ²	27.0	75.5	28.8	21.2	96.9	44.2	48.1	58.5	48.6
Loss ²	73.0	24.5	69.2	98.8	3.1	55.8	51.9	37.7	50.7
Average change	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Average change	8.1	9.2	7.7	10.5	12.4	9.0	3.0	2.4	7.5
Gain	3.6	10.4	11.3	5.7	12.6	8.2	3.6	3.0	7.8
Loss	9.7	5.5	6.4	11.7	5.5	9.7	2.5	1.6	7.4
Maximum:									
Gain	7.0	21.0	16.2	12.0	23.6	14.2	9.8	8.3	23.6
Loss	18.5	13.3	15.0	32.0	5.5	16.9	7.5	3.8	32.0

¹ Spreads are calculated from closing prices at the end of the week of futures for the near active month.

² Gain and loss (-) on long market interests in wool futures offset by short market interests in wool top futures.

from straddle operations. The success of straddlers depends upon the accuracy of their forecasts of changes in prices. When the forecasts are based on a correct evaluation of the immediate and prospective demand-and-supply situations for the contracts involved, straddlers, by selling contracts the prices of which are considered relatively high and by buying, as nearly simultaneously as feasible, contracts the prices of which are considered relatively low, can reap profits. Also, they increase the liquidity of the market and tend to stabilize the level of prices by bringing about adjustments in differences between prices of futures contracts for delivery at different times and in different markets. Conversely, the buying of futures contracts that are considered to be above their normal relationship to prices of other contracts, with the expectation that they will go relatively higher, and the selling of futures contracts that are considered below their normal relationship to other contracts with the expectation that they will go relatively lower, tend to accentuate the disparity in prices.

A practical problem for prospective straddlers is to ascertain when prices of some futures contracts are relatively high enough, and others relatively low enough, to offer reasonable opportunity for profits from straddle transactions. To develop information on this, data on spreads between prices of near and more distant wool futures contracts were related to changes in these spreads over the succeeding 16-week periods.

The results show that when premiums in prices of near-month wool futures contracts over prices of wool futures contracts for the next succeeding active month were related to changes in these premiums over the succeeding 16-week periods, when prices of wool were substantially above the Government price-support level, a correlation coefficient of -0.55 was obtained. The regression, $y=21-1.12x$, indicates that, on the average, for each increase of 1 cent a pound in premiums in prices of near-month wool futures contracts over prices of wool futures contracts for the next succeeding active month, gains over the succeeding 16-week period from straddle transactions with short market interests in near-month futures contracts would have increased about 1.12 cents a pound. The standard error of the regression coefficient is 0.33. These results indicate some relationships between the price spreads and changes in these spreads, but the relationships are not consistent enough to serve as a reliable guide in ascertaining when it would be profitable to engage in straddle transactions between months for wool futures contracts.

Analysis of similar data relating to prices of wool top futures contracts shows that, when premiums in prices of near-month futures over prices of futures for the next succeeding active month were related to changes in these premiums over the succeeding 16-week periods, a correlation coefficient of -0.42 was obtained. The regression $y=15-0.55x$, indicates that, on the average, for each increase of 1 cent a pound in premiums in prices of near-month wool top futures contracts over prices of wool top futures for the next succeeding active month, gains over the succeeding 16-week period from straddle transactions with short market interests in near-month futures contracts would have increased about 0.55 cent a pound. The standard error of the regression coefficient is 0.23. As indicated for wool futures, some relationships between price spreads and changes

in these spreads are indicated, but they are not consistent enough to serve as a dependable guide for straddle transactions.

Spreads between prices of wool futures contracts and prices of wool top futures contracts for near-active months were related to changes in these spreads over the succeeding 16-week periods. The results for the 3 years ended April 1952, when prices of wool usually were substantially above the Government price-support level, gave a correlation coefficient of -0.32 . The regression, $y=15-0.33x$, indicates that, on the average, for each increase of 1 cent in spread between prices of wool and of wool top futures contracts, gains over the succeeding 16-week period from straddle transactions with short market interests in wool top futures contracts would have increased 0.33 cent. The standard error of the regression coefficient is 0.11. It is apparent from these results that the relationships found are too irregular to supply a dependable guide for ascertaining when and in what way it would be profitable to engage in straddle transactions between prices of wool and of wool top futures contracts.

Gains and losses from straddle transactions may be used to supplement or offset, at least in part, gains and losses from changes in spot prices and in basis. If, for example, forward sales of wool or wool tops were made on the basis of futures contracts that are relatively high in price, the price of this contract would likely advance less, or decline more, than prices of the spot commodity or other futures contracts. Such changes would result in losses to sellers and gains to buyers from such call transactions. Under such conditions, the seller may be able to offset at least a part of his losses, and the buyer may be able to supplement his gains, by gains from straddle transactions with short market interests in futures contracts that are relatively high in price, and long market interests in futures contracts that are relatively low in price.

An application of this principle may be illustrated by an example based on quoted prices in 1948. On February 6, for example, the quoted price of territory fine staple combing wool in Boston was 0.5 cent a pound higher than the closing price of wool futures for May delivery and 3.5 cents higher than wool futures for July delivery. On April 2, the spot price of this wool was 3 and 4 cents, respectively, higher than prices of May and July futures contracts. If, on February 6, this wool had been sold on call at 0.5 cent a pound on prices of May futures contracts and the call had been made on April 2, when the spot price of this wool was 3 cents higher than the price of May futures, the seller would have lost 2.5 cents a pound as a result of the changes in relative prices. If, on February 6, the seller had taken a straddle position between May and July wool futures contracts, with short-market interests in May and long-market interests in July futures, he could have liquidated his straddle position on April 2 at a gain of 2 cents a pound. Thus 80 percent of his loss on the call sale could have been offset by his gain from the straddle transaction.

Other illustrations might be given, but it is apparent upon reflection that losses to sellers on call, and on long-hedged positions, based on futures contracts that are relatively high in price, for example, and losses on purchases on call, and on short-hedged positions, based on futures contracts that are relatively low in price, may be offset, at least in part, by gains from straddle positions with short market

interests in futures contracts that are relatively high in price and long market interests in futures contracts that are relatively low in price. Normal straddle operations in conjunction with such hedged positions based on the same futures contract result in the transfer of hedges.

Obviously the offsets from such straddle operations to sellers on call, and on long-hedged positions, based on futures contracts that are relatively high in price, would represent supplementary gains to purchasers on call, and on short-hedged positions, based on the same futures contract. Similarly, offsets from straddle operations to losses on purchases on call, and on short-hedged positions, based on futures contracts that are relatively low in price, would represent supplementary gains to sellers on call, and on long-hedged positions, based on the same futures contracts.

FUTURES TRADING AND FLUCTUATIONS IN PRICES

Trading in wool futures and in wool top futures contracts may provide some protection from changes in prices of wool and wool tops, aside from offsets through hedges, by reducing the price changes.

Traditional Theory of Stabilizing Influence

The buying and selling of futures contracts by competent traders is alleged to result in less violent but more frequent fluctuations in spot prices (6, 21, 26, 17). The contention is that prices tend to be kept fairly closely in line with an accurate reflection of the basic demand-and-supply situation, mainly by speculators who are ready to buy futures contracts when an appraisal of the market situation indicates that prices are too low, and to sell futures contracts when the appraisal indicates that prices are too high. Speculators are interested in correctly predicting the changes in prices as a basis for their transactions because they make a profit when they are correct and they take a loss when they are wrong. Futures exchanges usually are equipped with facilities for readily assembling all the available data on the various factors affecting the demand for and supply of the commodity, and this information is available to speculators and others for their use in deciding when to buy or to sell.

The theory, as usually presented, is that when prices are considered to be substantially above the level justified by a correct evaluation of the basic demand-and-supply situation, the pressure in the market on the selling side is strengthened by speculators who liquidate their holdings or sell short, expecting to buy later at a lower price. Conversely, when prices are considered to be substantially below the level justified by a correct evaluation of the basic demand-and-supply situation, the pressure on the buying side is strengthened by speculators who buy contracts with which to balance their accounts or to profit from an advance in prices. Such increases in pressure on the selling side of the market when prices are considered to be too high and on the buying side when prices are considered to be too low, it is alleged, tend to keep prices approximately in line with the best composite judgment of the basic demand for and supply of the commodity.

Furthermore, futures exchanges facilitate straddle transactions which, it is said, tend to keep prices of futures contracts for delivery in different months and in different markets in adjustment (4, 1, 13). This may be accomplished by selling futures contracts the prices of which are considered higher than the basic demand-and-supply conditions warrant and by buying, as nearly simultaneously as is feasible, futures contracts the prices of which are considered lower than basic conditions warrant. As indicated in another section of this bulletin (page 79), such transactions tend to bring about readjustments in prices of futures contracts for delivery in different months and in different markets approximately in line with the basic demand-and-supply situation. This is accomplished by increasing the pressure in the market on the selling side for contracts considered relatively high in price and by increasing the pressure in the market on the buying side for contracts considered relatively low in price.

Limitations to Stabilizing Influence

Price-stabilizing and adjusting features of futures trading apparently are based, to a considerable extent at least, on the assumption of free and unrestricted competition in markets dominated largely by the transactions of traders who decide when to buy or sell on the basis of well-informed judgments regarding the basic demand-and-supply situation and prospects. But information relating to the composition and trading practices of traders in futures contracts, along with wide variations in spread between prices for different months and in different markets, indicates that transactions in futures markets at times may be notably at variance with this assumption (15, 22).

A survey made of the open contracts in wool futures and in wool top futures on October 29, 1954, shows that holders of these contracts were widely distributed throughout the United States and in a number of foreign countries (30). In addition to dealers, merchants, top-makers, manufacturers, and others connected with the wool and wool top trade, holders of open contracts in wool futures and in wool top futures represent a wide range of occupations, including farmers and ranchers, floor traders, professional speculators, capitalists, bankers, salesmen, clerical employees, craftsmen, service workers, physicians, lawyers, engineers, housewives, and retired people. These traders who apparently were not directly connected with the wool and wool top trade accounted for a substantial proportion of open contracts in wool and wool top futures (29).

As was pointed out in other publications in connection with speculators in wheat and corn futures contracts, a large proportion of these traders in wool futures and in wool top futures contracts probably are little better equipped to forecast prices than the average citizen, which means that the accuracy of their price forecasts is not likely to be much above 50 percent (15). Moreover, information relating to transactions in wheat and corn futures of large operators, who apparently were in a position to be well-informed concerning the basic supply-and-demand situation, indicates that they did not always contribute a stabilizing influence on prices of futures contracts (14).

The theory of the price stabilizing influence of trading in futures has been criticized for not giving adequate recognition to the influence

of manipulations and the kinds of trading referred to as "movement trading" (22). Increases in width and liquidity of the market as a result of trading in futures contracts, along with the participation of large numbers of poorly informed speculators trading on margins, may afford an opportunity for price manipulation. Under such conditions, an influential person or persons may affect prices considerably by buying or selling and spreading information designed to induce a following of less informed persons to buy or sell. Under such circumstances, the originator of the buying or selling movement may adroitly change his market position and profit at the expense of his less informed followers (2). Such manipulations may at times more than offset any stabilizing influences which futures trading normally may have and may result in considerable irregular variations in prices during relatively short periods.

Movement traders buy when prices are advancing and sell when prices are declining, expecting to reverse their operations when the movements in prices are checked or reversed (22). Those engaged in such trading are primarily interested in how far other traders will push the movement in prices which they are following at the time and are only incidentally concerned with what level of prices are in line with the basic demand-and-supply situation. Apparently a large proportion of professional speculators in commodity futures are traders in price movement, and such trading, it is alleged, tends to widen price swings (22). But the influence of such trading on the extent of price swings apparently depends considerably upon the position on the price "cycle" at which the transactions are concentrated. Additional information relating to the concentration of purchases and sales by movement traders at various points on the price cycle is needed as a basis for final conclusions.

Despite any price stabilizing influences that trading in futures may have, wool and wool top prices fluctuate irregularly and at times widely from one part of the season to another and from year to year. The range in prices of territory fine staple combing wool in Boston during the year sometimes amounts to more than 40 percent of the highest price, and to more than 70 percent of the lowest price. During the 8 years ended with 1954, changes during the year in prices of this wool ranged from 5 cents a pound (clean basis), or about 3 percent of the lowest price, in 1953, when prices of wool were near the Government price-support level, to \$1.33 a pound, or about 71 percent of the lowest prices during the year, in 1951, when prices of wool were substantially above the price-support level.

Similar data relating to prices of wool tops (64s oil combed) in Boston show that ranges in these prices during the year sometimes amount to more than 40 percent of the highest price, and to more than 67 percent of the lowest price. During the 8 years ended with 1954, changes during the year in prices of wool tops ranged from 5 cents a pound, or less than 3 percent of the lowest price, in 1953, when prices of wool approximated the price-support level, to \$1.55 a pound, or more than 67 percent of the lowest price, in 1951, when prices of wool were substantially above the price-support level.

As indicated earlier in this bulletin (page 8), prices of wool and of wool products change considerably over relatively short periods. In 1950, for example, prices of territory fine staple combing wool in

Boston advanced from \$1.57 a pound (clean basis) on April 7 to \$2.45 on October 6, an advance of 88 cents within 6 months; whereas, in 1951, these prices declined from \$3.18 a pound on May 4 to \$1.85 on September 7, a decline of \$1.33 a pound within about 4 months. Similar data for wool tops (64s oil combed) in Boston show that, in 1950, prices of these tops advanced from \$2.33 a pound on July 7 to \$3.38 a pound on December 1, an advance of \$1.05 within about 5 months. In 1951, these prices declined from \$3.85 a pound on January 1 to \$2.30 on September 7, a decline of \$1.55 within about 5 months.

Whether changes in prices of wool and wool products with futures trading were greater or less than they would have been without futures trading is difficult to determine statistically. Some students of futures trading have concluded that trading in futures tends to reduce the range of price fluctuations and statistical investigations are said to support this conclusion (6, 11, 1). But others maintain that conclusive evidence is lacking on this question (13, 14).

The problem of measuring statistically the effects of trading in futures on fluctuations in prices of wool and wool products is complicated by the fact that it is difficult, if not impossible, to evaluate correctly and to make accurate adjustments for the influence of other factors on changes in prices of these products. Moreover, difficulties may be involved in attempts to devise a satisfactory statistical measure of price steadiness. Consequently, caution should be exercised in interpreting the results of statistical analyses designed to show the influence of trading in futures on changes in prices of such items as wool and wool products.

Results of analyses showing differences in variability of prices of a commodity in a market before and after trading in futures was inaugurated, differences in variability of prices in markets without futures trading and in those with futures trading, and differences in degree of price variability for commodities traded in on futures exchanges and for commodities not traded in on futures exchanges have been presented as evidence of the price-leveling influence of trading in futures (13, 20). But these results may not supply a satisfactory basis for a conclusive answer to this problem, because the influence of trading in futures on fluctuations in prices may be supplemented or offset by the influence of other factors. These factors may include differences in means of communication and transportation, in marketing facilities and practices, and in other developments. Information available is not adequate for making correct adjustments for the influence of factors other than trading in futures on fluctuations in prices of wool and wool products.

Comparisons of annual fluctuations in prices of American cotton in New York and in Liverpool before and after futures trading in New York began in 1870 is an example of attempts made to show the influence of trading in futures on fluctuations in prices (13, 20). Prior to 1870, futures trading was carried on in Liverpool in the form of transactions on the basis of cotton under "to-arrive" terms. Comparisons of changes during the year in prices of cotton in New York with those in Liverpool from 1821 to the beginning of futures trading in New York in 1870 show that the changes in New York averaged relatively greater than those in Liverpool. Subsequent to the beginning of trading in cotton futures in New York in 1870, changes in

prices of cotton in New York declined in relation to those in Liverpool, and from 1900 to 1930 they averaged proportionally about the same as those in Liverpool (20).

Although these data apparently indicate that futures trading in New York may have had a stabilizing influence on cotton prices, it is not known to what extent the differences in fluctuations shown were influenced by differences in quality of the cotton, improvements in communication and transportation, developments within the market, and other factors. Since trading in futures began changes during the year in prices of cotton in New York have not been so great as before in relation to the level of prices. On the other hand, the yearly ranges in prices of cotton in New York and in Liverpool, expressed as proportions of the highest price during the year, show an upward trend from about 1885 to the early 1930's (20). Similar data relating to prices of wool and wool tops, not influenced by price support and other programs, are not available.

Futures trading, it is said, tends to level out prices during the year so that prices of the commodity at harvest time are not unduly depressed (6, 7, 21, 1). Data relating to prices of wool in Boston show considerable irregular variations from one part of the year to another. Over periods of time long enough for irregular variations to compensate each other, prices of wool in Boston during or soon after the shearing season average about as high as during the rest of the year, after due allowances are made for carrying costs. But the extent to which any such leveling of prices may be attributed to trading in futures contracts apparently depends upon whether the probable course of prices is more accurately forecast with, than without, futures trading.

Some students of futures trading have concluded that, through the medium of futures trading, anticipated changes in the demand-and-supply situation usually are reflected in current prices more accurately than they would be without futures markets (6, 13, 1). That trading in futures may indicate more clearly the probable course in prices than transactions in the spot commodity is evidenced particularly by declines in prices of new crop cotton futures contracts in relation to spot prices in anticipation of a large crop (19). But data relating to prices of wool and of wool top futures contracts are not convincing in this respect.

The problem of measuring the extent to which trading in futures markets increases the accuracy of price forecasting is complicated by the fact that there is no way of knowing what spot prices would be in the absence of futures trading. Results of analysis of data relating to prices of spot cotton and of cotton futures contracts show that anticipated changes in the demand-and-supply situation, particularly from one crop year to another, were at times more clearly indicated and were somewhat more accurately discounted in prices of futures contracts than in prices of the spot commodity for immediate delivery (19). Similar data relating to spot and futures prices of wool and wool tops show less evidence of increases in the accuracy of price forecasting as a result of trading in futures markets.

These data, and other information, indicate that futures trading tends to lessen the fluctuations in spot prices from one year to another

and may reduce the extent of changes from one part of the year to another. Futures markets, by facilitating trading, no doubt increase the frequency of changes in prices of wool and wool products and may at times increase the extent of these changes over relatively short periods. Final conclusions regarding the influences of trading in futures on fluctuations in prices of wool and wool products cannot be reached on the basis of information now available.

EFFECTS OF FUTURES TRADING ON FARM PRICES AND ON COSTS OF WOOL PRODUCTS

Protection afforded by futures contracts as hedges, any stabilizing influences that trading in futures may have, and any other uses made of trading in wool and wool top futures are of significance to wool producers and to consumers of wool products mainly because of their influence on the level of farm prices of wool and costs of wool products. Although an evaluation of the influences of trading in wool and wool top futures on farm prices of wool and on costs of wool products may be of great importance, no attempt is made to present in this bulletin an exhaustive treatment of this problem. A short statement, based on rather limited information, is made, however, as a means of giving some indications of the results normally to be expected.

The effects of trading in futures on the level of farm prices of wool and on costs of wool products to consumers at any given time or over a given period are difficult, if not impossible, to measure directly. As data are not available on prices of wool and on costs of wool products with futures trading and without futures trading, with the influence of all other factors held constant or adjustments made for their influence, it is almost impossible to ascertain by direct means what the level of farm prices of wool and costs of wool products would have been without futures trading in wool and wool tops. Any influences that trading in futures may have on these prices and costs apparently result mainly from its effects on costs of marketing wool and of manufacturing and distributing wool products (5, 11).

Hedging facilities provided by futures markets make possible reductions in costs of merchandising and manufacturing wool and wool products through reductions in risks from changes in prices and through savings in interest charges and in capital requirements (4). As previously shown, a large proportion of the gains and losses from changes in prices of wool and of wool products, during the 8 years ended with 1954, could have been offset by the use of futures contracts as hedges. Substantial proportions of the losses on short market interests in wool and wool products from advances in spot prices, and large proportions of the losses on long market interests from declines in spot prices, could have been offset by the use of futures contracts as hedges.

The influence of using futures contracts as hedges on the costs of financing the marketing and manufacturing of wool and wool products may be indicated by information showing the effects of hedging on the collateral value of these commodities. Reports on the importance of hedging to banks that extend credit and to merchants who handle farm products indicate that loans are more secure and that business can be transacted on narrower margins when the products are hedged

than when they are not hedged (32). It is reported that banks in New York, Boston, and other financial centers loan substantially larger proportions of the current market value of wool and wool products that are hedged than of similar products not hedged (8). Some banks are reported to grant lower interest rates on general credit loans to hedgers than to nonhedgers in the wool industry (8).

Furthermore, any stabilizing influence that trading in futures may have on the level of prices of wool and wool products also tends to reduce the costs of marketing wool and of manufacturing and distributing wool products by reducing the risks of loss from changes in prices. Although the evidence available is not conclusive, the information presented earlier in this bulletin indicates that trading in futures tends to reduce the extent of the changes in prices of wool and wool products from year to year and from one part of the season to another. But such trading doubtless increases the frequency of changes in prices and may at times augment the changes over relatively short periods.

Charges for, as well as benefits of, trading in futures also need to be taken into account. The bulk of the direct costs of this trading which is of special importance to wool merchants and manufacturers relates to commissions paid by hedgers and straddlers. For domestic accounts, regular commissions charged for buying or selling each futures contract for 6,000 pounds of wool, or 5,000 pound of wool tops, are \$10 for members and \$20 for nonmembers of the exchange. Straddle commissions charged are \$6.50 for members and \$12 for nonmembers of the exchange. For persons residing outside the United States and Canada, an additional charge of \$1.25 is made (25). Total commission charges that may be considered legitimate merchandising costs depend upon the number of times the wool and wool products are hedged, the number of times the hedges are transferred, and the number of straddle transactions involved in merchandising operations.

No satisfactory means are available for ascertaining to what extent the benefits to merchants and manufacturers from reductions in price risks and in capital costs through trading in futures exceed the commission charges for the hedging and other futures transactions involved. But the commission charges amount to only a fraction of a cent a pound. The fact that many dealers, merchants, topmarkers, and manufacturers continue to use futures as hedges against losses from changes in prices of wool and wool products indicates they are convinced that the benefits exceed the costs. If the benefits did not exceed the costs, the competitive position of wool merchants and of manufacturers and distributors of wool products would be weakened by the use of futures contracts as hedges. Furthermore, any stabilizing influences that trading in futures may have on the level of prices of wool and wool products would tend to reduce the costs of marketing wool and of manufacturing and distributing wool products.

Any net saving in marketing wool and in manufacturing and distributing wool products, as a result of futures trading, would make possible reductions in the margins charged for these services. Some students of futures trading have concluded that competition forces merchants and others to pass on a substantial part of these savings to wool producers in the form of higher farm prices and to consumers in

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the form of lower retail prices of wool products (7, 5). Available information is not adequate for ascertaining to what extent any such savings raise prices of wool to growers or reduce costs of wool products to consumers, but it appears reasonable to believe that both producers of wool and consumers of wool products would be benefited by such savings.

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APPENDIX

TABLE 38.—Spot prices of territory fine staple combing wool in Boston and spread between these prices and prices of wool futures in New York for delivery in specified months, 1947-54¹

Date	Spot prices of wool	Spread between prices of wool and of wool futures for delivery in—				
		March	May	July	October	December
<i>1947</i>						
Jan. 4	Cents 116.0	Cents -19.0	Cents -20.0	Cents -20.5	Cents -22.0	Cents -24.0
Feb. 7	117.0	-24.5	-24.0	-24.0	-26.0	-27.0
Mar. 1	120.0		-24.0	-24.0	-26.0	-28.5
Apr. 4	123.0	-33.0	-25.5	-27.0	-29.0	-31.0
May 2	123.0	-37.0		-28.0	-30.3	-34.0
June 6	123.0	-31.5	-33.5	-22.0	-25.5	-29.5
July 3	123.0	-23.5	-25.1		-19.0	-21.0
Aug. 1	123.0	-13.5	-15.5	-18.0	-8.5	-12.0
Sept. 5	125.0	-12.0	-14.5	-15.7	-8.0	-9.0
Oct. 3	122.0	-10.0	-13.0	-14.0		-6.1
Nov. 7	126.0	-7.0	-8.5	-10.5	-12.5	-4.0
Dec. 5	126.0	-4.5	-7.5	-8.8	-9.5	
<i>1948</i>						
Jan. 2	126.0	-4.8	-7.0	-9.0	-10.5	-11.5
Feb. 6	126.0	-5	-5	-3.5	-6.5	-8.0
Mar. 5	126.0		-3.5	-5.5	-8.5	-10.5
Apr. 2	126.0	-9.5	-3.0	-4.0	-6.0	-7.5
May 7	131.0	+4.0		7.5	7.0	+6.0
June 4	175.0	-31.0	-31.5	-28.0	-27.5	-29.0
July 2	178.0	-35.5	-37.0		-32.5	-32.5
Aug. 6	178.0	-41.6	-44.0	-45.5	-40.6	-40.6
Sept. 3	180.0	-43.0	-44.0	-44.5	-42.0	-42.0
Oct. 1	170.0	-47.0	-47.0	-47.0		-46.5
Nov. 5	170.0	-39.0	-39.5	-40.0	-40.5	-39.5
Dec. 3	175.0	-27.5	-28.0	-28.5	-28.7	
<i>1949</i>						
Jan. 7	180.0	-32.9	-35.5	-36.5	-38.0	-39.0
Feb. 4	180.0	-32.0	-35.4	-36.9	-37.9	-39.5
Mar. 4	180.0		-40.5	-42.0	-42.5	-44.5
Apr. 1	180.0	-67.0	-61.0	-62.0	-63.5	-65.5
May 6	180.0	-70.0		-63.0	-65.5	-67.5
June 3	173.0	-64.0	-66.5	-56.0	-58.0	-61.0
July 1	173.0	-63.5	-65.0		-57.0	-60.5
Aug. 5	153.0	-46.0	-48.0	-50.0	-38.0	-42.5
Sept. 2	153.0	-34.0	-35.5	-37.5	-23.0	-29.5
Oct. 7	153.0	-43.0	-45.5	-48.5		-37.5
Nov. 4	153.0	-32.5	-35.5	-38.0	-40.0	-25.5
Dec. 2	153.0	-25.4	-28.0	-31.0	-33.0	
<i>1950</i>						
Jan. 6	157.0	-24.5	-26.5	-28.3	-29.8	-33.0
Feb. 3	159.0	-28.0	-30.0	-33.0	-35.0	-36.5
Mar. 3	159.0		-24.0	-28.0	-30.0	-33.0
Apr. 7	157.0	-30.5	-17.5	-20.5	-23.5	-36.5
May 5	168.0	-25.0		-18.0	-20.5	-23.0
June 2	175.0	-22.0	-26.0	-14.5	-16.5	-19.6
July 7	178.0	-26.0	-29.0		-18.5	-22.5
Aug. 4	188.0	-18.5	-22.0	-24.5	-11.0	-15.5
Sept. 1	225.0	-17.0	-20.0	-22.8	-10.3	-12.5
Oct. 6	245.0	-35.5	-39.0	-43.5		-31.0
Nov. 3	253.0	-26.0	-30.5	-35.5	-40.0	-23.5
Dec. 1	270.0	-16.5	-22.5	-27.0	-31.0	

TABLE 38.—*Spot prices of territory fine staple combing wool in Boston and spread between these prices and prices of wool futures in New York for delivery in specified months, 1947-54*¹—Continued

Date	Spot prices of wool	Spread between prices of wool and of wool futures for delivery in—				
		March	May	July	October	December
<i>1951</i>						
Jan. 5	310.0	+2.0	-5.0	-9.0	-12.5	-16.0
May 4	318.0	-48.0		-38.0	-35.0	-35.0
June 1	313.0	-62.7	-65.0	-53.0	-55.0	-58.5
July 6	255.0	-67.0	-70.5		-58.5	-63.5
Aug. 3	255.0	-65.6	-69.6	-73.6	-57.0	-62.5
Sept. 7	185.0	-29.7	-31.7	-34.0	-20.0	-26.5
Oct. 5	193.0	-4.1	-5.0	-7.0		-2.1
Nov. 2	200.0	-19.5	-21.4	-24.0	-26.5	-17.0
Dec. 7	188.0	-12.5	-14.0	-16.0	-17.0	
<i>1952</i>						
Jan. 4	193.0	-14.0	-15.9	-17.8	-19.0	-19.9
Feb. 1	180.0	-17.5	-21.0	-22.5	-24.0	-25.8
Mar. 7	161.0		-19.0	-21.4	-22.6	-23.5
Apr. 4	159.0	-32.5	-28.0	-29.5	-30.7	-31.5
May 2	157.0	-21.0		-16.5	-19.0	-19.5
June 6	162.0	-24.9	-27.4	-15.4	-19.4	-22.3
July 3	163.0	-20.5	-22.8		-14.5	-18.0
Aug. 1	167.0	-25.9	-27.5	-29.5	-20.0	-23.5
Sept. 5	168.0	-34.2	-36.0	-37.8	-26.5	-30.7
Oct. 3	164.0	-25.0	-27.4	-29.7		-22.2
Nov. 7	173.0	-32.4	-35.5	-38.3	-40.0	-29.0
Dec. 5	173.0	-28.9	-31.7	-34.0	-36.3	
<i>1953</i>						
Jan. 2	173.0	-25.0	-27.0	-29.3	-30.9	-32.5
Feb. 6	174.0	-29.8	-31.5	-33.0	-35.5	-37.5
Mar. 6	173.0		-30.5	-31.7	-33.3	-35.3
Apr. 3	174.0	-38.5	-32.2	-33.0	-34.8	-36.8
May 1	175.0	-36.8		-30.7	-32.2	-34.3
June 5	178.0	-40.0	-41.5	-33.1	-35.5	-37.5
July 3	176.0	-41.2	-43.0		-37.6	-39.3
Aug. 7	173.0	-35.2	-37.2	-39.2	-31.2	-33.4
Sept. 4	175.0	-37.1	-39.5	-41.5	-31.5	-35.1
Oct. 2	177.0	-35.2	-38.0	-39.8		-31.3
Nov. 6	173.0	-29.2	-33.2	-36.2	-31.0	-23.2
Dec. 4	175.0	-30.5	-35.5	-38.0	-33.0	
<i>1954</i>						
Jan. 1	175.0	-28.5	-32.3	-35.5	-29.0	-31.6
Feb. 5	175.0	-27.0	-31.0	-33.5	-27.8	-30.6
Mar. 5	172.0		-28.2	-30.4	-23.9	-26.8
Apr. 2	170.0	-18.5	-20.7	-22.2	-14.5	-16.5
May 7	175.0	-17.8		-24.3	-13.6	-15.6
June 4	178.0	-8.2	-10.2	-16.2	-3.5	-5.8
July 2	175.0	-9.2	-11.2		-5.2	-7.2
Aug. 6	175.0	-8.0	-10.0	-12.0	-4.0	-5.6
Sept. 3	175.0	-19.7	-21.4	-22.7	-14.5	-16.5
Oct. 1	175.0	-14.2	-15.8	-17.5		-12.3
Nov. 5	160.0	-16.0	-13.0	-19.9	-21.3	-14.0
Dec. 3	162.0	-18.0	-20.3	-22.0	-23.9	

¹ Spot prices of territory fine staple combing wool in Boston and prices of wool futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. The spreads were obtained by subtracting spot prices from prices of futures contracts.

TABLE 39.—Spot prices of wool tops in Boston and spread between spot prices of wool tops and prices of wool top futures in New York for delivery in specified months, 1947-54¹

Date	Spot prices of wool tops	Spread between prices of wool tops and of wool top futures for delivery in—				
		March	May	July	October	December
<i>1947</i>						
Jan. 4	Cents 160.0	Cents -6.0	-10.0	-19.0	-24.0	-26.0
Feb. 1	162.0	-12.0	-17.0	-25.0	-28.0	-29.9
Mar. 1	162.0	-	-10.0	-15.5	-23.0	-27.0
Apr. 3	167.0	-35.0	-15.5	-21.0	-28.5	-32.0
May 2	165.0	-36.5	-	-20.0	-23.5	-32.0
June 6	170.0	-37.0	-40.0	-26.0	-30.0	-33.9
July 3	180.0	-37.5	-40.0	-	-31.0	-34.0
Aug. 1	180.0	-27.5	-32.5	-35.0	-19.4	-24.0
Sept. 5	185.0	-21.0	-25.5	-29.0	-13.0	-17.0
Oct. 3	190.0	-27.0	-31.0	-32.8	-	-21.0
Nov. 7	190.0	-10.0	-16.0	-19.5	-21.3	-5.5
Dec. 5	195.0	-16.5	-19.0	-24.5	-26.5	-
<i>1948</i>						
Jan. 2	195.0	-16.0	-19.5	-23.0	-25.0	-27.5
Feb. 6	197.0	-13.5	-15.0	-17.0	-20.0	-21.0
Mar. 5	205.0	-	-25.0	-29.0	-33.8	-36.0
Apr. 2	205.0	-32.5	-23.8	-25.0	-27.5	-29.0
May 7	220.0	-32.0	-	-30.5	-30.5	-31.0
June 4	230.0	-44.0	-45.0	-40.0	-41.0	-42.0
July 2	250.0	-56.0	-57.0	-	-53.2	-54.0
Aug. 6	250.0	-70.5	-71.0	-72.0	-72.0	-70.0
Sept. 3	253.0	-75.0	-75.0	-75.0	-77.0	-75.0
Oct. 1	240.0	-83.0	-83.0	-82.5	-	-84.5
Nov. 5	220.0	-52.5	-51.5	-50.5	-50.6	-55.0
Dec. 3	230.0	-50.0	-46.2	-45.0	-45.5	-
<i>1949</i>						
Jan. 7	248.0	-72.5	-71.0	-69.5	-69.5	-70.0
Feb. 4	248.0	-76.5	-74.5	-73.0	-73.0	-73.0
Mar. 4	248.0	-	-84.8	-83.0	-83.8	-83.8
Apr. 1	240.0	-100.5	-94.5	-94.5	-97.5	-99.0
May 6	225.0	-86.0	-	-75.0	-80.5	-83.5
June 3	212.0	-73.0	-75.4	-57.4	-64.0	-68.4
July 1	208.0	-66.5	-69.0	-	-57.0	-63.0
Aug. 5	205.0	-63.0	-67.0	-70.0	-52.8	-59.0
Sept. 2	205.0	-50.5	-54.0	-58.0	-40.0	-45.5
Oct. 7	190.0	-49.0	-53.0	-56.0	-	-40.0
Nov. 4	189.0	-31.2	-35.5	-40.5	-35.5	-21.0
Dec. 2	195.0	-26.0	-30.5	-35.5	-30.3	-
<i>1950</i>						
Jan. 6	206.0	-28.0	-33.0	-37.9	-31.5	-34.5
Feb. 3	212.0	-38.0	-	-	-	-
Mar. 3	212.0	-	-37.5	-43.7	-38.7	-43.5
Apr. 6	211.0	-39.5	-30.2	-35.5	-30.2	-35.5
May 5	219.0	-32.0	-	-30.9	-24.5	-28.0
June 2	229.0	-29.5	-33.0	-25.2	-19.7	-24.5
July 7	233.0	-33.5	-38.0	-	-21.7	-27.0
Aug. 4	255.0	-23.5	-27.0	-30.0	-15.0	-19.0
Sept. 1	298.0	-17.5	-23.0	-27.0	-6.5	-14.1
Oct. 6	310.0	-34.0	-39.0	-43.9	-	-30.0
Nov. 3	318.0	-27.5	-32.5	-38.0	-44.0	-22.0
Dec. 1	338.0	-26.0	-31.0	-35.0	-39.5	-24.0

TABLE 39.—Spot prices of wool tops in Boston and spread between spot prices of wool tops and prices of wool top futures in New York for delivery in specified months, 1947-54¹—Continued

Date	Spot prices of wool tops	Spread between prices of wool tops and of wool top futures for delivery in—				
		March	May	July	October	December
<i>1951</i>						
Jan. 5	385.0	-3.2	-10.5	-14.0	-16.0	-20.0
May 4	380.0	-42.5		-40.0	-40.0	-43.7
June 1	350.0	-35.5	-37.5	-28.5	-30.0	-33.5
July 6	260.0	-14.5	-18.0		-8.5	-11.5
Aug. 3	260.0	-16.1	-20.0	-23.0	-4.5	-11.5
Sept. 7	230.0	-26.0	-28.0	-30.0	-20.0	-24.0
Oct. 5	245.0	-7.0	-9.0	-9.6		-9.0
Nov. 2	240.0	-13.0	-17.5	-15.0	-16.0	-16.4
Dec. 7	233.0	-16.7	-16.0	-16.5	-16.5	
<i>1952</i>						
Jan. 4	228.0	-9.4	-8.0	-8.1	-8.5	-9.5
Feb. 1	218.0	-17.3	-17.0	-17.2	-17.8	-19.0
Mar. 7	193.0		-15.9	-15.9	-15.9	-15.9
Apr. 4	185.0	-20.3	-21.1	-19.7	-19.1	-19.7
May 2	188.0	-12.4		-9.5	-10.5	-10.8
June 6	208.0	-28.5	-30.5	-19.5	-23.5	-25.5
July 3	208.0	-22.0	-24.0		-13.7	-18.0
Aug. 1	212.0	-27.0	-30.0	-32.0	-14.0	-22.0
Sept. 5	204.0	-27.2	-31.0	-33.0	-6.3	-21.0
Oct. 3	203.0	-18.4	-20.8	-23.2		-12.5
Nov. 7	203.0	-12.5	-17.3	-20.0	-22.8	-7.5
Dec. 5	210.0	-15.0	-17.3	-21.4	-24.1	
<i>1953</i>						
Jan. 2	210.0	-11.0	-13.5	-16.5	-18.5	-20.5
Feb. 6	213.0	-19.5	-20.7	-22.7	-24.7	-27.7
Mar. 6	213.0		-19.5	-21.7	-24.2	-26.4
Apr. 3	213.0	-30.4	-22.0	-23.5	-25.5	-28.0
May 1	213.0	-25.5		-19.0	-20.5	-22.8
June 5	215.0	-27.5	-29.5	-19.0	-21.5	-24.8
July 3	215.0	-31.7	-33.3		-24.3	-28.8
Aug. 7	215.0	-27.0	-29.4	-31.5	-21.3	-25.2
Sept. 4	215.0	-30.4	-32.2	-33.9	-23.5	-27.5
Oct. 2	215.0	-26.0	-28.0	-30.6		-22.0
Nov. 6	215.0	-27.5	-30.5	-33.3	-35.4	-23.2
Dec. 4	215.0	-26.5	-30.0	-33.0	-35.0	
<i>1954</i>						
Jan. 8	215.0	-23.8	-25.0	-27.5	-29.5	-32.0
Feb. 5	215.0	-25.0	-27.2	-29.6	-31.4	-34.0
Mar. 5	215.0		-25.4	-28.2	-30.5	-32.5
Apr. 2	215.0	-26.8	-18.1	-19.5	-21.6	-23.6
May 7	218.0	-24.5		-19.8	-20.0	-22.0
June 4	218.0	-12.5	-14.5	-11.5	-8.7	-10.0
July 2	219.0	-18.0	-19.8		-16.8	-16.8
Aug. 6	220.0	-20.2	-21.0	-22.7	-17.9	-18.5
Sept. 3	223.0	-32.5	-33.8	-35.5	-28.0	-30.0
Oct. 1	223.0	-29.2	-30.5	-32.4		-26.5
Nov. 5	221.0	-43.5	-45.0	-46.9	-49.0	-41.3
Dec. 3	207.0	-29.0	-30.5	-32.7	-35.1	-27.4

¹ Spot prices of wool tops (645 oil combed) in Boston and prices of wool top futures in New York at the end of the week, as published in *Weekly Wool Trade Reports* by the Wool Associates of the New York Cotton Exchange, Inc., were used. The spreads were obtained by subtracting spot prices from prices of futures contracts.

END