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COUNTRY ELEVATOR MARGINS AND COSTS IN MARKETING KANSAS WHEAT

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SUMMARY

1. From 60 to 85 per cent of the elevators reporting attempted to buy wheat on a margin of from 4 to 6 cents a bushel.

2. The widest departures from 5- or 6-cent buying margins tend to come with radical price fluctuations at the terminal markets.

3. The limited evidence presented in this study is mostly against the idea that any great saving could be effected through a wider use of hedging in the future's market, against country purchases except perhaps in years of almost continuously declining prices such as followed 1920.

4. In much of Kansas volume of grain production varies to a greater extent than total cost of elevator operation. Average volume of grain handled per elevator varied from the three-year average from 13.2 per cent below to 18 per cent above. Average costs per elevator have varied from their three-year average from 8.4 per cent below to 12.3 per cent above.

5. This makes risk arising from possible fluctuations in size of the wheat crop the most important primary cause affecting cost per bushel of handling wheat at local elevators.

6. Local competition and variation in protein content of wheat are factors of growing importance in affecting size of buying margins in Kansas.

7. Of the total cost per bushel of operating this group of Kansas elevators about 70 to 75 per cent was fixed cost and these fixed costs are more than 96 per cent expenses for salaries, buildings, and equipment.

8. Added volume of grain handled seems to reach its maximum effect in reducing salary and wage cost per bushel when volume of 100 to 125 thousand bushels is reached.

9. To cover all legitimate costs an average buying margin of 7 or 8 cents a bushel is necessary under present operating conditions in Kansas.

10. Local consolidations and a more extensive use of well-located line elevator systems seem to offer the greatest possibilities in the way of keeping local margins low without jeopardizing the finances of the local grain business.

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R. M. Green and E. B. Ballow[2]

COUNTRY ELEVATOR MARGINS

In general about one-third of the difference between the Kansas City price of wheat, and the price of wheat at local Kansas stations is the price paid for local elevator service. The price paid for this service is frequently felt to be too high.

A public investigation as early as 1914 reported to congress that "The weakest link in the chain of marketing Kansas wheat is the country elevator. Compared with the value and difficulty of service rendered, the margin taken by the country elevator is perhaps larger than that taken by any other middleman in the marketing of wheat."[3]

Repeated investigations of costs of local elevator operation have been made since that time. The predominating idea seemed to be to find the inefficiencies that resulted in too high costs, remedy these inefficiencies in cost of operation and thereby lower the margins on which wheat is bought at country points. This would give the producer a larger share of the terminal market price. It is acknowledged by some students of the problem that such studies "have thus far proved of little immediate value SO FAR AS REDUCING MARGINS ARE CONCERNED."

This is no new experience in such lines of work. Frequently those making cost of production studies having to do with farm products have labored under the same delusion that, once costs were known, prices could be adjusted accordingly. With regard to some of these cost statistics it is now concluded in one instance at least that

1. Contribution No. 86 from the Department of Agricultural Economics, Kansas Agricultural Experiment Station, the Bureau of Agricultural Economics, United States Department of Agriculture, coöperating.

2. Mr. E. B. Ballow at the time of this study was assistant marketing specialist, Cost of Marketing Division, Bureau of Agricultural Economics, United States Department of Agriculture.

3. House Document 1271, 63d Congress, 3d Session, December 9, 1914.

4. Senate Document 40, 67th Congress, 1st Session, Report of the Federal Trade Commission on the Grain Trade, Vol. I, Country Grain Marketing, Sept. 15, 1920; Vol. IV, Middlemen's Profits and Margins, Sept. 26, 1923. Costs and Margins in Marketing, by John D. Black and H. Bruce Price, Publication No. 1868, The Annals of the American Academy of Political and Social Science, Jan., 1925. Costs and Margins in the Marketing of Kansas Wheat, 1921-'22, Preliminary Report U. S. D. A, Feb., 1924. Management Problems of Farmers' Elevators, Bulletin 224, by H. Bruce Price and Chas. M. Arthur, University of Minnesota Agricultural Experiment Station, Nov., 1925.

5. John D. Black and H. Bruce Price. Costs and Margins in Marketing, Publication 1868, The Annals of the American Academy of Political and Social Science, Jan., 1925.

"Their value in diagnosing agricultural prosperity or in providing a sound basis for price-regulating legislation, direct or indirect, is slight."[6]

The margin taken by the local elevator is nothing more than the price it charges for its services. There is perhaps little more ground for believing that the price of this service is determined by cost of production alone than that any other price is so determined. Whatever is found out about local elevator operating costs, therefore, will serve more as a guide to the individual elevator in adjusting

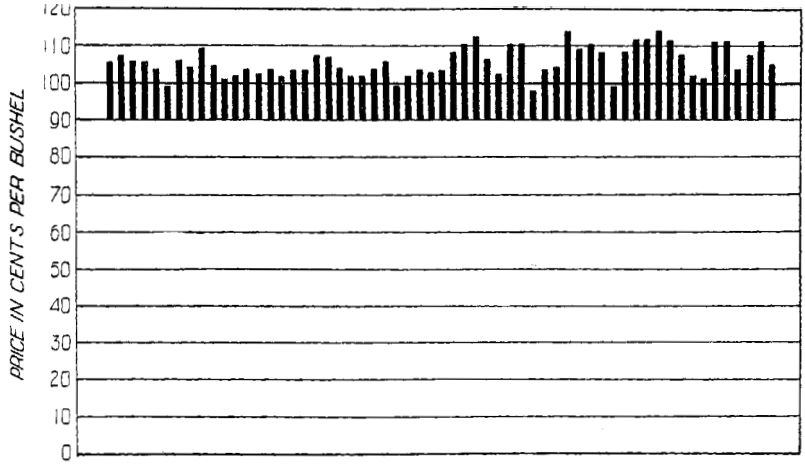

FIG. 1.—Average price paid producer per bushel of wheat ranked on competition, crop-year, 1921-'22. Each line represents price paid by an elevator. From left to right elevators increase from one to five per station.

production factors to the prevailing service-price or margin rather than as a basis for determining what the margin shall be. Cost studies in the field of local elevator operation, at least until elevator control is materially changed and centralized, can no more serve the farmer as a basis for a campaign to lower the price of local elevator service than farm cost, studies have served him in any campaign to raise the prices of farm products. His present interests in both margins and costs lie more in the direction of keeping costs with margins rather than in making margins according to costs.

THE PRICE FOR LOCAL ELEVATOR SERVICE

After deductions are made for freight and lower grade or quality, the remainder of the sum deducted from the base price (Kansas City price usually) represents the charge for service furnished by

6. Wheat Studies of the Food Research Institute, Stanford University, Vol. I, No. 6, May 1925, p. 200.

the local elevator and terminal market. This service charge is called the local elevator buying margin. It is that part of the difference between local price and terminal market price that is not accounted for in freight and grade or quality discount. It includes the services of handling, loading, and marketing the grain, and an attempted profit.

Competition (Fig. 1) and custom to a large extent establish from time to time certain margins at which elevators attempt to buy grain. This margin is by no means fixed and may vary from year to year, and from one part of the crop year to the other. It is a sort of quoted price for local elevator service.

THE ATTEMPTED BUYING MARGIN

Inquiry was made of 133 elevators in 1920, 65 elevators in 1921, and 56 elevators in 1922. as regards the margin on which they attempted to buy wheat. In 1920, 62.4 per cent of the elevators reported a buying margin of from 4 to 6 cents a bushel. For all elevators reporting the range from lowest to highest was 2 cents to 10 cents per bushel. In 1921, 66.2 per cent of the elevators reported their buying margin from 4 to 6 cents a bushel, For all elevators the range was from 2 to 8 cents a bushel. In 1922, 84 per cent' of the elevators reported a buying margin from 4 to 6 cents a bushel. For all elevators the range was 2 to 8 cents a bushel. Elevator managers indicated in their replies that this margin varied from time to time, but reported the quoted figure as the most frequent margin, or that at which they probably bought most of their wheat.

The average buying margin for 1920 was 5.95 cents; for 1921, 5.28 cents; and for 1922, 4.84 cents. The margin most frequently reported all three years was 5 cents, although in 1920 and 1921 a larger per cent than in 1922 reported margins above 6 cents a bushel.

THE ACTUAL BUYING MARGINS OF LOCAL ELEVATORS

While an elevator manager may attempt to operate on a 5-cent margin for wheat, he is not able to buy all his wheat at exactly that price differential. Competition and risk of changes in terminal market prices are two factors that will make the elevator man shift his margins, either raising them or lowering them. Also if conditions are such as to make for generally high costs of operation in certain sections, the margins there will be higher than at some other places. The individual elevator manager, however usually finds it difficult to adjust the margin he takes to his own individual costs.

The Federal Trade Commission shows actual buying margins by

subtracting the daily country price from the price (less freight) at which the greatest number of cars of the same kind and grade of grain was sold on the central market on the same days. By this method margins on No. 1 Northern spring wheat were found in 1912-'13 to be 4.64 cents per bushel; in 1913-'14, 3.24 cents; in 1914-'16 5.99 cents; in 1915-'16, 5.50 cents; and in 1916-'17, 11.55 cents.

As shown in Table I the extremely low or the extremely high margins during the year generally do not come within the first six months' marketing period when the major portion of the wheat crop is sold by the farmers. On the other hand, they come after the period of heavy primary movement of wheat, when conditions affecting the terminal market price and those affecting the local price may be somewhat different. On an average from month to month, departures from the customary margin on which elevators in any section are attempting to buy would seem most likely to occur during seasons of light movement. They would therefore apply to a smaller part of the crop. Attempted buying margins, therefore, are indicative of the margin on which a large part of the crop is bought, though at times there are wide departures from this customary margin.

TABLE I.—AVERAGE YEARLY MARGIN, RANGE BETWEEN MONTHS, AND AVERAGE MONTHLY MARGINS NO. 1 NORTHERN WHEAT.

Federal Trade Commission data (*a*).

	1912-'13.	1913-'14.	1914-'15.	1915-'16.	1916-'17.	1912-'16.
Average for year	4.64	3.24	5.99	5.50	11.55	.....
Range of margins during yr.	3.48-7.17	1.91-4.72	3.49-7.56	4.65-17.69	5.55-36.64	4.32-8.51
September	4.96	2.36	6.06	5.69	6.55	4.68
October	5.47	3.67	5.34	6.36	5.55	5.34
November	4.93	3.37	5.07	4.96	6.48	4.65
December	4.35	2.83	5.76	5.06	7.85	4.68
January	4.81	3.27	6.69	5.50	12.09	5.23
February	4.35	4.08	7.50	4.77	12.18	5.04

(*a*) Report of the Federal Trade Commission on The Grain Trade, Vol. I, Country Grain Marketing, Sept. 15, 1920. (Appendix table 16, p. 348.)

HOW ACTUAL BUYING MARGINS ARE AFFECTED DURING SHORT PERIODS BY TERMINAL MARKET FLUCTUATIONS

It is noticeable in the Federal Trade Commission data and also in somewhat similar data being collected by the Kansas Agricultural Experiment Station that the widest departures from a 5- or 6-cent buying margin tend to come with radical swings upward or down-

ward in the terminal market price when the latter fluctuates violently.

As an instance during the violent price changes in the fall and winter of 1924 and the spring of 1925, margins reported by a group of elevators in southwestern Kansas varied from 3 cents a bushel December 1, 1924, to 16 cents, January 1, 1925, when the market was rising. The margin settled back to 8 cents by February 1, then with a March and April decline at the terminal market the margin again widened to 11 cents, March 1. With a rising market in May the margin changed from 7 1/2 cents April 1 to 18 cents May 1, and then back to 1 cent by June 1.

Another group of Kansas elevators in south central Kansas reported a 6-cent margin, December 1, 1924; an 8-cent margin, January 1, 1925; a margin of 9 cents, February 1; 8 cents, March 1; 8½ cents, April 1: 12 cents, May 1; and 5 cents, June 1. These margins are the price spread between the local price and the Kansas City average for No. 2 Hard Winter wheat.

Margins thus determined for the two groups of elevators just referred to and for a third group in west central Kansas are shown in figure 2. (See, also, figure 3.)

It is evident from these examples that part of the margin taken from the farmer from time to time is due to extreme fluctuations in central market prices and is a deduction to cover risk. Risk of price fluctuations at central markets appears to be an important element in the price paid for local elevator service.

HEDGING BY COUNTRY ELEVATORS IN ORDER TO REDUCE RISKS FROM PRICE FLUCTUATIONS AT TERMINAL MARKETS

"If the price paid for local elevator service is influenced considerably by price fluctuations at central markets, why not eliminate this risk by hedging?" is the first question asked.

While this whole subject carries a highly controversial aspect, there are certain facts about it that can be determined. In the first place the records secured from Kansas elevators show that as a matter of fact comparatively few elevators in this state do hedge, according to the generally accepted meaning of the word. They do not as a rule sell "futures" against their cash grain purchases. Some elevators that report making use of the hedge state that they use it "some." By this they mean that sometimes they hedge and sometimes they do not. Hedging of grain by Kansas elevators is more common where they must carry the grain on hand for a considerable period.

It is necessary to understand the conditions under which Kansas

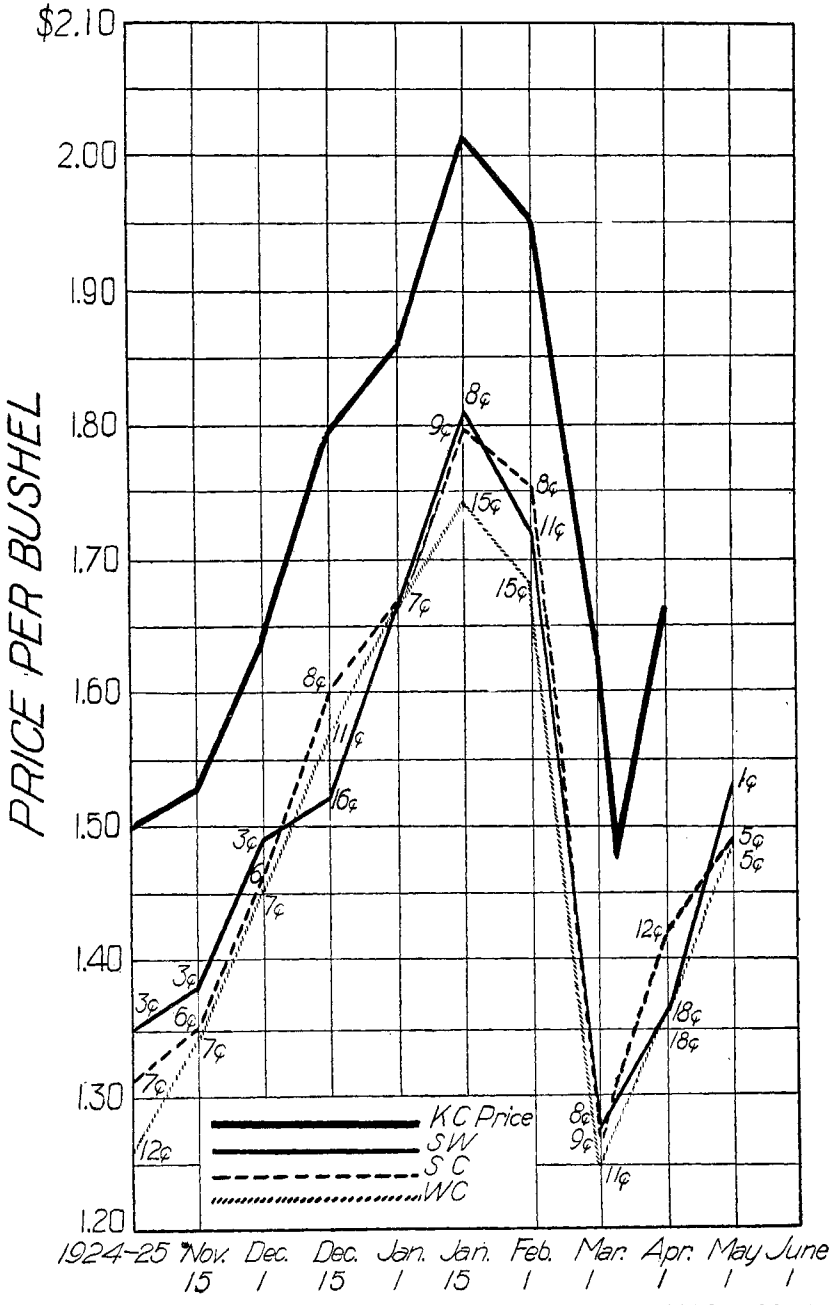

FIG. 2.—Fluctuations in Kansas City wheat prices (average of high and low) compared with local price fluctuations in west central Kansas, south central Kansas, and southwestern Kansas, showing variation in local buying margins after adjustment for freight rates.

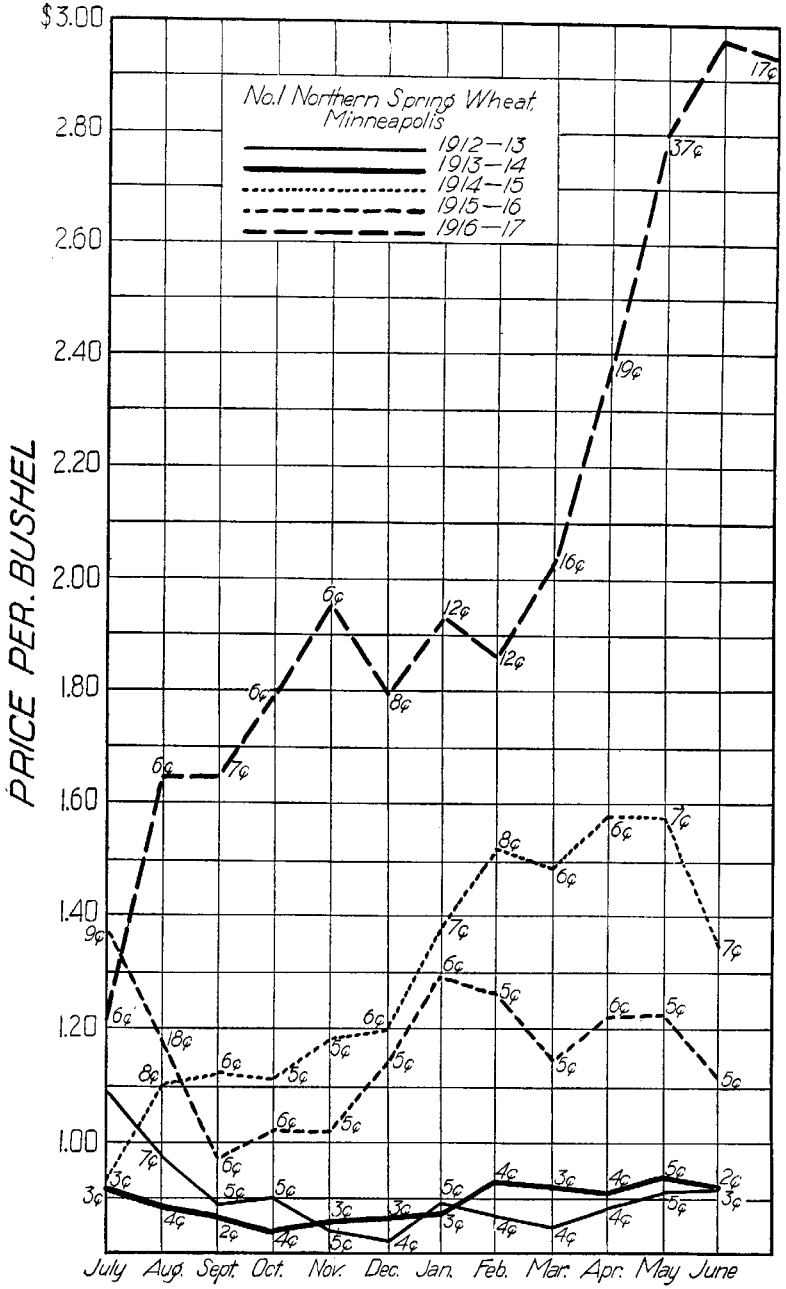

FIG. 3.—Fluctuating buying margins at various price levels over a period of years as shown by Federal Trade Commission data. (Prices from U. S. D. A. Yearbook 1925, p. 765.)

elevators operate before attempting to criticize the prevailing practice. The situation can perhaps best be pictured by contrasting wheat marketing conditions in Kansas City market territory with those prevailing in the Northwest in Minneapolis territory.

A study of the per cent distribution of farm marketings of wheat compared with the per cent distribution of Kansas City receipts shows a close adjustment of the two. (Table II.)

TABLE II.—DIFFERENCE BETWEEN CUMULATIVE PER CENT DISTRIBUTION OF FARM MARKETINGS AND KANSAS CITY RECEIPTS OF WHEAT.

Federal Trade Commission data (*a*).

July	—1.81	January	+ .68
August	—4.13	February	+ .78
September	—2.40	March	+1.70
October	+ .94	April	+1.75
November	— .03	May	+ .62
December	+ .32	June	

(+) Country marketing in excess of terminal receipts.
(—) Country marketing less than terminal receipts.
(*a*) Report of the Federal Trade Commission on the Grain Trade, Vol. VI, Prices of Grain and Grain Futures, September 10, 1924. (Page 86, table 25, column 7.)

In a few words this means that the per cent of total annual marketings that farmers have marketed up to a certain date differs but 1or 2 per cent from the per cent. of total annual receipts received by the Kansas City market up to the same date. The flow of grain from farms into local elevators is at about the same rate as the flow from local elevators into the Kansas City market.

If a similar comparison is made for the Minneapolis market, it will be found that average farm marketings and Minneapolis receipts do not match so closely in their seasonal distribution. (Table III.)

TABLE III.—DIFFERENCE BETWEEN CUMULATIVE PER CENT DISTRIBUTION OF FARM MAKETINGS AND MINNEAPOLIS RECEIPTS OF WHEAT.

Federal Trade Commission data (*a*).

July	+ 9.22	January	+11.10
August	+16.88	February	+ 9.05
September	+18.58	March	+ 5.10
October	+18.25	April	+ 3.68
November	+16.91	May	+ 2.26
December	+12.62	June	

(+) Country marketing in excess of terminal receipts.
(—) Country marketing less than terminal receipts.
(*a*) Report of the Federal Trade Commission on the Grain Trade, Vol. VI, Prices of Grain and Grain Futures, September 10, 1924. (Page 86, table 25, column 6.)

In the case of the Minneapolis market the per cent of total annual marketings that farmers have marketed up to any certain date is larger than the per cent of total annual receipts received by the Minneapolis market up to the same date by from 2 to 18 or 19 per cent, depending upon the season of the year. The average rate of delivery from the farm to local elevators is much in excess of the rate of flow from country elevators to the Minneapolis terminal, indicating among other things more reliance upon country elevator storage in this area than in Kansas City territory.

Since Kansas elevators on the whole average only about 15,000 bushels storage capacity and store but little grain for any length of time, the question of economy in hedging stored grain will have little bearing on local elevator hedging practice.

The whole question then resolves itself into one of whether Kansas elevator men are following inefficient, and costly methods in not hedging in the futures market their purchases of grain from farmers. The value of hedging in general or its protective features in the case of stored grain is not, therefore, the point at issue. The question is merely this, Would it pay Kansas elevator men to follow more generally the practice of hedging grain purchases by selling the future against it?

Aside from the fact that experience has not convinced a large majority of operators of the economy of such a practice, there are additional facts to consider.

In the first place, as pointed out above (page 12), with elevators doing little or no storage business, wheat is shipped out during the heavy marketing season almost as fast as it is bought. During most years elevators have on the average shipped out 70 to 75 per cent of the year's business by the end of January. This is indicated in Table IV and also by reports of carlot shipments by 170 elevators as an average for the years 1920 to 1925. These latter reports showed 75 per cent of the year's shipment moved from the elevators by the end of January.

Not only have farmers sold and elevator men bought about 70 to 75 per cent of the crop in the first six or seven months of the crop year, but elevator men in turn have shipped about that amount. Not only does the Kansas elevator man hedge purchases from farmers by "on track" and "to arrive" sales, but he also in a way hedges consignments by almost equal new purchases of grain from farmers. If the market goes down and he loses on the consignment, he buys from the farmers on a lower market, and has another consignment

TABLE IV.—SHIPMENTS OF WHEAT FROM KANSAS COUNTRY ELEVATORS BY WEEKS.

Data for 1921-'22.

Week No.	WEEK.	Number of cars.	Bushels unloaded.	Per cent of total.	Cumulative per cent.
1	5-1 to 5-6				
2	5-8 to 5-13				
3	5-15 to 5-20	1	1,253		
4	5-22 to 5-27				
5	5-29 to 6-3	6	7,723		
6	6-5 to 6-10	5	6,570		
7	6-12 to 6-17	17	22,749		
8	6-19 to 6-24	23	30,272		
9	6-26 to 7-1	36	47,477		
10	7-3 to 7-8	109	145,433	2.7	2.7
11	7-10 to 7-15	81	109,105	2.0	4.7
12	7-17 to 7-22	174	251,171	4.7	9.4
13	7-24 to 7-29	148	217,854	4.1	13.5
14	7-31 to 8-5	131	187,200	3.5	17.0
15	8-7 to 8-11	148	172,114	3.2	20.2
16	8-14 to 8-19	122	172,638	3.2	23.4
17	8-21 to 8-26	98	151,972	2.8	26.2
18	8-28 to 9-2	104	159,787	3.0	29.2
19	9- 4 to 9-9	110	163,981	3.1	32.3
20	9-11 to 9-16	97	142,098	2.7	35.0
21	9-18 to 9-23	111	163,162	3.0	38.0
22	9-25 to 9-30	64	94,065	1.8	39.8
23	10-2 to 10-7	58	77,809	1.4	41.2
24	10-9 to 10-14	49	65,618	1.2	42.4
25	10-16 to 10-21	46	65,074	1.2	43.6
26	10-23 to 10-28	54	75,377	1.4	45.0
27	10-30 to 11-4	57	77,678	1.4	46.4
28	11-6 to 11-11	63	89,406	1.7	48.1
29	11-13 to 11-18	70	100,119	1.9	50.0
30	11-20 to 11-25	79	116,232	2.2	52.2
31	11-27 to 12-2	121	171,349	3.2	58.4
32	12-4 to 12-9	157	225,644	4.2	59.6
33	12-11 to 12-16	144	204,411	3.8	63.4
34	12-18 to 12-23	129	187,641	3.5	66.9
35	12-25 to 12-30	122	171,549	3.2	70.1

TABLE IV—CONCLUDED.

Week No.	WEEK.	Number of cars.	Bushels unloaded.	Per cent of total.	Cumulative per cent.
36	1-1 to 1-6	73	105,471	2.0	72.1
37	1-8 to 1-13	68	100,671	1.9	74.0
38	1-15 to 1-20	44	62,506	1.2	75.2
39	1-22 to 1-27	41	54,857	1.0	76.2
40	1-29 to 2-3	22	31,399	.6	76.8
41	2-5 to 2-10	44	63,242	1.2	78.0
42	2-12 to 2-17	83	114,754	2.1	80.1
43	2-19 to 2-24	50	67,665	1.2	81.3
44	2-26 to 3-3	35	50,273	.9	82.2
45	3- 5 to 3-10	26	32,812	.6	82.8
46	3-12 to 3-17	36	48,066	.9	83.7
47	3-19 to 3-24	57	74,055	1.4	85.1
48	3-26 to 3-31	74	101,744	1.9	87.0
49	4- 2 to 4-7	26	34,923	.7	87.7
50	4-9 to 4-14	74	99,842	1.9	89.6
51	4-16 to 4-21	45	62,589	1.2	90.8
52	4-23 to 4-28	57	79,817	1.5	92.3
53	4-30 to 5-5	30	41,414	.8	93.1
54	5-7 to 5-12	27	35,795	.7	93.8
55	5-14 to 5-19	31	37,858	.7	94.5
56	5-21 to 5-26	20	24,899	.5	95.0
57	5-28 to 6-2	34	45,104	.8	95.8
58	6- 4 to 6-9	20	25,009	.5	96.3
59	6-11 to 6-16	48	58,393	1.1	97.4
60	6-18 to 6-23	60	78,033	1.4	98.8
61	6-25 to 6-30	52	65,414	1.2	100.0

ready for a market higher than that on which he bought. Only on a continuously declining market is he likely to sustain heavy losses.

Table V shows for a five-year prewar period the seesaw character of day-to-day price fluctuations of cash wheat. It is not hard to see from this that with purchases and shipments fairly well distributed over this period there would be about as close an averaging out of gains and losses due to market fluctuations as the average country elevator man would be able to effect through hedging in the futures market. Such a scattering of risks, where the machinery for moving grain permits it, as it usually does in Kansas if there is ample car supply, is a well-established way of reducing risk.

TABLE V.—NUMBER OF DAYS OF ADVANCING AND OF DECLINING PRICES WITHIN THE MONTH AND THE TOTAL ADVANCE AND DECLINE IN CENTS PER BUSHEL DURING THE MONTH. JULY TO JANUARY, 1910 TO 1914, INCLUSIVE.

MONTH	1910.				1911.				1912.				1913.				1914.			
	Up.		Down.		Up.		Down.		Up.		Down.		Up.		Down.		Up.		Down.	
	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.	Days.	Cents.
July	10	15	14	13	14	11	10	11	12	23½	14	44	12	3½	13	9½	14	17½	12	26
August	14	7½	13	9	17	15	10	8	12	8¼	14	11¼	16	6½	10	5	17	45	8	18½
September	16	6½	9	7	13	24½	12	10½	11	7¾	13	10¾	12	8½	13	5	7	16½	18	27
October	6	5½	19	13½	12	17½	13	16½	12	21	14	15	16	3½	10	5½	19	16	7	7
November	14	20	10	16	14	14½	10	18½	10	19	13	25	11	2½	13	3½	14	7½	9	8
December	17	17	9	15½	14	15	10	18	14	27	11	24	18	3	8	2½	19	17	7	3
January	13	19	12	19½	13	17½	13	13½	18	15	8	6	8	3	18	3	20	29½	5	6½
Totals	90	90½	86	93½	97	115	78	96	89	121½	87	136	93	30½	85	34	110	149	66	96
Grand total (1910-'14, inc.)																	479	$5.06½	402	$4.55½

There is some question, therefore, whether under Kansas conditions any great saving could be effected through a wider use of hedging in the futures market against country purchases. Certainly there is question as to whether the saving would be large enough to contribute anything to the country elevator's ability to buy on a smaller margin.

HOW ACTUAL BUYING MARGINS ARE AFFECTED BY LOCAL CROP CONDITIONS AND LOCAL COMPETITION

A study of the costs involved in local elevator operation, as pointed out in the latter part of this bulletin, shows volume of grain handled to be the most important factor in determining costs per bushel of handling grain. As a matter of fact in much of Kansas the volume of grain production varies to a greater extent than it is possible for total cost of elevator operation to vary. This is indicated in a general way for the state as a whole by the fact that, during the three-year period studied, average elevator volume has varied from the three-year average from 13.2 per cent below to 18 per cent above the average. Average costs per elevator have varied from their three-year average from 8.4 per cent below to 12.2 per cent above. This, too, included the period 1920-'21, when costs would naturally show maximum reduction.

Since cost per bushel of handling wheat is determined by dividing total bushels handled into total elevator costs for grain handling, if the bushelage, or number divided by, fluctuates more widely than total elevator costs, or the number divided into, then cost per bushel of handling grain is determined to a greater degree by factors affecting bushelage than by any elements entering into total elevator operating costs. This makes risk arising from possible fluctuations in size of the wheat crop the most important primary cause affecting cost per bushel of handling wheat at local elevators. While cost does not alone determine the size of the local margin it must in the long run have some effect on margins if elevators are to remain solvent. The uncertainty as to volume of business due to large fluctuations in the wheat crop in Kansas, therefore, enters into size of margin taken by the local elevator.

Something of the extent of this risk over a period of years is pictured by the fluctuation in size of Kansas wheat crop per elevator in the state. In 1919 the average was 81,000 bushels; in 1920, 78,000 bushels; in 1921, 51,000 bushels; in 1922, 65,000 bushels; in 1923, 42,000 bushels; in 1924, 85,000 bushels; in 1925, 41,000 bushels; and in 1926, 86,000 bushels per elevator. This, of course, does not tell

the whole story, as the fluctuation in certain individual counties or around certain shipping points is even greater than an average for the whole state. It does indicate, however, that during the period included in this study, 1920 to 1922, inclusive, volume per elevator was more stable than it ordinarily is over a period of years.

The extent of local competition is another factor external to items of cost in local elevator operation that affects the size of the margin taken by the local elevator. This is reflected in a better price paid to the producer where competition is active. (Fig. 1.) It appears as if the character of the local competition, especially whether mill competition is involved, has a considerable effect on the size of the local margin.

Another local situation that frequently affects the size of the local margin is the premium quality of wheat in certain sections. The fact that the local elevator man can get an extra premium at the central market for this special quality wheat without paying for the full quality differential, enables him to bid up the local price so as to apparently narrow the local margin; whereas, in fact, the local margin may not be narrowed because of the extra price received at the central market.

THE RISK ELEMENTS IN LOCAL ELEVATOR MARGINS

From what has been said up to this point it must be evident that the price paid for local elevator service by the farmer is affected by fluctuations in terminal market prices, by local crop conditions and the consequent, effect on volume to be handled, by local competition, and by certain local conditions that may affect salability of the wheat on central markets.

It is not surprising, therefore, that some investigators of local elevator costs have already reached the conclusion that "In ordinary years, margins and expenses seem to be fairly well adjusted to each other, and leave a fairly regular net profit; however, there is a good deal of the accidental in this after all, for margins vary greatly from year to year for different kinds of grain."[7]

Before attempting to analyze local elevator operating cost into the elements of expense most generally recognized, it, is well to consider the additional burden of risk which in some way or other must be taken into account in the local elevator buying margin,

Important factors involved in the determination of the local elevator buying margin are as follows: (1)Bushels handled per ele-

7. John D. Black and H. Bruce Price. Costs and Margins in Marketing, Publication 1868 The Annals of the American Academy of Political and Social Science, Jan., 1926.

vator; (2) competition; (3) price fluctuations at central markets; (4) premium possibilities of wheat; and (5) cost of operation per elevator. Another factor, size of crop, and its effect on the number of bushels handled per elevator also factors two, three, and four have just been discussed. The remainder of this bulletin will be given over largely to a discussion of the cost of operation per elevator. After a discussion of this factor, the extent to which it justifies the local margin, and the relation of this factor to local elevator profit per bushel, an effort will be made to point out the lines along which any efforts at reducing the local elevator margin can be most profitably directed.

COSTS OF LOCAL ELEVATOR OPERATION

The costs of operating a local elevator are of two kinds—fixed costs and variable costs. Fixed costs are costs that remain more or less constant whether the volume of grain handled is large or small. A small volume of grain handled, therefore, runs the cost per bushel up very rapidly in the case of these costs. Similarly a large volume runs the per-bushel cost down rapidly. With reference to these costs, therefore, it is largely volume handled that causes cost per bushel to run high or low.

Variable costs are those that vary or change somewhat in proportion, though not always in exact proportion, with changes in volume of grain handled. With reference to these costs, therefore, volume handled has little influence on cost per bushel.

In the case of a group of elevators, the fixed cost per bushel of grain handled is obviously subject largely to the outside influences determining volume of grain. The elevators' variable cost per bushel is determined to a much greater extent by the size of the expense items that go to make up variable costs independent of the volume handled. The effect of volume of grain handled on fixed and variable costs is shown in figure 4. As volume handled increases, fixed cost per bushel decreases; variable cost per bushel shows little change. Figure 4 indicates that for the group of elevators included in the 1921-'22 study, an increase of 25,000 bushels in volume would mean on the average a lowering of fixed operating cost by a fraction more than 0.5 of a cent per bushel. At the same time, variable costs would be lowered less than 0.1 of a cent per bushel, giving a total reduction in operating costs of 0.6 of a cent per bushel. The 1922-'23 data give practically the same figure, 0.6 of a cent per bushel. The items composing fixed costs, before including interest and shrinkage, represented on the average 71.6 per

cent of the total operating costs per bushel in 1921 (Table VI, Fig. 5), and 76 per cent in 1922 (Table VI). In turn, salaries and "building and equipment" costs represented 73.8 per cent and 22.5 per cent, respectively, of the total fixed costs (Table VII). In brief, the total cost per bushel of operating these local elevators is made up of about 70 to 75 per cent fixed costs, and these fixed costs are more than 96 per cent expenses for salaries, buildings, and equipment.

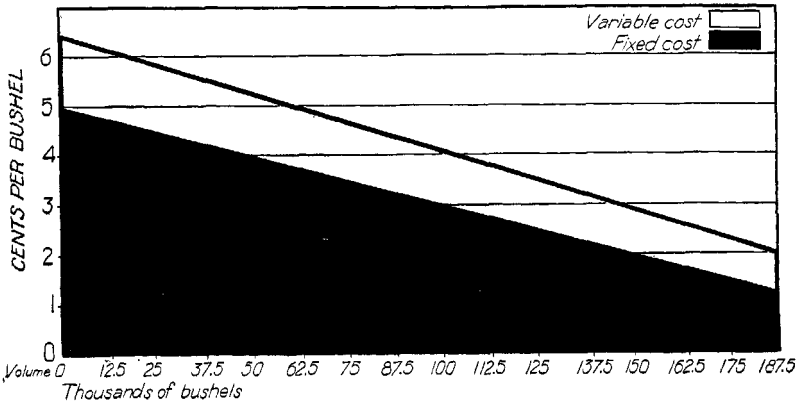

FIG. 4.—Total elevator operating costs showing influence of volume on variable and fixed costs.

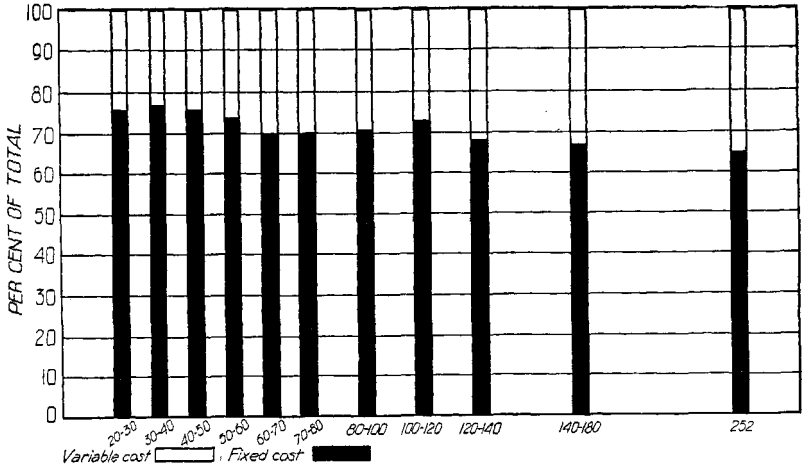

FIG. 5.—Total elevator operating costs showing per cent distribution of fixed and variable costs (1921) for groups of elevators handling different volumes of business. (Volumes expressed in thousands of bushels.)

TABLE VI.—COMPARISON OF FIXED AND VARIABLE OPERATING COSTS IN CENTS PER BUSHEL AND PER CENT OF TOTAL OPERATING COSTS REPRESENTED BY FIXED AND BY VARIABLE COSTS FOR SPECIFIED TYPES OF ELEVATORS, 1921 AND 1922.

Number of elevators.	Type of Elevator.	Average number of bushels handled.	Operating costs.			Per cent of total operating costs represented by—	
			Total (a).	Fixed.	Variable.	Fixed costs.	Variable costs.
1921 Data.							
29	Mill line	52,224	4.57	3.39	1.18	74.2	25.8
13	Commercial line	73,761	5.22	3.57	1.65	68.4	31.6
11	Coöperative line	109,652	3.40	2.44	.96	71.8	28.2
4	Coöperative (Independent)	150,307	3.14	2.13	1.01	67.8	32.2
2	Commercial (Independent)	94,178	3.30	2.59	.71	78.5	21.5
59	All types	77,223	4.16	2.98	1.18	71.6	28.4
15	All coöperatives	120,500	3.32	2.34	.98	70.5	29.5
44	All other	62,471	4.71	3.40	1.31	72.2	27.8
30	All (excluding mill line)	98,489	3.93	2.75	1.18	70.0	30.0

TABLE VI.—*Concluded.*

Number of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Operating costs.			Per cent of total operating costs represented by—	
			Total (a).	Fixed.	Variable.	Fixed costs.	Variable costs.
1922 Data.							
74	Mill line	46,739	5.46	4.49	.97	82	18
39	Commercial line	56,701	5.55	4.22	1.33	76	24
21	Coöperative line	53,586	5.02	3.74	1.28	74	26
49	Coöperative (Independent)	121,074	3.55	2.53	1.02	71	29
6	Commercial (Independent)	93,424	3.86	3.19	.67	83	17
189	All elevators	70,310	4.52	3.45	1.07	76	24

(a) Interest and shrinkage not included.

It is obvious, therefore, that about three-fourths of the per-bushel cost of handling grain is affected very largely by fluctuating volume, which in turn is dependent to a large degree upon crop conditions, weather, and other more or less accidental circumstances. In the next place, fixed cost per bushel depends nearly 75 per cent upon salaries and wages paid. (Tables VII and VIII.) Reduction of fixed cost aside from the influence of volume of grain handled is, therefore, largely dependent upon ability to cut salaries and wages. The opportunity that one elevator has over another in this respect is very limited.

A study of the differences in operating costs between elevators having almost identically the same volume of business[8] shows that half or more of the differences in cost per bushel is due to differences in salary and wage cost.

On the average, differences in operating costs per bushel between elevators doing the same volume of business were found to be accounted for as follows:

50.4 per cent by difference in management and labor costs.[9]
12.0 per cent by difference in taxes.
6.6 per cent by difference in repairs, power, and light cost.
16.7 per cent by difference in depreciation costs.
14.3 per cent by differences in miscellaneous operating expense; miscellaneous office and general administration expense; and insurance.

It is obvious that difference in taxes is an item of cost not within the control of the management to any great extent. Once buildings are erected or purchased depreciation costs can be only moderately affected by the management.

Miscellaneous operating expenses and frequently general office and administration expenses increase because of equipment to save labor. One could hardly expect to eliminate all of the 14.3 per cent difference in miscellaneous costs without to some extent increasing the difference in management and labor costs.

Difference in management and labor cost per bushel of grain handled, therefore, seems to offer the greatest opportunity for any extensive and general reduction in operating costs such as would be necessary to bring about a permanent lowering of buying margins.

While as between elevators there is considerable variation in fixed costs, the variation is not so great as the variation in volume.

8. For method of comparisons see page 26. The same array of elevators was used in both instances.

9. The 50.4 per cent difference due to difference in management and labor costs compares with 56 per cent obtained by Metzger on 50 Minnesota elevators by the method of multiple correlation as reported at the meetings of the American Institute of Coöperation at the University of Minnesota, July, 1926.

TABLE VII.—COMPARISON OF THE IMPORTANT ITEMS COMPOSING FIXED OPERATING COSTS IN CENTS PER BUSHEL OF SPECIFIED TYPES OF ELEVATORS, 1921.

Number of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Total fixed operating costs (*a*).	Items of fixed operating costs.							
				Salaries.		Elevator building and fixed equipment cost (*b*).		Office building furniture and fixture cost.		Other fixed costs.	
				Per bu.	Per cent.	Per bu.	Per cent.	Per bu.	Per cent.	Per bu.	Per cent.
29	Mill line	55,224	3.39	2.58	76.1	0.71	20.9	0.07	2.1	0.03	.9
13	Commercial line	73,761	3.57	2.70	75.6	.68	19.1	.08	2.2	.11	3.1
11	Coöperative line	109,652	2.44	1.71	70.1	.48	19.6	.08	3.3	.17	7.0
4	Coöperative independent	150,307	2.13	1.36	63.9	.47	22.1	.05	2.3	.25	11.7
2	Commercial independent	94,178	2.59	2.04	78.7	.50	19.3	.03	1.2	.02	.8
59	All types	77,223	2.98	2.20	73.8	.60	20.1	.07	2.4	.11	4.7
15	All coöperatives	120,500	2.34	1.59	68.0	.48	20.5	.07	3.0	.20	8.5
44	All other	62,471	3.40	2.59	76.2	.70	20.6	.07	2.0	.04	1.2
30	All (excluding mill line)	98,489	2.75	1.99	72.4	.58	21.1	.07	2.5	.11	4.0

(*a*) Does not include interest and shrinkage.
(*b*) Does not include current repairs.

TABLE VIII.—AVERAGE FIXED OPERATING COST PER BUSHEL BY SPECIFIED TYPES OF ELEVATORS, 1922.

In cents per bushel.

Number of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Total fixed operating costs (a).	Items of fixed operating costs.					
				Salaries.		Elevator building and fixed equipment costs.		Other fixed costs.	
				Per bu.	Per cent.	Per bu.	Per cent.	Per bu.	Per cent.
74	Mill line	46,739	4.49	3.31	74	1.06	23	.12	3
39	Commercial line	56,701	4.22	3.24	77	.83	19	.15	4
21	Coöperative line	53,586	3.74	2.51	67	1.11	30	.12	3
49	Coöperative independent	121,074	2.53	1.89	75	.59	23	.05	2
6	Commercial independent	93,424	3.19	2.45	77	.70	22	.04	1
189	All elevators	70,310	3.45	2.56	74	.80	23	.09	3

(a) Interest and shrinkage not included.

(Fig. 5.) This inability to reduce fixed costs in the same ratio that volume is reduced results in low volume elevators having a higher fixed cost per bushel of grain handled as shown in figure 4.

The opportunities elevators have of reducing fixed costs is perhaps best indicated by comparing the salary and labor cost per bushel of handling grain for elevators handling about the same number of bushels of grain.

The fact is frequently observed that within a certain size group of elevators—for instance, elevators with an annual volume of business of 100,000 to 125,000 bushels—there is a wide range in total cost per bushel, say from 3 to 9 cents per bushel. This fact in itself is sometimes taken as *prima facie* evidence that there must be a great opportunity for better economy in organization and management of local elevators in general.

This proposition needs further analysis, however, especially if it is to be considered a part of a practical program of improvement where its importance must be measured relative to other possible lines of betterment.

As an example the 1922 data, which offer the greatest variety, were analyzed as follows in order to judge of the possible economies to be effected in reduced salary and wage costs, which make up by far the greater part of overhead costs.

Elevators were arrayed by types, according to volume, from low to high. Then adjacent elevator records were paired so as to throw together elevators of nearly identically the same volume of business. Next the difference in salary and labor costs per bushel for each pair was found. Any elevator with an odd bushelage not pairing well with another was left out. Out of 189 elevator records, 136 were used in the manner stated. Differences in cents per bushel were then shown in a frequency table as indicated in Table IX.

Several facts that are not readily disclosed by an inspection of ranges in cost within different size groups, that allow as much as 10,000 to 25,000 bushel intervals between individual elevators, are brought out by such an analysis as that described.

Extremely small or extremely large differences in salary and wage cost per bushel, between elevators handling the same volume of grain, are confined very largely to the mill-line type of elevator.

Several things account for these unusual differences. In the first place the accounting difficulties in equitably distributing the grain department overhead expense over the several units of the line may account for some of the erratic variations. Secondly, the mere fact

TABLE IX.—DIFFERENCES IN SALARY AND WAGE COST PER BUSHEL OF WHEAT HANDLED BY ELEVATORS HAVING ALMOST IDENTICALLY THE SAME VOLUME OF BUSINESS.

Data for 1922-'23.

Difference in cents per bushel	Less than 0.1	.1 to .3	.3 to .5	.5 to .7	.7 to .9	.9 to 1.1	1.1 to 1.3	1.3 to 1.5	More than 1.5
		.19 M							
		.21 M							
		.15 M							
		.20 M		.54 M					
		.19 M		.56 M					1.70 M
		.28 I		.63 M					3.00 M
		.18 I		.70 M					1.71 M
		.29 I	.36 M	.52 M					1.65 M
		.12 I	.46 M	.59 I					2.24 M
		.19 I	.48 M	.51 I					2.65 M
	.06 M	.11 CI	.43 I	.69 CI					4.15 M
	.06 M	.22 CI	.31 CI	.58 CI		.96 I			6.11 M
	.01 M	.17 CI	.39 CI	.57 CI		1.04 M			1.74 I
	.05 M	.27 CI	.45 CI	.54 CI	.75 M	.95 I		1.38 M	1.98 I
	.09 M	.30 CI	.38 CI	.59 CL	.79 CI	1.04 CL	1.18 CI	1.46 I	2.44 I
	.09 M		.45 CL	.65 CL	.81 CL	1.07 CL	1.27 CL	1.41 CI	1.60 CI
Number	6	15	9	13	3	5	2	3	12
Total	(less than 0.1 to 0.7)			43	(0.7 to 1.5)			13	12
Per cent	(less than 0.1 to 0.7)			63.2	(0.7 to 1.5)			19.1	17.7

Note.—Different types of elevators are indicated as follows: M, Mill; I, Independent; CI, Coöperative Independent; and CL, Coöperative-line.

TABLE X.—DATA FOR THE HALF OF THE ELEVATORS IN TABLE IX FALLING IN THE LARGER-VOLUME GROUPS.

Difference in cents per bushel	Less than 0.1	.1 to .3	.3 to .5	.5 to .7	.7 to .9	.9 to 1.1	1.1 to 1.3	1.3 to 1.5	More than 1.5
		.19							
		.21							
		.15							
		.20							
		.28		.54					
		.18		.56					
		.29	.36	.63					
		.11	.46	.59					
	.06	.22	.43	.51		1.04			
	.06	.17	.31	.69	.79	.95			1.70
	.01	.27	.39	.59	.81	1.04	1.27		3.00
Number	3	11	5	7	2	3	1	0	2
Total	(less than 0.1 to 0.7)			26	(0.7 to 1.5)			6	2
Per cent	(less than 0.1 to 0.7)			76.4	(0.7 to 1.5)			17.7	5.9

of a mill elevator in one section being able to close down in the face of a light crop while owing to competition another has to stay open even for a small volume of business accounts for wide fluctuations. Furthermore, there is a vast difference in the ability of mills to pay for wheat, due to their difference in size, extent of market for their flour, trade connections, their position to take advantage of milling-in-transit rates, and the like.

A study of the data in Table IX also reveals the fact that many of the larger differences shown occur in the smaller volume groups. Local conditions make it very difficult to keep salary and labor costs at different stations within several hundred dollars of each other though more or less accidentally they do handle the same volume. There is no certainty ahead of time as to the exact volume that either elevator will handle. The few hundred dollars difference in salary and labor costs makes little difference per bushel in the higher volume groups, but considerable difference per bushel in the lower volume groups.

Some indication of the way this works can be given by taking the elevators of each type that fall in the upper half of each group with respect to volume handled. Differences in salary and labor cost per bushel for these elevators in the upper volume group may then be arranged as in Table IX, giving Table X.

Considering the problem from all angles it appears that while there are some cases in which difference in cost may warrant hope of greater efficiency on the part of the high-cost elevator, this is the exception rather than the rule. A program of reduced elevator costs has more to offer these high-cost elevators, individually, than it can contribute to any general reduction of buying margins in local grain marketing.

On the other hand it seems that in Kansas local elevator operation is so standardized and competition so keen that relatively few concerns can long survive if they get far out of line with respect to costs within their control. And accidental factors eliminate many.

SIDELINE AND NONSIDELINE ELEVATORS

Since, with but few exceptions, one elevator has little advantage over another in the wages it must pay for labor and management or in the salary and labor cost per bushel of grain handled except as that is affected by volume of business, the principal advantage to be gained through cost reduction, if any, comes from the better utilization of the time of management and labor. The adoption of

sidelines to the grain business is sometimes looked to as a means of accomplishing this result. Of the 59 elevators on which complete records were obtained in 1921-'22, 45 or about 76 per cent handled some sidelines. In 1922-'23, 53 per cent handled sidelines.

In general, sideline elevators made about as much net profit from sidelines as from grain in 1921, but not in 1922. (Tables XI, XII, XIII, XIV, and XV.) On the other hand, it will be noted that commercial and mill-line elevators in the nonsideline groups made more net profit or smaller loss than the same types in the sideline group. The one coöperative independent in 1922 carrying no sidelines made a bigger profit than the average of the coöperatives with sidelines, but this single instance cannot be taken as sufficient evidence either way.

No final conclusions can be drawn from such limited data on sideline operations. Nevertheless, the information obtained suggests that in the case of single-unit elevators where relatively high-priced management and labor must be maintained whatever the volume of grain business, the inclusion of sidelines may be profitable. The chief source of loss in such cases is likely to come from doing an extensive credit business.

In the case of line companies where local station management and labor costs can be more readily adjusted to fluctuating volume of

TABLE XI.—ANALYSIS OF THE BUSINESS OF SIDELINE GROUP OF ELEVATORS, 1921.

Number of elevators	22	6	11	4	2
TYPE OF ELEVATOR	Mill line.	Comm'l line.	Coöp. line.	Coöp. indp.	Comm'l indp.
Average sales of wheat	$56,384	$92,834	$118,023	$162,914	$104,696
Average sales of other grain	330	1,045	714	465	.....
Average sales of sidelines	1,824	7,366	16,146	16,889	9,856
Total	$58,538	$101,245	$134,883	$180,268	$114,552
Average gross profit on wheat:					
Gross trading profit	$1,418	$3,880	$2,934	$5,696	$3,526
Freight claims actually paid	75	.....	55	368	.....
Sales of screenings	.....	.....	88	87	48
Total	$1,493	$3,880	$2,997	$6,151	$3,574
Average profit on other grain	28	65	—4	30	.....
Average profit on sidelines	163	720	1,161	1,772	958
Total gross trading profit	$1,684	$4,665	$4,154	$7,953	$4,532
Operating cost allocated to grain (int. not included)	$2,520	$4,520	$3,729	$4,726	$3,108
Operating costs allocated to sidelines	126	291	586	620	496
Total operating cost (interest not included)	$2,646	$4,811	$4,315	$5,346	$3,604
Net operating profit on grain	—999	425	—36	1,455	468
Net operating profit on sidelines	27	429	575	1,152	464
Total net operating profit	—971	854	—161	2,607	932
Other income	4	12	52	514	.....
Total net income	—$967	$866	—$101	$3,121	$932

TABLE XII.—ANALYSIS OF THE BUSINESS OF NONSIDELINE GROUP OF ELEVATORS, 1921.

Number of elevators	7	7
TYPE OF ELEVATOR	Mill line.	Comm'l line.
Average sales of wheat	$70,496	$70,583
Average sales of other grain		773
Total	$70,496	$71,358
Average gross profit on wheat:		
Gross trading profit	$2,440	$4,720
Freight claims actually paid	36	2
Total	$2,476	$4,722
Average profit on other grain		67
Total gross trading profit	$2,476	$4,789
Operating cost (interest not included)	$2,844	$3,274
Average net operating profit	—368	1,515
Other income	7	
Total net income	$361	$1,515

grain and where much of the business management is directed from a central office, the inclusion of sidelines is more questionable. Some line companies adjust their local elevator labor costs by having their local buying done on a small salary plus commission, or on a straight commission basis. The line company, it would seem, can much better afford to concentrate on the grain-handling business.

TYPES OF ELEVATORS

Cooperative elevators have a rather distinct advantage when it comes to obtaining volume of grain. They may even be induced to carry certain sidelines more as an accommodation to patrons than for the profit in the enterprise. Since cooperatives usually average a larger volume of grain handled, they are in a position to lower operating costs through volume handled. (Fig. 4.)

The cooperative line, if organized on the county-unit basis, does not have all the additional advantages of other line-house types. General managers are located at county seats or central county points and are not in close personal contact with terminal marketing machinery and terminal buyers. Secondly, a mere county-wide distribution of elevators does not distribute the risk of low volume to the extent that a more widely scattered line of houses does. A cooperative line of the latter type seems the more desirable from an operating standpoint.

Independent single-unit elevators, especially where they have to compete with coöperatives and mills, usually average a lower volume handled than do the coöperatives. From this angle their costs

TABLE XIII.—ANALYSIS OF THE BUSINESS OF SIDELINE GROUP OF ELEVATORS, 1922.

	5	35	21	18	39	79
Number of elevators						
TYPE OF ELEVATOR	Comm'l line.	Mill line.	Coöp. line.	Coöp. indp.	All coöps.	All types.
Average sales of wheat	$60,638.20	$41,235.90	$38,008.39	$108,812.86	$69,072.00	$56,205.76
Average sales of other grain	2,554.40	325.03	1,161.53	9,962.38	10,608.77	5,542.57
Average sales of sidelines	8,743.00	2,582.08	8,923.17	15,529.85	11,972.41	7,607.74
Totals	$71,935.60	$44,143.01	$55,093.09	$134,305.09	$91,653.18	$69,356.07
Average gross trading profit:						
Wheat	$2,996.40	$1,515.49	$1,650.43	$5,485.08	$3,420.26	$2,549.55
Other grain	127.80	37.08	831.75	704.94	773.22	406.23
Totals	$3,124.20	$1,552.57	$2,482.18	$6,190.02	$4,193.48	$2,955.78
Sidelines	755.20	171.98	517.74	1,109.34	790.78	514.38
Totals	$3,879.40	$1,724.55	$2,999.92	$7,299.36	$4,984.26	$3,470.16
Average operating cost:						
Allocated to grain (interest not included)	$3,593.65	$2,351.21	$2,694.00	$4,297.99	$3,434.56	$2,964.66
Allocated to sidelines	448.91	182.12	673.46	756.69	711.86	460.59
Totals	$4,042.56	$2,533.33	$3,367.46	$5,054.68	$4,146.42	$3,425.25
Average net operating profit:						
Grain	—$469.45	—$798.04	—$211.82	$1,892.03	$758.92	$8.88
Sidelines	306.29	—10.14	—155.72	352.65	78.92	53.79
Totals	—$163.16	—$808.78	—$367.54	$2,244.68	$837.84	$44.91
Average other income			121.51	64.16	95.04	46.92
Average total net profit and income	—$163.16	—$808.78	—$246.03	$2,308.84	$932.88	$91.83
Average bushels handled	64,610	42,486	53,586	125,389	86,726	65,726

TABLE XIV.—ANALYSIS OF THE BUSINESS OF NONSIDELINE GROUP OF ELEVATORS, 1922.

Number of elevators	16	15	31	39	1	71
TYPE OF ELEVATOR	Comm'l line.	Comm'l line.	Total comm'l line.	Mill line.	Coöp. indp.	All types.
Average sales of wheat	$47,507.87	$52,663.34	$50,002.45	$49,984.06	$103,505.55	$50,745.92
Average sales of other grain	870.43	12,480.45	6,488.19	286.92	21,418.95	3,292.15
Totals	$48,378.30	$65,143.79	$56,490.64	$50,270.98	$124,924.50	$54,038.07
Average gross trading profit:						
Wheat	$2,648.70	(a)	(a)	$3,068.64	$5,471.97	(a)
Other grain	137.75	(a)	(a)	38.82	1,626.71	(a)
Totals	$2,786.45	$3,938.99	$3,344.13	$3,107.46	$7,098.68	$3,267.01
Operating cost (interest not included)	$2,638.65	$3,585.63	$3,097.19	$2,661.27	$3,201.91	$2,895.62
Net operating profit	147.80	353.36	246.94	446.19	3,896.77	371.39
Average other income						
Average total net profit and income	$147.80	$353.36	$246.94	$446.19	$3,896.77	$371.39
Average bushels handled	49,170	63,740	56,220	50,555	139,020	54,274

(a) Separate profit data unobtainable.

TABLE XV.—ANALYSIS OF THE BUSINESS OF ALL ELEVATORS STUDIED, 1922.

Number of elevators	36	74	21	19	40	150
TYPE OF ELEVATOR	Comm'l line.	Mill line.	Coöp. line.	Coöp. indp.	All coöps.	All types.
Average sales of wheat	$51,479.08	$45,822.10	$35,008.39	$108,533.54	$69,932.84	$53,621.30
Average sales of other grain	5,941.83	304.94	11,161.53	10,565.36	10,878.35	4,477.37
Total sales of grain	$57,420.91	$46,127.04	$46,179.92	$119,098.90	$80,811.19	$58,098.67
Average sales of sidelines	1,214.31	1,221.26	8,923.17	14,712.49	11,673.10	4,006.74
Totals	$58,635.22	$47,348.30	$55,093.09	$133,811.39	$92,484.29	$62,105.41
Average gross trading profit:						
Wheat	(a)	$2,334.04	$1,650.43	$5,484.39	$3,471.56	(a)
Other grain	(a)	38.00	831.75	753.45	794.56	(a)
Total grain	$3,313.58	$2,372.04	$2,482.18	$6,237.84	$4,266.12	$3,103.10
Sidelines	104.89	81.34	517.74	1,050.95	771.01	270.90
Totals	$3,418.47	$2,453.38	$2,999.92	$7,288.79	$5,037.13	$3,374.00
Average operating cost:						
Allocated to grain (interest not included)	$3,166.15	$2,549.55	$2,694.00	$4,240.82	$3,428.77	$2,931.98
Allocated to sidelines	62.35	86.21	673.46	716.87	694.08	242.58
Totals	$3,228.50	$2,635.76	$3,367.46	$4,957.69	$4,122.85	$3,174.56
Average net operating profit:						
Grain	$147.43	—$177.51	—$211.82	$1,997.02	$837.35	$171.12
Sidelines	42.54	—5.87	—155.72	334.08	76.93	28.32
Totals	$189.97	—$183.38	—$367.54	$2,331.10	$914.28	$199.44
Average other earnings and income			121.51	60.79	92.66	24.71
Average total net profit and income	$189.97	—$183.38	—$246.03	$2,391.89	$1,006.94	$224.15
Average bushels handled	57,385	46,739	53,586	126,106	88,033	60,305

(a) Separate profit data unobtainable.

are run up. It is generally necessary, therefore, for these elevators to try and make up in selling for what they suffer in increased costs.

Mill-line and commercial-line elevators are in a position to cut local costs for management and labor in buying and substitute central-office management in part. Also the mill-line elevators can shift losses on grain on to their flour departments and thus suffer less than other elevators. Their total cost of operation and their volume are usually low.

For these several reasons costs of handling grain through country elevators will now be presented for the several different types of elevators.

In comparing operating costs per bushel for the different types of elevators (Table XVI) it will be found that the costs of commercial-line and mill-line elevators ran highest both before and after the inclusion of interest and shrinkage (Table XVII), except in 1922, where a high interest charge on borrowed capital accounts for the high cost of twenty-one coöperative-line elevators, and in the case of one small coöperative line as high as 10 per cent was being paid for local call loans. This difference in cost is attributable almost entirely to the smaller volume of grain handled by the mill-line and commercial-line elevators, and not to disproportionately large operating costs.

If, for instance, costs per bushel for the different types in 1921 as shown in Table XVI were figured on the basis of the average volume per elevator for all types, that is at 77,233 bushels, the cost position of the different types would be considerably different from what Table XVI shows. The mill line, with an average cost of 3.6 cents per bushel, would be the lowest. The commercial line, with an average cost of 5.19 cents per bushel, would remain the highest cost group, though differing but little from the coöperative independents. The commercial independent, coöperative line, and cooperative independents show the following costs respectively: 3.87 cents per bushel, 4.42 cents per bushel, and 5.16 cents per bushel.

It would seem that solely from the standpoint of cost reduction the chief advantage of the coöperative type in reducing costs comes from the volume of business it is able to get, rather than from its ability to lower items of operating cost in any other way. This, of course, in no way measures the possibilities of the coöperative as an additional competitive factor in the local market or as a payer of dividends to patrons.

TABLE XVI.—COMPARISON OF AVERAGE OPERATING COSTS FOR SPECIFIED TYPES OF ELEVATORS, 1921 AND 1922.

In cents per bushel.

No. of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Salaries and wages.	Taxes.	Insurance.	Repairs.	Power, fuel, and light.	Depreciation.	Miscellaneous operating expense.	Office and miscellaneous administrative expense.	Total cost, excluding interest and shrinkage.
1921 Data.											
29	Mill line	55,224	2.77	.60	.21	.06	.14	.42	.14	.23	4.57
13	Commercial line	73,761	2.98	.55	.21	.23	.14	.44	.20	.46	5.22
11	Coöperative line	109,652	1.94	.38	.10	.06	.13	.36	.11	.35	3.40
4	Coöperative (Independent)	150,307	1.75	.27	.09	.06	.13	.34	.07	.43	3.14
2	Commercial (Independent)	94,178	2.08	.13	.13	.06	.12	.34	.09	.35	3.30
59	All types	77,223	2.43	.46	.16	.10	.15	.39	.13	.34	4.16
15	All coöperative	120,500	1.87	.33	.11	.06	.13	.35	.10	.37	3.32
44	All other	62,471	2.81	.56	.20	.11	.14	.41	.17	.32	4.72
30	All (excluding mill line)	98,189	2.26	.39	.14	.11	.13	.37	.13	.40	3.93

TABLE XVI—*Concluded.*

No. of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Salaries and wages.	Taxes.	Insurance.	Repairs.	Power, fuel, and light.	Depreciation.	Miscellaneous operating expense.	Office and miscellaneous administrative expense.	Total cost, excluding interest and shrinkage.
1922 Data.											
74	Mill line	46,739	3.43	.43	.25	.10	.17	.64	.09	.34	5.45
39	Commercial line	56,701	3.43	.38	.15	.11	.16	.56	.17	.59	5.55
21	Coöperative line	53,596	2.76	.40	.23	.10	.23	.73	.09	.48	5.02
49	Coöperative independents	121,074	2.03	.30	.15	.09	.15	.38	.18	.28	3.56
6	Commercial independents	93,424	2.57	.17	.11	.07	.22	.51	.07	.14	3.86
189	All elevators	70,310	2.70	.35	.19	.10	.17	.51	.14	.36	4.52
70	All coöperatives	100,828	2.14	.32	.16	.09	.17	.44	.16	.31	3.79
119	All (excluding coöperatives)	52,358	3.35	.39	.20	.10	.17	.60	.13	.41	5.35
115	All (excluding mill line)	85,477	2.46	.32	.16	.09	.17	.47	.16	.36	4.19
121	Group below average volume	41,905	3.66	.48	.25	.13	.20	.78	.15	.45	6.10
68	Group above average volume	122,302	2.09	.27	.13	.08	.15	.35	.13	.30	3.50

TABLE XVII.—COMPARISON OF INTEREST ON BORROWED FUNDS, INTEREST ON INVESTMENT, SHRINKAGE, AND OTHER OPERATING COSTS FOR SPECIFIED TYPES OF ELEVATORS, 1921 AND 1922.

In cents per bushel.

Number of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Total operating cost.	Interest on borrowed funds.	Interest at 6 per cent on investment, buildings, equipment, furniture, and fixtures.	Shrinkage.	Other operating costs.
1921 Data.							
22	Mill line	53,658	5.84	.24	.61	.48	4.51
11	Commercial line	65,196	6.92	.37	.65	.57	5.33
8	Coöperative line	96,034	5.42	.72	.51	.50	3.69
4	Coöperative independent	150,307	5.06	.29	.48	1.15	3.14
45	All types	72,603	5.83	.39	.56	.63	4.25
12	All coöperatives	114,125	5.25	.53	.49	.79	3.44
33	All other	57,504	6.25	.29	.61	.52	4.80
23	All (excluding mill line)	90,724	5.82	.48	.55	.71	4.10

TABLE XVII.—*Concluded.*

Number of elevators.	TYPE OF ELEVATOR.	Average number of bushels handled.	Total operating cost.	Interest on borrowed funds.	Interest at 6 per cent on investment, buildings, equipment, furniture, and fixtures.	Shrinkage.	Other operating costs.
1922 Data.							
74	Mill line	46,739	6.92	.18	.82	.47	5.45
39	Commercial line	56,701	7.14	.37	.72	.50	5.55
21	Coöperative line	53,596	7.55	1.15	.90	.48	5.02
49	Coöperative independent	121,074	4.90	.38	.48	.48	3.56
6	Commercial independent	93,424	5.33	.27	.70	.50	3.86
189	All elevators	70,310	6.03	.39	.64	.48	4.52
70	All coöperatives	100,828	5.32	.50	.55	.48	3.79
119	All (excluding coöperatives)	52,358	6.86	.26	.77	.48	5.35
115	All (excluding mill line)	85,477	5.73	.46	.59	.49	4.19
121	Group below average volume	41,905	8.02	.46	.98	.48	6.10
68	Group above average volume	122,302	4.76	.34	.44	.48	3.50

MARGINS ACTUALLY REALIZED OR PROFITS

The margin of profit for country elevators is seldom more than 1 to 2 cents per bushel, and there are frequent losses of 2 to 4 cents per bushel or more.

An elevator may be attempting to buy wheat on a 5-cent margin. Because of wild price fluctuations at the Kansas City market, the margin may be as much as 10 cents or more. What the elevator actually realizes on this wheat, however, will depend upon: (1) At what price the wheat is sold when it gets to market; and (2) the extent to which operating costs consume the margin taken.

Having noticed attempted buying margins, factors that cause them to fluctuate in size, and what it costs to operate local elevators. it is now well to observe what size margins of profit are actually realized by local elevators.

In 1921, twenty-nine mill-line elevators averaged a loss of 2.03 cents per bushel after the inclusion of interest as a cost. (Table XVIII.) Only six elevators out of twenty-nine made any profit. Thirteen commercial-line elevators averaged a profit of 1.5 cents per bushel. (Table XVIII.) Six of the thirteen elevators suffered losses of from 0.1 of a cent to 5 3/4 cents a bushel. Eleven coöperative-line elevators average a loss of 0.5 of a cent per bushel. Seven of the eleven had losses; one broke even and three made profits. (Table XVIII.) The small number of cooperative and commercial independent elevators averaged a profit of from 1.25 to 2 cents, with three elevators showing losses and three showing profits. (Table XVIII.)

In 1922, seventy-four mill-line elevators averaged a loss of 0.9 of a cent a bushel, (Table XVIII.) Seventeen out of seventy-four, or about 23 per cent, made any profit. This compares with six out of twenty-nine, or about 21 per cent, the year before. Twenty commercial-line elevators averaged a profit of less than 0.5 of a cent a bushel. (Table XVIII.) Ten of the twenty, or 50 per cent, made some profit. This compares with seven out of thirteen, or about 54 per cent, the previous year. Twenty-one coöperative-line elevators averaged a loss of 1.5 cents a bushel. (Table XVIII.) Six out of twenty, or 30 per cent, made profits. This compares with three out of eleven, or 27 per cent, the year before. Out of nineteen coöperative independent elevators fourteen, or 74 per cent, showed some profit. (Table XVIII.)

TABLE XVIII.—COMPARISON BETWEEN NET OPERATING PROFIT PER BUSHEL BEFORE AND AFTER THE INCLUSION OF INTEREST IN OPERATING COSTS OF INDIVIDUAL ELEVATORS, 1921 AND 1922.

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Mill-line Elevators—1921 Data						
1201	17,442	1.70	6.86	7.99	—5.16	—6.29
1202	22,029	5.90	6.24	7.99	—.34	—2.09
1203	23,398	.72	6.73	8.28	—6.01	—7.56
1204	23,890	3.16	8.36	10.40	—5.20	—7.24
1205	24,315	1.16	7.11	8.96	—5.95	—7.80
1206	27,138	—2.18	6.42	7.85	—8.60	—10.03
1207	29,662	—1.44	6.54	7.79	—7.98	—9.23
1208	32,506	3.43	6.85	8.25	—3.42	—4.82
1209	33,127	9.25	5.70	6.77	3.55	2.48
1210	36,136	12.10	4.20	5.02	7.90	7.08
1211	37,420	—.25	6.49	7.56	—6.74	—7.81
1212	37,570	3.94	4.71	5.95	—.77	—2.01
1213	38,864	2.68	4.55	5.58	—1.87	—2.90
1214	42,750	6.65	5.22	6.18	1.43	.47
1215	43,970	4.18	3.98	4.67	.20	—.49
1216	47,650	.06	4.72	5.65	—4.66	—5.59
1217	50,061	7.65	4.44	5.51	3.21	2.14
1218	51,989	5.82	5.00	5.87	.82	—.05
1219	52,083	1.07	4.29	4.97	—3.22	—3.90
1220	54,749	.07	5.21	5.99	—5.14	—5.92
1221	67,755	.13	4.47	5.18	—4.34	—5.05
1222	71,478	2.87	4.13	5.02	—1.26	—2.15
1223	73,226	4.50	4.76	5.62	—.26	—1.12
1224	76,684	—.88	3.70	4.36	—4.58	—5.24
1225	78,457	3.16	3.48	4.11	—.32	—.95
1226	103,231	5.70	4.01	4.52	1.69	1.18
1227	106,354	1.17	5.47	6.14	—4.30	—4.97
1228	126,425	.24	3.33	3.81	—3.09	—3.57
1229	171,724	8.27	2.81	3.18	5.46	5.09
Average	55,224	3.37	4.57	5.39	—1.21	—2.03

TABLE XVIII—*Continued.*

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Commercial-line Elevators—1921 Data						
1241	35,918	8.70	7.22	8.62	1.48	.08
1242	38,566	6.18	7.42	9.20	—1.24	—3.02
1243	48,630	10.35	6.27	7.34	4.08	3.01
1244	57,067	9.37	6.70	7.78	2.67	1.59
1245	63,149	4.47	4.95	5.78	—.48	—1.31
1246	64,477	10.12	6.09	7.33	4.03	2.79
1247	65,266	12.01	5.02	6.25	6.99	5.76
1248	75,420	5.63	6.25	7.19	—.62	—1.56
1249	80,286	1.34	4.60	5.28	—3.26	—3.94
1250	87,587	6.59	3.72	4.38	2.87	2.21
1251	100,794	8.73	3.95	4.95	4.78	3.78
1252	102,381	5.16	4.20	5.33	.96	—.17
1253	139,358	6.07	5.33	6.19	.74	—.12
Average	73,761	7.74	5.22	6.22	2.52	1.52
Coöperative-line Elevators—1921 Data						
1261	50,047	5.14	3.74	6.39	1.40	—1.25
1262	71,753	1.70	2.62	4.86	—.92	—3.16
1263	76,537	7.08	6.10	7.34	.98	—.26
1264	87,363	4.84	3.99	6.53	.85	—1.69
1265	97,154	5.97	3.48	4.47	2.49	1.50
1266	97,578	7.15	4.58	6.30	2.57	.85
1267	100,718	7.46	5.95	7.42	1.51	.04
1268	104,415	.53	2.57	2.98	—2.04	—2.45
1269	120,029	3.28	2.71	4.35	.57	—1.07
1270	147,625	3.18	3.05	3.55	.13	—.37
1271	252,958	2.64	1.90	2.64	.74	.....
Average	109,652	4.18	3.40	4.66	.78	—.48

TABLE XVIII—*Continued.*

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Coöperative Independent Elevators—1921 Data						
1281	116,234	1.17	3.84	4.94	—2.67	—3.77
1282	135,508	9.21	3.33	4.17	5.88	5.04
1283	171,178	2.40	2.80	3.47	—.40	—1.07
1284	178,309	7.44	2.86	3.41	4.58	4.03
Average	150,307	5.18	3.14	3.90	2.04	1.28
Commercial Independent Elevators—1921 Data						
1291	41,445	3.45	6.83	7.71	—3.38	—4.26
1292	146,910	6.95	2.30	2.93	4.65	3.84
Average	94,178	6.21	3.30	4.04	2.91	2.17
Mill-line Elevators—1922 Data						
1	4,100	—1.38	46.46	47.65	—47.84	—49.03
2	5,400	5.75	21.82	28.71	—16.07	—22.96
3	7,900	9.30	12.90	17.11	—3.60	—7.81
4	11,700	4.35	3.93	5.34	.42	—.99
5	12,263	5.52	8.49	12.05	—2.92	—6.53
6	15,588	14.09	14.89	17.85	—.80	—3.76
7	19,994	3.21	10.99	13.94	—7.78	—10.73
8	21,651	3.60	5.06	6.67	—1.46	—3.07
9	21,699	4.36	9.50	10.86	—5.14	—6.50
10	24,088	3.96	5.06	5.81	—1.10	—1.85
11	25,461	5.41	6.73	8.05	—1.32	—2.64
12	25,968	4.28	10.09	11.71	—5.81	—7.43
13	26,220	5.86	5.76	6.69	.10	—.83
14	26,800	3.60	5.73	7.01	—2.13	—3.41
15	28,846	6.79	7.27	8.26	—.48	—1.47
16	29,341	9.35	4.71	6.00	4.64	3.35
17	29,316	6.74	6.60	8.56	.14	—1.82
18	29,559	—3.24	5.49	6.83	—8.73	—10.07
19	29,617	5.18	7.31	8.34	—2.13	—3.26
20	30,178	.08	4.86	5.98	—4.78	—5.90
21	30,511	6.08	7.05	8.42	—.97	—2.34
22	31,158	3.96	7.36	8.59	—3.40	—4.63

TABLE XVIII—*Continued.*

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Mill-line Elevators—1922 Data.—*Continued.*						
23	31,377	6.92	7.83	9.03	—.91	—2.11
24	33,388	6.09	6.07	6.87	.02	—.78
25	33,401	9.16	7.65	9.93	1.51	.23
26	34,250	7.58	5.66	6.44	1.92	1.14
27	34,453	4.03	4.75	6.22	—.72	—2.19
28	35,526	4.46	7.54	8.89	—3.08	—4.43
29	35,596	7.02	6.90	8.30	.12	—1.28
30	36,114	7.66	8.00	9.31	—.34	—1.65
31	36,560	8.01	7.68	8.64	.33	—.63
32	37,022	6.32	6.55	7.78	—.23	—1.46
33	37,457	6.11	5.84	6.83	.27	—.72
34	38,220	8.50	6.52	7.68	1.98	.82
35	38,795	8.62	6.89	8.11	1.93	.51
36	39,297	5.96	6.86	8.52	—.90	—2.56
37	42,509	5.04	4.89	5.40	.15	—.36
38	43,058	3.62	6.10	7.35	—2.48	—3.73
39	43,779	6.72	10.10	12.63	—3.38	—5.91
40	44,350	6.32	4.08	4.94	2.24	1.38
41	44,796	5.07	5.05	6.03	.02	—.96
42	45,046	4.80	4.30	5.12	.50	—.32
43	46,272	6.76	6.02	7.16	.74	—.40
44	46,408	6.99	5.89	7.03	1.10	—.04
45	47,930	8.26	5.43	6.40	2.83	1.86
46	48,398	2.86	4.34	5.12	—1.48	—2.26
47	50,652	6.24	5.52	6.62	.72	—.38
48	50,916	5.43	5.35	6.29	.08	—.86
49	51,100	6.13	6.47	7.58	—.34	—1.43
50	51,762	8.14	6.54	8.28	1.60	—.14
51	52,997	2.37	5.55	6.69	—3.18	—4.32
52	54,870	3.27	3.56	4.39	—.29	—1.12
53	56,314	6.07	5.43	6.74	.64	—.67
54	57,678	5.35	5.38	6.40	—.03	—1.05
55	60,100	3.50	5.05	5.93	1.55	—2.43
56	62,399	4.09	4.56	5.20	—.47	—1.11

TABLE XVIII—*Continued.*

Net Operating Profit or Loss Per bushel

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Mill-line Elevator—1922 Data—*Concluded.*						
57	63,449	7.23	5.00	5.66	2.23	1.57
58	64,828	3.41	4.97	5.83	—1.56	—2.42
59	64,964	2.66	4.64	5.13	—1.98	—2.47
60	65,446	4.00	6.84	8.07	—2.84	—4.07
61	66,975	5.51	5.48	6.53	.03	—1.02
62	70,058	7.51	4.43	5.03	3.08	2.48
63	72,749	6.90	3.36	3.90	3.54	3.00
64	72,762	9.52	6.59	7.71	2.93	1.81
65	74,814	1.54	4.21	4.81	—2.67	—3.27
66	82,341	5.29	3.74	3.98	1.55	1.31
67	84,134	7.78	5.23	6.19	2.55	1.58
68	85,515	5.41	4.28	5.13	1.13	.28
69	86,785	3.64	3.28	3.78	.36	.14
70	89,896	5.89	3.49	4.06	2.40	1.83
71	92,592	2.71	3.33	3.92	—.62	—1.21
72	95,435	1.31	3.57	3.95	—2.26	—2.64
73	96,254	6.15	3.90	4.68	2.25	1.47
74	139,038	4.89	3.40	3.80	1.49	—1.09
Average	46,732	5.56	5.46	6.46	.10	—.90
Commercial-line Elevators—1922 Data						
1	15,571	3.23	13.14	16.21	—9.91	—12.98
2	18,523	6.58	8.56	9.54	—1.98	—2.96
3	21,215	7.33	7.45	7.82	—.12	—.49
4	21,273	9.97	11.08	13.19	—1.11	—3.22
5	30,590	11.41	6.85	7.59	4.56	3.82
6	32,716	8.49	7.94	9.26	.55	—.77
7	35,801	5.26	7.14	8.40	—1.88	—3.14
8	37,843	7.22	4.99	6.70	2.23	.52
9	39,813	9.69	7.02	7.34	2.67	2.35
10	42,702	8.40	6.03	7.13	2.37	1.27
11	42,870	7.70	5.87	6.79	1.83	.91
12	50,835	6.72	5.18	6.19	1.54	.53
13	56,473	4.53	6.63	8.40	—2.10	—3.87

TABLE XVIII—*Continued.*

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Commercial-line Elevator—1922 Data—*Concluded.*						
14	63,150	1.88	4.67	5.84	—3.79	—3.96
15	68,644	7.58	4.04	4.68	3.54	2.90
16	75,049	3.66	5.08	6.09	—1.42	—2.43
17	83,828	2.93	4.27	5.24	—1.34	—2.31
18	84,194	6.37	4.57	5.14	1.80	1.23
19	116,082	8.52	3.48	4.19	5.04	4.33
20	133,090	7.26	4.38	5.11	2.88	2.15
Average	53,513	6.46	5.39	6.42	1.07	.04
Coöperative-line Elevators—1922 Data						
1	23,821	5.07	4.86	9.55	.21	—4.48
2	27,868	.71	7.21	11.04	—6.50	—10.33
3	29,736	7.99	6.71	10.45	1.28	—2.46
4	30,688	—.98	8.35	12.02	—9.33	—13.00
5	35,308	9.50	6.64	9.38	2.86	.12
6	38,537	—.54	6.09	8.72	—6.63	—9.26
7	41,463	6.23	5.67	8.07	.56	—1.84
8	45,693	17.69	5.56	6.60	12.13	11.09
9	49,665	4.77	5.04	7.33	.27	—2.56
10	50,410	8.85	6.32	7.79	2.53	1.06
11	53,611	6.83	5.29	5.82	1.54	1.01
12	55,256	9.64	6.40	11.55	3.24	—1.91
13	59,816	4.58	4.52	5.56	.06	—.98
14	61,459	4.43	5.68	8.01	—1.25	—3.58
15	63,622	2.31	2.64	3.22	—.31	—.91
16	68,754	7.59	6.54	9.01	1.05	—1.42
17	70,313	6.15	3.77	4.48	2.38	1.67
18	73,299	4.09	3.48	3.78	.61	.31
19	76,936	3.40	4.52	7.09	—1.12	—3.69
20	83,981	3.27	4.45	7.02	—1.18	—3.75
21	85,618	4.09	2.82	4.17	1.27	—.08
Average	53,612	5.50	5.02	7.07	.48	—1.57

TABLE XVIII—*Concluded.*

ELEVATOR NO.	Number of bushels handled.	Operating margin per bushel.	Operating cost per bushel.		Net operating profit or loss per bushel.	
			Not including interest (*a*).	Including interest (*b*).	Before interest.	After interest.
Coöperative Independent Elevators—1922 Data						
1	53,705	7.75	5.67	7.68	2.08	.07
2	66,540	11.07	4.69	5.91	6.58	5.16
3	75,072	4.90	5.14	6.35	—.24	—1.45
4	81,740	6.03	4.33	6.97	1.70	—.94
5	90,785	5.00	4.24	5.11	.76	—.11
6	95,846	6.89	3.52	3.99	3.37	2.90
7	110,072	4.18	5.01	6.19	— .83	—2.01
8	114,934	6.80	3.35	3.73	3.45	3.07
9	117,125	7.47	3.70	4.41	3.77	3.06
10	117,447	4.47	3.42	4.58	1.05	—.11
11	126,262	6.84	3.70	5.17	3.14	1.67
12	138,135	6.67	3.50	4.13	3.17	2.54
13	139,020	7.01	2.30	2.53	4.71	3.48
14	139,850	5.14	2.91	3.41	3.23	1.73
15	162,646	7.82	2.59	3.57	5.23	4.25
16	167,377	5.76	2.91	3.30	2.85	2.46
17	188,671	7.79	2.64	3.78	5.15	4.01
18	189,358	7.79	3.81	4.77	3.98	3.02
19	221,440	5.19	1.83	1.99	3.36	3.20
Average	126,106	6.37	3.40	4.21	2.97	2.18

(*a*) Shrinkage not included in operating cost.
(*b*) Interest includes actual interest paid on borrowed funds and interest on investment in buildings and equipment computed at the rate of 6 per cent.

As regards profits or net margin actually realized from local elevator operation, this study leads to about the same conclusion reached in studies made of other areas. In ordinary years the net profit is between 1 and 2 cents a bushel in the majority of cases. In a study of the spring-wheat region of the Northwest it has been concluded that, "In ordinary years margins and expenses seem to be fairly well adjusted to each other, and leave a fairly regular net profit of not far from 2 cents a bushel."[10]

It would seem, therefore, that the present margin on which most

10. John D. Black and H. Bruce Price, Costa and Margins in Marketing, Publication 1868 The Annals of the American Academy of Political and Social Science.

local elevators in Kansas are trying to buy wheat covers costs and leaves only from 1 to 2 cents a bushel to cover risks of various kinds.

The elements of risk or accidental factors that must in some way be taken into account in settling upon a local buying margin have already been pointed out. (Page 18.) They are fluctuations in the terminal market prices, fluctuations in the size of the crop, competition, and quality of the crop.

A glance at Table XVIII will show that not always are low-cost elevators highly profitable elevators. One elevator may make a profit by having a low cost that will come within the limits of the average price received. Another with higher costs may make a profit by selling at a better than average price. Buying and selling operations of the local elevator, independent in a measure of operating costs, may be the source of profits.

DISTRIBUTION OF GRAIN SALES AND SEASONAL FLUCTUATIONS IN PRICES

For a group of fifty-nine elevators in 1921 the difference between average purchase price or price paid the producer and the average sales price less freight was 6 cents a bushel. After deducting terminal marketing expenses there was left a margin of 4.86 cents a bushel to cover expenses of operating the local elevator. Local operating expenses for this group of elevators averaged 5.12 cents a bushel. This left an average loss of about 0.25 of a cent a bushel.

Results obtained by different groups of elevators varied widely from this average. (Table XIX.) While the data in Table XIX are too limited to be indicative of the relative sales efficiency of the different types of elevators in the state as a whole, they do indicate the importance of price received from sales in determining whether a profit, or loss is made. For instance, in 1921 the thirteen commercial-line elevators with the high operating cost of 6.22 cents a bushel were able to earn 1.52 cents a bushel profit largely because of the high average sales price of $1.13 a bushel.

This higher average price received was partly due to a larger proportion of sales than average at a time when the market was strong. In figure 6 the monthly distribution of sales by these thirteen line elevators is compared with the average for forty-eight elevators of all types and with the average for ten coöperative elevators. The average monthly prices at Kansas City, the price-basing point, are shown for comparison with the months when largest sales were made. The larger sales by the line elevators in September, January and March account for part of the advantage in average sales price for the season.

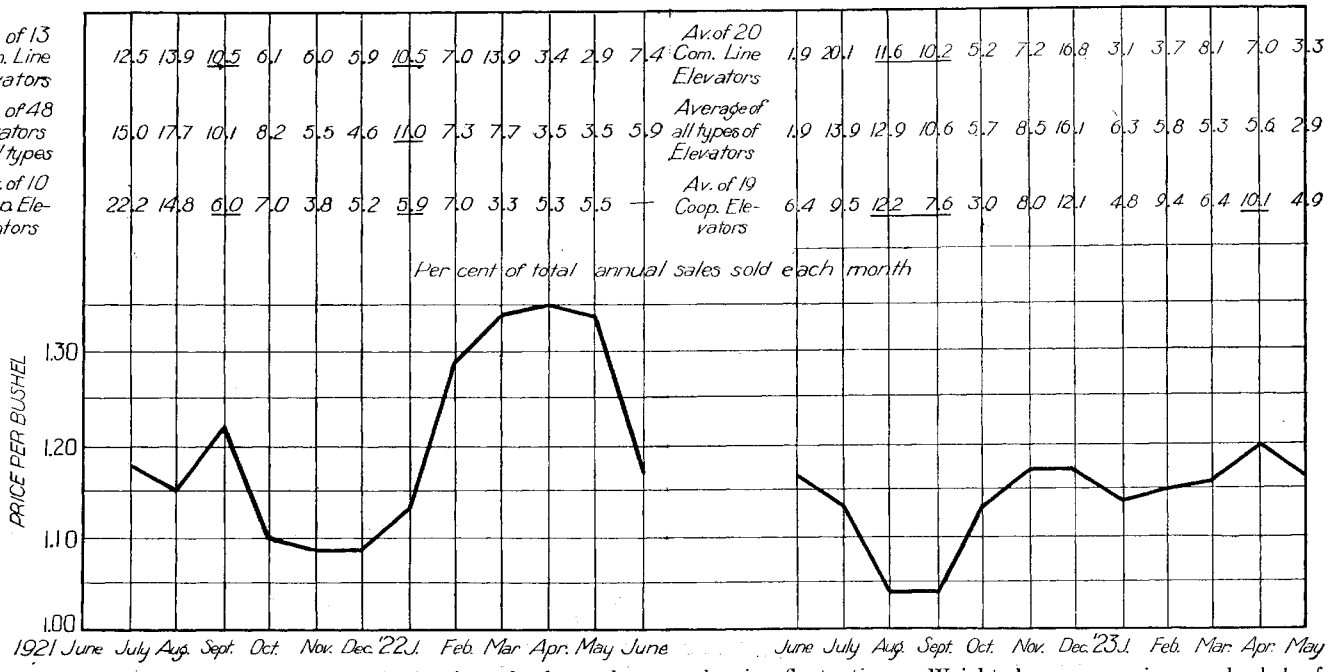

FIG. 6.—The relation between seasonal distribution of sales and seasonal price fluctuations. Weighted average price per bushel of Kansas City No. 2 hard winter wheat.

TABLE XIX.—AVERAGE PURCHASE PRICE, AVERAGE SALE PRICE, AND AVERAGE GROSS MARGIN REALIZED COMPARED WITH LOCAL OPERATING EXPENSE AND NET PROFIT PER BUSHEL, 1921 AND 1922.

In cents per bushel.

Number of elevators.	Type of Elevator.	Average price paid producer.	Average gross price received from sales freight deducted.	Average gross margin realized.	Average gross margin after deducting commercial marketing expense.	Local operating expense to come out of gross margin.	Net profit or loss.
1921 Data.							
29	Mill line	105.1	108.97	3.87	3.37	5.40	−2.03
13	Commercial line	103.9	113.08	9.18	7.74	6.22	1.52
11	Coöperative line	105.0	110.71	5.71	4.18	4.66	−.48
4	Coöperative (Independent)	102.4	108.88	6.48	5.18	3.90	1.28
2	Commercial (Independent)	104.4	112.21	7.61	6.21	4.04	2.17
59	All types	104.4	110.40	6.00	4.86	5.12	−.26
1922 Data.							
74	Mill line	93.97	101.33	7.36	5.56	6.46	−.90
20	Commercial line	95.35	103.41	8.06	6.46	6.42	.04
21	Coöperative line	96.19	103.29	7.10	5.50	7.07	−1.57
19	Coöperative independent	96.17	104.14	7.97	6.37	4.21	2.18

It is quite noticeable that in 1922 (Table XIX) the group of twenty commercial-line elevators average a profit of only 0.04 of a cent a bushel, while the cooperative independents averaged 2.18 cents. The commercial-line elevators did not compare as favorably with the coöperative independents in respect to profit as they did the year before.

Operating costs run a little more than 2 cents a bushel higher for the twenty commercial-line elevators than for the nineteen cooperative independents. The line elevators had no offset for these higher costs in the form of a higher average sales price such as they had in the 1921 comparison of costs, prices, and profits.

The fact is there was no such opportunity in 1922 for averaging a high sales price such as there was in 1921. (Fig. 6.) Prices from month to month were quite steady except during August and September. Seasonal distribution of sales, therefore, had less effect on the season's average price, Such a market favored the elevators that had the lowest costs. What advantage there was from a favorable distribution of sales this second year rested with the coöperatives, as indicated in figure 6.

The experiences of this limited group of elevators suggest that in their case at least the strength of the cooperative group lies largely in their ability to cut costs through assembling large volumes of grain. Since cooperation automatically contributes to this end, a problem calling for more initiative in cooperative management is that of sales policy. On the other hand the principal weapon of the ordinary commercial elevator in competition with the cooperative lies largely in its ability to outsell, if possible, its coöperative competitor. With a steady market there is little to be gained from selling ability on the part of commercial elevators. With a highly fluctuating market, such as frequently exists, or with shifts to new price levels, skillful distribution of sales may go a long way toward overcorning the handicap of higher costs, which are largely due to the relatively small volume of business handled.

METHODS OF SALE AND PRICE

Average sales price for the season may also be affected materially by the method of sale employed by the elevator. Few elevators use exclusively one method of sale, Most of them will sell a part of their wheat on consignment, a part, "to arrive" and a part "on track." Managers frequently attempt to consign on what they believe is going to be a rising market, and sell "to arrive" or "on

track'' when they are looking forward to a declining market. Also, because of the special quality of certain wheat, it may receive an "on track" bid that induces the manager to sell on that basis. These and other local circumstances cause the elevator manager at times to sell some wheat "on track'' and "to arrive" though it is quite often believed that "on track" and "to arrive" bids are most of the time below spot prices at Kansas City.

Differences in practice with regard to the per cent of sales made by the different methods are indicated in Table XX. The figures for the mill-line elevators are not comparable with those for other types. All the wheat of these elevators, except a small per cent of off-grade milling wheat, is shipped to the mills and sold by the grain department of the mill direct to the milling department. This accounts for practically all sales being made on what amounts to a "to arrive" basis.

TABLE XX.—COMPARISON BETWEEN PER CENT DISTRIBUTION OF WHEAT SALES VOLUME BY VARIOUS METHODS OF SALE FOR SPECIFIED TYPES OF ELEVATORS, 1921-'22.

Number of elevators.	TYPE OF ELEVATOR.	Consigned sales.	To arrive sales.	On track sales.	To arrive and on track sales, combined.
29	Mill line	8.4	91.6	.....	91.6
13	Comm'l line	62.7	37.3	.....	37.3
11	Coöperative line	65.1	32.4	2.5	34.9
4	Coöperative indp	56.1	32.7	11.2	43.9
2	Comm'l indp	63.8	19.4	16.8	36.2
59	All types	43.4	53.7	2.9	56.6
15	All coöperatives	62.1	32.4	5.5	37.9
44	All other	31.1	67.7	1.2	68.9
30	All (excluding mill line)	62.4	33.1	4.5	37.6

TABLE XXI.—INCREASED OR DECREASED COST PER BUSHEL OF GRAIN HANDLED BY GROUPS OF DIFFERENT SIZE IN PER CENT ABOVE OR BELOW THE AVERAGE FOR ALL ELEVATORS, 1922-'23.

GROUP.	Volume compared with average.	Salaries and wages.	Taxes.	Insurance.	Repairs.	Power and light.	Depreciation.	Miscellaneous operating expense.	Office expense, etc.	Total excluding interest.
to 25,000 bushels	—76.3	101.9	165.8	110.6	90.0	64.8	198.1	207.2	50.0	115.5
25,000 to 50,000 bushels	—47.2	45.9	37.2	47.4	40.0	17.7	64.8	0.0	25.0	43.2
50,000 to 75,000 bushels	—12.9	17.0	11.5	10.6	10.0	11.8	17.7	—7.1	19.5	15.5
75,000 to 100,000 bushels	21.5	—3.7	—8.6	—10.6	—20.0	—5.9	—13.8	14.3	5.6	—4.6
100,000 to 125,000 bushels	59.8	—23.0	—11.5	—26.4	—10.0	11.8	—33.4	—7.1	—30.6	—21.0
125,000 to 150,000 bushels	96.3	—22.2	—25.8	—36.9	—30.0	—5.9	—43.2	—21.5	8.4	—22.6
150,000 to 175,000 bushels	131.7	—33.0	—37.2	—42.2	—10.0	—35.3	—29.5	—50.0	—33.6	33.5
175,000 to 200,000 bushels	172.9	—41.9	—2.8	—52.7	10.0	—29.5	—49.1	—14.3	13.9	—33.2
200,000 to 225,000 bushels	199.2	—43.4	—54.3	—21.1	—30.0	—35.3	—58.8	21.5	—52.8	—43.2
225,000 and over	264.7	—40.8	—22.9	—52.7	—50.0	—35.3	—49.1	57.2	—66.7	39.8

VOLUME OF GRAIN HANDLED AND COST PER BUSHEL

A decrease in volume of grain handled of as much as 76 per cent below average meant, in the case of the elevators studied in 1922-'23, an increase in total costs per bushel of 115.5 above average. (Table XXI.)

A decrease in volume of 47 per cent below average meant an increase in costs of 43 per cent above average. A volume of 13 per cent below average meant costs 15.5 per cent above average. A volume 21.5 per cent above average meant a decrease in costs per bushel of 4.6 per cent below average.

It will be observed (Table XXI) that as volume continues to increase above average volume the average total cost per bushel show an increasing per cent reduction below average costs per bushel. It is quite noticeable, however, that as between 60 per cent increase and 96 per cent increase in volume there is little difference in effect on total costs per bushel. The same is true as regards each other in the case of the 132 and 173 per cent increases in volume and the 200 and 264 per cent increases.

The rate at which increased volume of business makes a return in the form of reduced costs per bushel of grain handled can be shown by indicating the per cent change in costs a bushel for each 1 per cent change in volume from the average. The results of such a comparison are as follows: For size groups one, two, and three each 1 per cent in volume below average gives a cost per bushel of 1.51, 0.90, and 1.2 per cent above the average, respectively. For size groups four to ten, inclusive, each 1 per cent in volume above average gives a cost per bushel, respectively, of 0.21, 0.35, 0.23, 0.25, 0.19, 0.22, and 0.15 per cent below average.

From this observation it seems apparent that increased volume brings increasingly greater returns in the form of reduced costs up to and including group five. After this group, though costs a bushel still decline with increased volume, they decline at a diminishing rate. Maximum returns for added volume, therefore, appear to be reached when the 100- to 125-thousand bushel group of elevators is reached. This applies of course only to elevators operating under conditions similar to those surrounding the elevators included in this study.

The matter may be made even clearer by referring to actual costs per bushel (Table XXII) rather than to per cents. It will be noted that total costs per bushel, excluding interest and shrinkage, decrease

TABLE XXII.—AVERAGE OPERATING COST PER BUSHEL, 1922-'23.

By size groups.

No. of elevators.	SIZE OF GROUP (1,000 bushels).	Average number of bushels handled.	Items of operating cost (in cents per bushel).												Total.
			Salaries and wages.	Taxes.	Insurance.	Repairs.	Power, fuel, and light.	Depreciation.	Miscellaneous operating expenses.	Miscellaneous office and administrative expense.	Total.	Interest on borrowed working capital.	Interest at 6 per cent on fixed investment.	Shrinkage.	
17	Below 25	16,667	5.45	0.93	0.40	0.19	0.28	1.52	0.43	0.54	9.74	.52	1.86	0.48	12.60
63	25 to 50	37,113	3.94	.48	.28	.14	.20	.84	.14	.45	6.47	.48	1.05	.48	8.48
46	50 to 75	61,211	3.16	.39	.21	.11	.19	.60	.13	.43	5.22	.40	.76	.48	6.86
27	75 to 100	85,437	2.60	.32	.17	.08	.16	.44	.16	.38	4.31	.58	.56	.48	5.93
12	100 to 125	112,354	2.08	.31	.14	.09	.19	.38	.13	.25	3.57	.31	.48	.49	4.85
9	125 to 150	138,036	2.10	.26	.12	.07	.16	.29	.11	.39	3.50	.29	.36	.48	4.63
6	150 to 175	162,933	1.81	.22	.11	.09	.11	.36	.07	.24	3.01	.09	.46	.49	4.05
3	175 to 200	191,882	1.57	.34	.09	.11	.12	.26	.12	.41	3.02	.52	.36	.50	4.40
3	200 to 225	210,380	1.53	.16	.15	.07	.11	.21	.17	.17	2.57	.01	.26	.49	3.33
3	225 and over	256,440	1.60	.27	.09	.05	.11	.26	.22	.12	2.72	.30	.34	.50	3.86
189	Average	70,310	2.70	.35	.19	.10	.17	.51	.14	.36	4.52	.39	.64	.48	6.03
121	Group below average volume	41,905	3.66	.48	.25	.13	.20	.78	.15	.45	6.10	.46	.98	.48	8.02
68	Group above average volume	122,302	2.09	.27	.13	.08	.15	.35	.13	.30	3.50	.34	.44	.48	4.76

very rapidly from 9.74 cents per bushel in group one to 3.57 cents per bushel in group five. Thereafter the decrease in cost averages only 0.5 to 1 cent a bushel.

Likewise (Table XXII) salary and wage cost per bushel decreases from 5.45 cents a bushel in group one to 2.08 cents per bushel in group five. In the higher volume groups salary and wage cost varies only from an average of 1.53 cents a bushel to 2.10 cents a bushel.

It is evident, then, that in the case of salary and wage cost, which makes up so large a part of total costs, rate of gain from increased

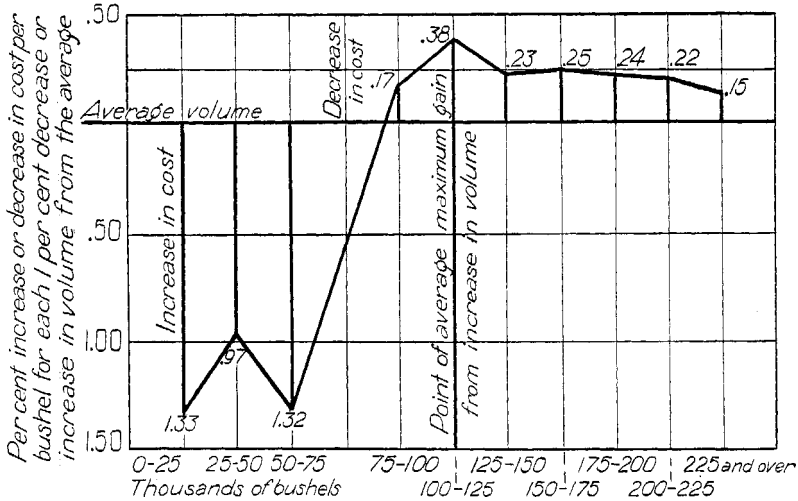

FIG. 7.—Salary and wage gain for each 1 per cent increase in volume of business above the average. (1922-'23 data—189 elevators.)

volume of business declines after 100,000 to 125,000 bushels is reached. The rate at which salary and wage cost a bushel decreases with each per cent increase in volume compared with the average is shown in figure 7. The base line represents the average. Decreased cost below average is shown as a gain above the average line equal to the decline in costs. Likewise increased cost in the case of the low volume groups is shown as a loss below the average equal to the increase in costs.

As in the case of total costs per bushel, group five (100,000 to 125,000 bushels) shows maximum gain from decreased salarly and wage cost per unit of increase in volume of business.

It seems, therefore, that after the volume of business reaches

100,000 to 150,000 bushels an elevator, the gain that additional volume may give in reduced costs is much more easily offset by any weakness in selling policy than it is up to this point. A point is reached where increased volume becomes less effective in reducing costs. At the same time selling problems, safe buying price, and the problem of car supply become increasingly more difficult with the increase in volume per elevator.

This situation suggests the economy of attempting to combine elevators consistently handling less than 100,000 bushels of grain. It also suggests the advisability of generally diversifying investments over several establishments rather than going to unusual expense or adopting a high-price policy in an effort to get extraordinary volume in hopes of reaching a cost, too low for competitors to meet. This suggestion is still further supported by the reduction in risk (of volume) from sectional crop shortages that a line of elevators might offer.

AVERAGE LOCAL ELEVATOR OPERATING COSTS

While the local elevator margin or the price for local elevator service is determined by factors other than average cost, of the service alone, the latter does affect the number of elevators that fail because they do not or cannot keep costs within the prevailing buying margin.

Evidence collected (Tables XXIII and XXIV) shows that total cost of local elevator operation per bushel of grain handled averages between 7 and 8 cents a bushel. This includes interest on investment, shrinkage, and terminal marketing costs.

If total costs of operation under present competitive conditions are compared with average buying margins (Table XXV) it is apparent that profit, if any, must come in the main from fortunate buying and selling rather than from the merchandising margin taken. Profit depends considerably upon speculative gains rather than on straight merchandising gains. Wider margins, consolidations of elevators, and a further development of line systems, cooperative or otherwise, in order to spread risk are the most apparent remedies for this instability in the local grain-handling business.

This is another of those apparently anomalous cases where average cost exceeds average price, as is so often shown in the case of average farm costs and average farm prices. To cover all legitimate costs would take an average buying margin of 7 to 8 cents a bushel under present operating conditions in Kansas.

TABLE XXIII.—AVERAGE LOCAL ELEVATOR OPERATING COSTS IN KANSAS SHOWING IMPORTANT ITEMS OF COST.

	1920-'21.	1921-'22.	1922-'23.
	138 elevators, by questionnaire.	59 elevators, by audit.	189 elevators, by audit.
Salary	$2,040	$1,696	$1,707
Labor	543	181	200
Insurance	122	128	127
Taxes	296	360	248
Power	185	91	119
Heat and light	20	15	
Depreciation	316	300	361
Office, audit, etc	180	266	249
Miscellaneous	202	103	100
Repairs		176	169
Total	$3,904	$3,213	$3,180
Interest on investment	$306	$432	$460
Interest on working capital	310	301	272
Shrinkage	649	487	308
Total	$1,265	$1,220	$1,040
Grand total	5,169	4,433	4,220
Bushels handled	95,616	77,223	70,310
Operating cost per bushel	5.4c.	5.7c.	6.0c.
Terminal marketing cost per bushel	1.8c.	1.7c.	1.7c.
Grand total cost per bushel	7.2c.	7.4c.	7.7c.

TABLE XXIV.—AVERAGE LOCAL ELEVATOR OPERATING COSTS IN KANSAS SHOWING IMPORTANT ITEMS OF COST DETERMINED BY TWO METHODS.

	1921-'22.		1922-'23.	
	59 elevators, by audit.	73 elevators, by questionnaire.	189 elevators, by audit.	33 elevators, by questionnaire.
Salary	$1,696	$1,897	$1,707	$2,067
Labor	181	300	200	250
Insurance	128	227	127	218
Taxes	360	318	248	374
Power	91	165	119	210
Heat and light	15	25		
Depreciation	300	399	361	416
Office, audit, etc	266	195	249	220
Miscellaneous	103	323	100	313
Repairs	73	188	69	211
Total	$3,213	$4,037	$3,180	$4,279
Interest on investment	$432	$656	$460	$831
Interest on working capital	301	674	272	481
Shrinkage	487	536	308	454
Totals	$1,220	$1,866	$1,040	$1,766
Grand totals	4,433	5,903	4,220	6,045
Bushels handled	77,223	112,174	70,310	100,248
Operating cost per bushel	5.7c.	5.3c.	6.0c.	6.0c.
Terminal marketing costs per bushel	1.7c.	1.7c.	1.7c.	1.7c.
Grand total cost per bushel	7.4c.	7.0c.	7.7c.	7.7c.

TABLE XXV.—AVERAGE BUYING MARGINS ON WHEAT COMPARED WITH AVERAGE OPERATING COSTS INCLUDING TERMINAL MARKETING COSTS.

	1920-'21.	1921-'22.	1922-'23.
Average buying margin, cents per bushel	5.95	5.28	4.84
Average total cost of operation, cents per bushel	7.20	7.40	7.80
Average operating cost per bushel excluding salary and int. on investment	5.10	5.20	5.30

The average margin taken in buying is just about enough to cover operating costs, leaving out salary and interest on investment. This means that the buying margin on the average covers other expenses and leaves the manager to speculate or shrewdly manage in some manner or other to make his salary and interest on investment.