A STUDY OF EXPENSES AND MARGINS PER DOLLAR OF SALES IN COOPERATIVE ELEVATORS IN RELATION TO NET PROFIT DURING PERIODS OF PRICE CHANGES

by

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TABLE OF CONTENTS

PURPOSE OF THE STUDY

The purposes of this study are: (1) To analyze the variations in the expense per dollar of sales in cooperative elevators in southwestern Kansas due to fluctuations in price levels; (2) To determine the effect of fluctuations in prices and volume of business on the elevators' ability to show a saving; (3) To indicate some of the adjustments that were made by the associations to meet increases in expense per dollar of sales; and (4) To point out the hazards of over-investment in facilities in a territory of widely fluctuating yields.

It is hoped that this study will furnish practical information to cooperative elevator managers and directors which will assist them in readily recognizing some of the limitations of adjusting expenses to volume in such periods and which will furnish them a measure by which adjustments may be made.

There has been little work done which deals with measures of margins, expenses, and profit in relation to the total dollars of sales. The most common measure has been the margin, expense, and profit per bushel handled. Post (13) shows that there is a close relationship between measures on a physical unit basis and value basis, and that

measures can be made on the dollars of sales basis, although he used the 10-year average price multiplied by the fluctuations in volume.

Green and Rucker (9) in their bulletin set up standards on the basis of dollars of sales. Green (6) in a report on Kansas and Oklahoma elevators states, "The problem of separating expenses or costs into grain and sideline costs is so tedious that there may well be questions of whether the returns will justify the labor. It is important, however, that the elevator manager have some criterion by which to judge its expense. Expenses per dollar of sales, with all its faults as a measure, avoids the difficulties of trying to separate grain and sideline expense."

REVIEW OF LITERATURE

Previous studies of cooperative elevators have considered the effectiveness of the association in terms of the expenses and margins on a per bushel basis. Most of the previous studies were made during the period 1925-1936, and during the early part of that period sidelines were not as important as in the latter part. With the increasing importance of sidelines and impracticability of keeping accurate cost accounts between grain and sidelines it is advisable to study the possibility of using dollar sales as

the basis in comparing expenses, margins, and profit or loss.

Ballinger (1) summarized the financial records of a group of farmers' elevators in Oklahoma for the period 1930-1932. Ballinger made his comparisons on the basis of dollar of sales as a measure of volume. He showed that the volume of sales in terms of dollars decreased more than the volume measured in bushels of grain. His comparisons were all made on the averages of groups divided as follows: Less than $50,000 of sales, more than $50,000 and less than $100,000, and those with more than $100,000 sales. His data indicated that in 1932 sidelines constituted approximately 10 per cent more of the total sales than they did in 1930. He stated that gross profit per dollar of sales of the elevators increased each year. This was necessary as he also showed that average expenses of the elevators did not decrease from 1930 to 1932, while average sales dropped from $191,625 in 1928 to $63,479 in 1932. Ballinger also indicated that the majority of the associations with sales of less than $50,000 showed losses, while a majority of those with sales of $100,000 or more showed profits.

Bell (2) reported a study of Montana elevators for the crop years of 1925, 1926, and 1927. He made his study on the basis of expense per bushel handled. He states that

cost per bushel exceeds 6 cents in ordinary seasons when less than 100,000 bushels of grain is handled. He also states that this cost drops to 2 cents per bushel when the volume is above 500,000 bushels. Bell also states that depreciation reserves and surpluses should be built up to provide for the deterioration of the physical plant, part of the operating capital, and emergencies of the business. Bell further states that, although volume is an important factor in efficient operation, it is not the only thing to consider. He lists efficiency of the manager, the type and arrangement of the elevator building, along with volume, as factors governing the expense per bushel of grain.

Benton and Peightal (3) studied 422 North Dakota farmers' elevator records during the seven years 1919-1925. They used only those associations on which there was a five-year record. They state that cost of handling grain varies with the production or the volume handled. In years of large production, grain is marketed locally at a lower cost per bushel than in years of small production. In this study, the 1924 production was the largest, and the average handling expense per bushel was 3.19 cents. The smallest crop was in 1919, and the average expense per bushel was 6.51 cents. Benton and Peightal show that the largest item of cost in operating farmers' elevators is labor. They

show that with North Dakota elevators 47.3 per cent of the total expense is for management and labor. They state that for each dollar spent for salary and labor the associations handling 50,000 to 100,000 bushels of grain had $43 of sales, while those handling more than 300,000 bushels had $88 of sale for each dollar spent for salary and labor.

Grinnell (10), in a study of Vermont creameries, states that salary and wages constituted the most important single item of expense, and that it was approximately one-third of the operating expense. Also in a study of six cooperative marketing and supply associations in which 90 per cent of the sales were feed and grain, he showed that, with an average business of $248,000, the operating costs were 4.3 cents per dollar of sale. Fifty per cent of this operation was for salary and labor.

Donaldson and Hemphill (4) summarized the financial records obtained from a survey of 24 farmers' elevators in northwestern Colorado. They state that the salary and labor expense constituted over 50 per cent of the total expense. They further state that, while management is probably more important, the average expense for management was less than the expense for additional labor during the two years included in the study. They list depreciation as the next largest item of expense. They did not make any allo-

cation of expense between grain and sidelines, but they suggest that most managers divide the expense on the basis of the ratio of sales of sidelines to the sales of grain. They suggest 175,000 bushels of grain as a minimum volume for safe operation.

Price and Arthur (14), in a study of 109 farmers' elevators in Minnesota for the period 1917-1923, state that farmers' elevators are affected by changes in the business cycle in much the same manner as other business enterprises. In periods of rising prices profits are larger and costs lower. In periods of falling prices costs are larger and profits lower. They show that in the period of falling prices, 1920 to 1922-23, as margins dropped with falling prices farmers' elevators reduced expenses in an attempt to adjust to fluctuating prices. They show that there is an apparent lag in adjusting expenses to prices. They show that the highest expense per bushel was in 1919-20 with high prices, then with dropping prices they compare 1918-19 to 1922-23, two years with approximately the same volume but still expenses were one-half cent per bushel higher in 1922-23 than 1918-19. Price, in discussing the relation of salary to profit, showed that the larger the salary the larger the net income. With a salary range of $750 to $1000, the associations showed an average loss of $50. As-

sociations paying $2500 or more for management showed a net income of $5660.

Post (13) made an analysis of the business practices and results of operation of 26 South Dakota farmers' elevators for the 10-year period 1921-1931. He studied the operations of each association by calculating ratios for all the comparisons. These were then averaged by groups having a certain volume. He divided his study into two sections. First, the records were divided on the basis of the business as a whole, and comparisons were made with dollars of sales as the measure of volume. Second, the associations were divided and studied on the basis of the volume of grain handled. He points out that farmers' elevators in that section must expect a wide variation in the amount of grain to be handled. When large crops are in prospect, efforts must be made to do the job efficiently. When small crops are in prospect, the problem is primarily one of curtailing the expenses while, at the same time, rendering the necessary services. While Post discusses his observations from the standpoint of dollar of sales for the business as a whole, he indicates there is a close relationship between dollars of sales and bushels handled. He has partly accomplished this by taking the volume in bushels, multiplied by the 10-year average price for his volume of dollar sales,

and has not attempted to show the variation in expense and margin per dollar of sales with the variation in prices from year to year.

Green and Ballow (8) analyzed 189 Kansas elevator records of grain-handling organizations for 1921 and 1922. Their study included mills, independent elevators, elevator lines, independent cooperative elevators, and cooperative line elevators. Their conclusions for handling charges were based on cost per bushel. Green and Ballow state that the volume of grain produced varies to a greater extent than the total cost of elevator operation. They showed that the average volume of grain handled per elevator varied from 13.2 per cent below to 18 per cent above the three-year average, while average costs per elevator varied from 8.4 per cent below to 12.3 per cent above the three-year average. Thus, the risk arising from the fluctuations in size of the wheat crop is, according to Green and Ballow, the most important cause affecting the cost per bushel of wheat handled at local elevators. Green and Ballow further pointed out that 70 to 75 per cent of the total cost of operation for these elevators were fixed costs which could not be changed easily and that 96 per cent or more of the fixed costs were made up of salary and labor, buildings, and equipment. This leads to the statement by Green and Ballow that "Reduction in

fixed costs aside from the influence of volume of grain handled is, therefore, largely dependent upon ability to cut or adjust salaries and wages."

Green (6), in his study of cooperative elevators in Kansas, divided the state into three districts: Eastern, which covers approximately the eastern one-third of Kansas; Northwestern, which is the northern half of the state west from the Eastern District; and Southwestern, which is the southern half of the state west of the Eastern District. Thus his Southwestern District is comparable to the area included in the present study. He states that the volume of grain handled is only one measure of the volume of business done by a local cooperative elevator. In certain sections it would be a very imperfect measure because the elevators handle more of other commodities than they do grain. He shows that in southwestern Kansas, 50 to 60 per cent of the large volume of grain elevators and 35 to 40 per cent of the small volume of grain elevators handle enough sideline sales so that the gross income from sideline sales covers 40 per cent or more of the total expenses.

Green suggests that the cost of allocating expenses is so tedious and expensive that the elevator may not be able to justify the expense from a practical standpoint. In these cases he suggests the use of dollar of sales basis as

the method of measuring margins and expenses. He further points out that because expenses do not vary with price but with the units handled, the expense per dollar of sales will vary with the price level. He shows that the highest expense per dollar was in 1932, a year of extremely low prices, and that in 1934 when prices were near or above the 1930 levels, expense per dollar had again fallen to reasonable limits.

Green points out that volume of grain handled also has an effect on an association's ability to make profit, and states that "The risk of loss was particularly high for elevators having a grain volume of less than 100,000 bushels per year and who handled grain on a gross margin of less than five or six cents per dollar of sale, even when prices were high and expenses had been reduced."

Green and Ballinger (7), in a study of 77 farmers' cooperative elevator associations in Oklahoma, obtained results quite similar to the report of Green (6) on cooperative elevators in Kansas. They point out that, while 59 per cent of the small volume elevators showed some profit, in 84 per cent of the cases the profit was limited to a range of less than $500 to $2,500. Less than half of the large volume elevators were thus limited. They point out in the Oklahoma associations that operating expense per dollar of

sales in 1931 and 1932, when prices were falling, ranged from 10 to 20 cents for elevators handling less than 100,000 bushels of grain, and 3 to 10 cents for elevators with larger volumes. They also state that in 1933 and 1934, after prices had advanced, handling expenses per dollar of sales ranged from 5 to 10 cents for small volume houses, and from 2 to 5 cents for those of larger volume sales.

Green and Rucker (9), in their study of cooperative elevators in Kansas for 1930, divided the records into three groups: (1) Those showing a net profit of $1,100 or less per year; (2) Those showing a net profit between $1,100 and $9,000 per year; and (3) Those showing a net profit of $9,000 or more per year. Their study pointed out that there is a definite relationship between net profit and the margin taken per dollar of wheat bought. In the low income group, only 45 per cent of the records had a margin of at least 4 cents per dollar of wheat bought; while there were 57 per cent of the medium profit group had gross margins of at least 4 cents per dollar of wheat bought; and in the high profit group 84 per cent showed margins of at least 4 cents per dollar of wheat purchased.

Mather (11), in an unpublished study of sidelines and their effects on net operating profits of Kansas cooperative elevators, states in regard to those in southwestern Kansas:

(1) That the decline in wheat prices was much more severe during this period than the decline in the prices of sideline commodities; and (2) That the gross profit on sideline sales was equal to approximately 50 per cent of the total gross profit, while it was also equal to about 60 per cent of the expense of southwestern Kansas elevators. He further states that where southwestern Kansas elevators realized sufficient gross profit from sideline sales to cover 40 per cent or more of the elevator's total expense, the elevator had eight chances out of ten of realizing a profit, while those which did not obtain this amount had only three chances out of ten for a profit. Mather also points out that the average margin per dollar of wheat sales was wider in 1932, the year of extremely low prices, than in either 1930, 1931, 1933, or 1934.

DEFINITION OF TERMS

1. Audit - Audit refers to the audit made annually in December or June. All audits cover the crop for the current year, i.e., a December, 1930 audit and a June, 1931 audit are classed together as they cover the same crop season.
2. Crop Year - Crop year is the period, July to June inclusive, covered by the audit.

3. Operating Expense - Operating expense includes total expense, depreciation when taken, and bad debts written off. It does not include interest on investment or capital stock.

4. Salaries and Wages - Salaries and wages include all labor except compensation to officers and directors.

5. Other Income - Other income includes interest and patronage dividends from the regional; income from storage, rent, and grinding; and collections of bad debts which had been written off.

6. Large Volume Elevators - Large volume elevators are those organizations which handled more than 150,000 bushels of grain during the year.

7. Small Volume Elevators - Small volume elevators are those organizations which handled 150,000 bushels or less of grain during the year.

8. Large Sideline Associations - Large sideline organizations are those which have sideline sales equal to 20 per cent or more of the gross sales.

9. Small Sideline Associations - Small sideline organizations are those which have sideline sales of less than 20 per cent of gross sales.

10. Elevator - Refers to one of the 35 associations on which there are five years of records.

11. Records or Cases - Refers to one or more of the 175 individual yearly records of the 35 elevator associations.

12. Depreciation - Used only when written off as reported by the auditor.

13. Sideline Sales - All sales except wheat. These elevators are located in primarily a wheat territory. Other grain was largely grain handled for retail which carries a credit risk and should have a sideline sale margin.

14. Total Net Income - Includes other income such as:
    (1) Patronage dividend on wheat from regional.
    (2) Storage due to wheat.
    (3) In early years, other income was not shown separate from total income on audit.

15. Expense Allocation - Expenses were used as total for entire business as there was no attempt in records obtained to allocate expense between wheat, storage, or sideline sales.

SCOPE AND METHOD OF PROCEDURE

This study was made on 35 cooperative elevator associations in southwestern Kansas for the five-year period 1930-1934 inclusive. The associations included in the study

were those on which business analyses had been conducted by the Extension Division and the Department of Agricultural Economics of the Kansas Agricultural Experiment Station, Manhattan, Kansas. The records of the elevators were obtained by personal visits to each elevator for each of the five years, and the information taken from the bonded auditor's report. These associations were all audited by a bonded auditor at least once each year. The records were placed under number in the files of the Department of Agricultural Economics, and served as the source of data for this study.

The 35 elevators used in this study are located in 13 southwestern Kansas counties, as shown by the list of elevators in Table 1 and also by the map in Figure 1 which designates their location. Surveys were made of all elevators in three counties--Pawnee, Stafford, and Gray. However, Gray County was not carried complete for all operating associations for the entire period.

The size of the sample was determined by the number of associations for which records were available for five consecutive years. Surveys were secured originally on 46 organizations, although only 35 were surveyed for the entire five-year period of this study. Eleven dropped out of the survey for one or more of the following reasons: (1) Closed

Table 1. List of Elevators by Number and County, with Capacity per Elevator.

Elevator Number	Capacity of Elevator	County
1	14,000 bu.	Stafford
2	25,000	Stafford
4	16,000	Stafford
6	18,000	Stafford
7	17,000	Stafford
9	17,500	Stafford
10	15,000	Pawnee
11	25,000	Pawnee
12	30,000	Pawnee
13	110,000	Pawnee
14	20,000	Pawnee
15	15,000	Pawnee
16	112,000	Gray
19	15,000	Gray
20	50,000	Gray
22	35,000	Gray
23	115,000	Meade
25	20,000	Ford
26	51,500	Ford
27	17,000	Reno
28	15,000	Reno
31	25,000	Reno
32	10,000	Hodgeman
33	15,000	Edwards
34	23,000	Rice
35	48,000	Comanche
36	28,000	Barton
37	17,000	Ellsworth
38	55,000	Ellsworth
39	28,000	Edwards
41	9,000	Barton
42	152,500	Meade
43	290,000	Meade
44	55,000	Ford
46	47,000	Kiowa

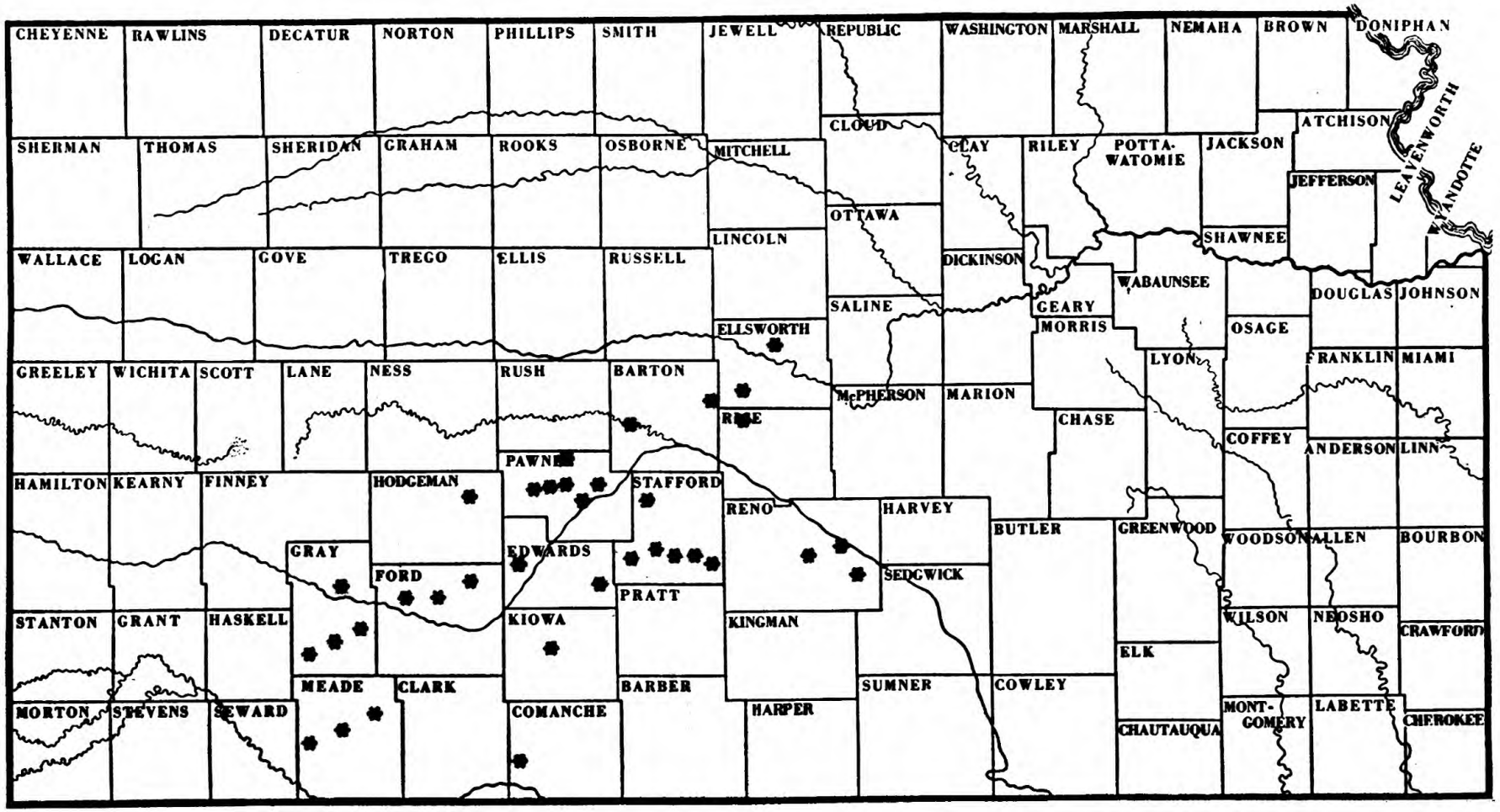

Figure 1. Map Showing Location of Elevators Used in the Study.

and stopped operating; (2) Elevator burned and was not rebuilt; (3) The board of directors or the manager did not want to continue the survey.

The total sales of all commodities, total expenses, and total profit, together with the total bushels of grain handled, were secured from the balance sheet and from the profit and loss statements for each of the associations for five years. From these data the expense per dollar of sale, the profit or loss per dollar of sale, and the margins per dollar of sale were figured.

Averages were used to designate general trends, but most comparisons were made from arrays of expenses, labor costs, and profit or loss per dollar of sales.

Comparisons were made by arraying the expense per dollar of sales from the smallest to the largest. These were worked first for the entire group of 175 records. Comparisons were then made from the array with the records divided into large volume and small volume groups. The small volume associations were those which handled 150,000 bushels or less per year. The large volume associations were those where more than 150,000 bushels of grain were handled per year. Arrays were then made and comparisons shown on a year to year basis.

Comparisons on the same basis were made from the array of labor cost per dollar of sales. This comparison of labor costs as the largest single expense item was used to show the changes made in costs to meet the variation in margins with varying price level for commodities handled. This one item made up approximately 50 per cent of the total expense in all the records.

Similar comparisons were made on the amount of profit or loss per dollar of sales. These were made first for all records, then on a yearly basis, and later in relation to small and large volume records.

A brief summary of the trend of sideline sales in relation to grain sales was included. The sale of petroleum products was used as a measure of the permanency of sidelines as this sideline requires a facility investment which should lead to a permanent sideline.

Characteristics of Southwestern Kansas Elevators

Only records of cooperative elevators of southwestern Kansas were used in this study because: (1) The records were available over a longer period of consecutive years than anywhere else in the state. (2) The average sized facility is larger in this territory than in any other territory in the state. (The size of house measured in stor-

age capacity is shown in Table 1.) (3) It is predominantly a wheat-producing territory with practically no other grain handled except that which is retailed and which can be classified as sideline sales since there are retail handling charges and credit risks. (4) The average sized farm in this territory is larger than in other sections of the state. Green and Rucker (9) state that 10.8 per cent of the farmers control 34.7 per cent of the wheat produced in the Dodge City territory. In the present study, four counties were in the Dodge City territory comparison and only one in the Salina territory comparison. (5) The large facility investment in this section is due partly to an attempt to own storage cooperatively instead of individually on the farm. (6) All the associations in this study own stock in some regional cooperative organization. All but two own stock in the Farmers Cooperative Commission Company at Hutchinson, Kansas; sixteen own stock in two cooperative regionals; and one holds stock in three such organizations. The fact that most of these are large houses resulted in practically all of them collecting storage on wheat during at least two of the five years. The patronage dividend received by these associations from their cooperative regional sales agency was also due to wheat handled. These two items made up most of the other income which was included

in the total income in the comparisons.

Fluctuations in Price and Volume During the Period

The volume of grain handled and the price per bushel has probably fluctuated more during this period than for any other period that these organizations have operated. These wide fluctuations have made comparisons difficult. On the other hand, it is interesting to study the various methods employed in making adjustments to such fluctuations.

The fluctuations in volume were from an extreme of 1,132,225 bushels handled by one association in 1931 to 51,000 bushels handled by the same association in 1934. These extreme fluctuations for the particular period under study, 1930-1934, as compared to the period since 1900 are shown by Figure 2, which shows that the average yield in these counties for the entire period was 12 bushels per harvested acre. In 14 of the 35 years, yields were above average, while in 21 years the yields were average or below. The fluctuations for the period under study range from the average of 12 bushels in 1930, to 20 bushels per acre in 1931, to 11 bushels per acre in 1932, and down to 7 bushels per acre in 1933. This low yield in 1933 was equalled only three times (1902, 1913, and 1925) since 1900. In 1934

the average yield was 9 bushels per acre. This meant that four of the five years were average or below, and that four of the 21 average or below average yields of the 35 years were in this period. The one year in this five-year period with above average yield was the highest yield for the entire 35-year period.

The price paid to the farmer fluctuated a great deal during the period 1900 to 1934, as shown by Figure 2. During this period the average price for wheat was 96 cents per bushel. This includes the five war years of extremely high prices. During this 35-year period there were 10 years in which the price was average or above and 25 years in which it was below average. In all five of the years included in the study the annual price was below average. Two of these years, 1931 and 1932, the price was the lowest ever recorded in this territory. The price and yield fluctuations are nearly opposite during this period. 1931 was a period of extremely high yield and extremely low prices. With a fall in yield per acre there was a corresponding increase in price. The fact that during this particular period the price was always below average and extremely low indicates that this period was the bottom of a major depression and the beginning of a recovery period.

The relationship between price and yield is shown by Figure 2 in which yield is indicated by the black line and price by the red line. This comparison indicates that over a period of years there is a wide fluctuation in yield. This points to the difficulty encountered by an association in planning for its fixed facilities. If the equipment is built to handle the crop in the years of extremely high yields, then adjustment to volume in years of small crops is difficult. If equipment is built on the basis of small crop years, then it may not be ample to handle the volume rapidly in years of large crops.

Fluctuations in yields are usually accompanied by some fluctuations in prices. This likewise necessitates adjustments in the margin per dollar of business. As price drops, margin per dollar apparently has to widen. The effect of these wide fluctuations of yield and price on local associations is indicated in Tables 2, 3, 4, 5, and 6. In these tables the records are arrayed for each of the five years from the small to the large expense per dollar of sales for the small volume elevators and the large volume elevators.

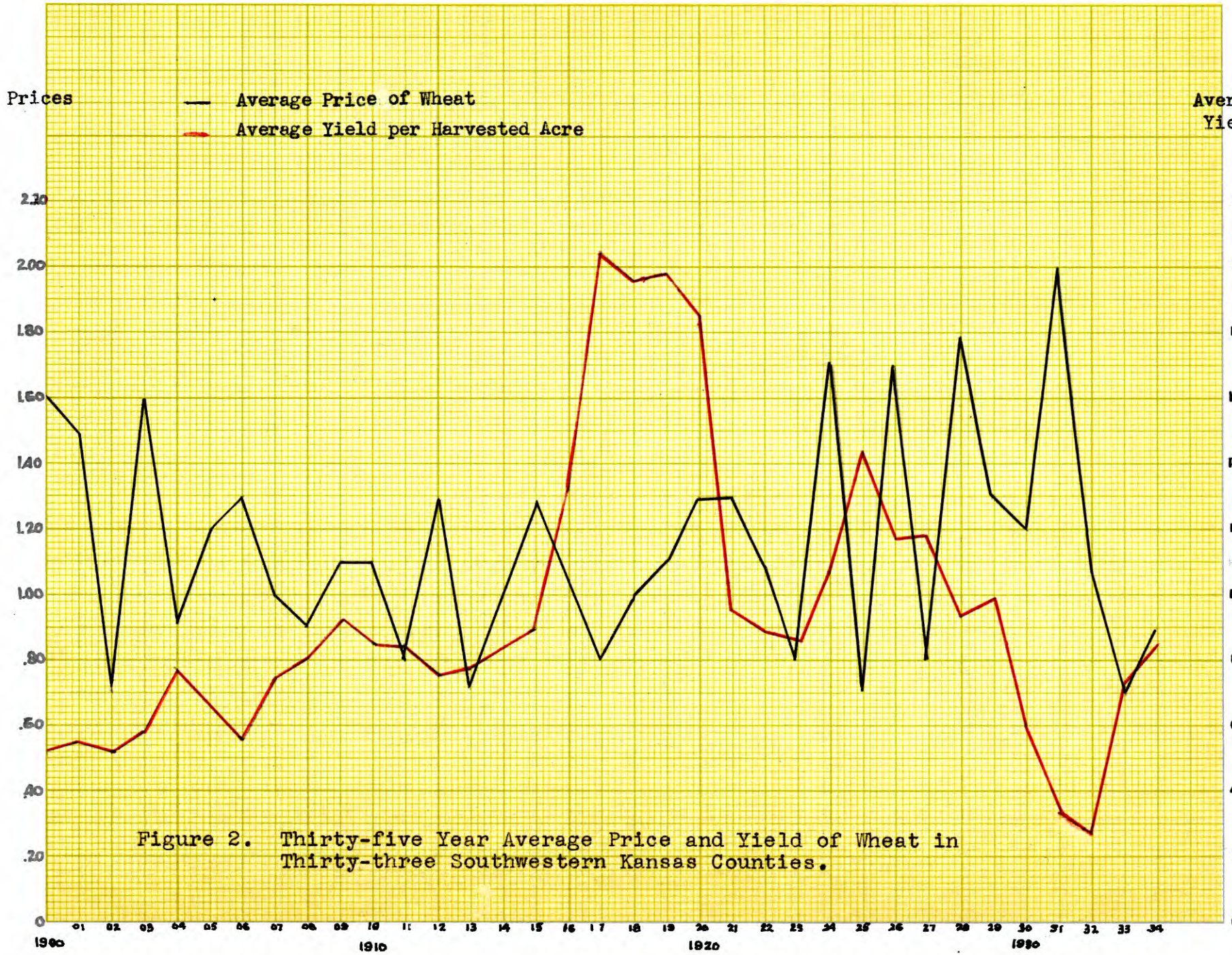

Figure 2. Thirty-five Year Average Price and Yield of Wheat in Thirty-three Southwestern Kansas Counties.

Table 2. Thirty-five Elevator Records Arrayed as to Expense per Dollar of Sales within the Small and Large Volume Groups for 1930.

Elevator Number	Expenses Per Dollar of Sales	Volume of Grain Handled	Capacity of Elevator
Small Volume Elevators (150,000 bu. or less)			
31	3.2	90,000	25,000
36	3.9	138,000	28,000
41	5.2	96,000	9,000
2	5.7	129,283	25,000
33	6.2	120,000	15,000
34	6.4	138,000	23,000
Average	5.1	118,547	
Large Volume Elevators (More than 150,000 bu.)			
27	1.3	319,500	17,000
1	1.6	346,500	14,000
23	1.9	628,500	115,000
9	2.0	237,000	17,500
46	2.1	508,500	47,000
22	2.6	455,000	35,000
43	2.6	633,000	290,000
32	3.0	249,000	10,000
16	3.1	822,943	112,000
14	3.2	318,000	20,000
6	3.5	246,000	18,000
39	3.6	160,000	28,000
25	3.7	330,000	20,000
12	4.1	295,500	30,000
7	4.1	352,500	17,000
35	4.1	520,977	48,000
37	4.2	211,985	17,000
15	4.3	226,500	15,000
19	4.4	219,000	15,000
11	4.4	296,500	25,000
44	4.5	528,147	55,000
28	4.7	226,500	15,000
4	4.7	384,095	16,000
10	4.7	470,000	15,000
20	5.6	291,000	50,000
26	5.8	324,000	51,500
13	5.8	567,000	110,000
42	6.5	351,000	152,500
38	7.5	226,500	55,000
Average	3.9	370,522	

Table 3. Thirty-five Elevator Records Arrayed as to Expense per Dollar of Sales within the Small and Large Volume Groups for 1931.

Elevator Number	Expenses Per Dollar of Sales	Volume of Grain Handled	Capacity of Elevator
Small Volume Elevators (150,000 bu. or less)			
33	5.9	150,000	15,000
31	6.5	120,000	25,000
37	7.5	148,000	24,000
2	10.5	123,678	26,000
Average	7.6	135,420	
Large Volume Elevators (More than 150,000 bu.)			
27	1.1	526,500	17,000
32	2.1	441,000	10,000
1	2.3	344,400	14,000
23	2.7	823,500	115,000
41	3.0	226,500	9,000
16	3.1	1,132,225	112,000
9	3.4	295,500	17,500
6	3.4	305,128	18,000
25	3.8	577,500	20,000
12	3.9	495,000	30,000
26	4.0	661,500	51,500
39	4.2	756,000	28,000
10	4.5	658,500	15,000
14	4.7	490,500	20,000
4	4.8	373,500	16,000
22	4.9	250,000	35,000
46	4.9	470,000	47,000
15	5.3	312,783	15,000
20	5.5	345,000	50,000
34	5.6	314,887	23,000
7	5.6	334,500	17,000
11	5.7	409,640	25,000
13	5.7	796,500	110,000
36	5.8	172,500	28,000
43	5.8	498,000	290,000
44	5.9	500,000	55,000
28	6.2	280,500	15,000
19	6.7	232,500	15,000
35	8.0	480,000	48,000
42	8.8	345,000	152,500
38	8.9	220,500	55,000
Average	4.8	453,857	

Table 4. Thirty-five Elevator Records Arrayed as to Expense per Dollar of Sales within the Small and Large Volume Groups for 1932.

Elevator Number	Expenses Per Dollar of Sales	Volume of Grain Handled	Capacity of Elevator
Small Volume Elevators (150,000 bu. or less)			
36	6.1	135,000	28,000
22	7.2	106,000	35,000
33	9.0	91,500	15,000
28	9.3	139,500	15,000
19	9.4	111,000	15,000
31	9.6	97,500	25,000
7	9.8	148,500	17,000
37	10.2	130,556	24,000
2	13.9	87,000	26,000
42	15.3	139,500	152,500
Average	9.9	118,606	
Large Volume Elevators (More than 150,000 bu.)			
27	1.5	415,000	17,000
16	1.7	280,298	112,000
32	3.1	195,000	10,000
25	4.4	420,000	20,000
9	4.6	259,500	17,500
1	4.6	240,000	14,000
20	4.7	174,000	50,000
23	4.8	562,500	115,000
41	5.4	159,000	9,000
15	5.6	280,500	15,000
39	5.7	603,000	28,000
10	6.1	373,666	15,000
13	6.1	723,000	110,000
6	6.2	178,500	18,000
12	6.2	313,500	30,000
14	6.5	346,500	20,000
34	7.1	250,500	23,000
4	7.2	306,000	16,000
26	8.8	407,000	51,500
38	9.7	265,500	55,000
11	10.0	173,000	15,000
43	11.5	253,500	290,000
44	13.3	259,500	55,000
35	13.5	189,000	48,000
46	18.4	310,000	47,000
Average	7.1	317,519	

Table 5. Thirty-five Elevator Records Arrayed as to Expense per Dollar of Sales within the Small and Large Volume Groups for 1933.

Elevator Number	Expenses Per Dollar of Sales	Volume of Grain Handled	Capacity of Elevator
Small Volume Elevators (150,000 bu. or less)			
1	4.7	77,448	20,000
36	5.0	108,179	19,000
31	5.8	48,560	25,000
26	5.8	117,000	65,000
4	5.9	99,450	16,000
12	6.1	123,624	30,000
11	6.2	100,500	15,000
25	6.5	109,458	20,000
20	6.6	38,997	15,000
10	6.6	144,130	15,000
28	7.0	93,650	13,000
14	7.1	144,528	20,000
9	8.1	67,436	15,000
41	8.2	74,000	10,000
15	8.5	93,931	15,000
16	8.6	82,500	100,000
2	9.4	44,756	25,000
6	11.4	40,930	18,000
7	11.4	49,684	17,000
19	11.6	25,860	15,000
32	11.9	54,700	10,000
22	12.1	19,200	17,000
44	16.6	31,000	55,000
33	16.9	14,230	15,000
42	16.9	68,000	152,500
43	18.9	36,000	237,000
Average	9.4	73,375	
Large Volume Elevators (More than 150,000 bu.)			
27	1.8	300,000	17,000
37	3.6	161,886	27,000
34	4.3	196,885	23,000
46	5.3	188,000	97,000
13	5.4	367,500	85,000
35	5.6	193,648	18,000
38	6.7	185,000	55,000
23	7.0	183,827	300,000
39	7.5	215,000	28,000
Average	5.2	221,305	

Table 6. Thirty-five Elevator Records Arrayed as to Expense per Dollar of Sales within the Small and Large Volume Groups for 1934.

Elevator Number	Expenses Per Dollar of Sales	Volume of Grain Handled	Capacity of Elevator
	Small Volume Elevators (150,000 bu. or less)		
1	1.7	129,283	23,500
36	3.0	150,000	19,000
2	3.2	94,500	25,000
31	3.3	93,858	25,000
41	3.7	76,000	10,000
39	4.2	150,000	28,000
15	4.3	96,500	15,000
6	4.5	111,211	18,000
11	4.7	144,110	15,000
16	4.8	51,000	100,000
7	5.5	84,931	17,000
33	6.3	45,000	15,000
35	6.6	109,600	18,000
19	6.8	39,000	15,000
25	6.9	86,000	20,000
26	7.2	85,000	65,000
46	7.3	87,000	97,000
20	7.7	42,621	15,000
32	7.8	48,000	10,000
43	8.7	70,000	237,000
22	8.9	29,000	17,000
42	11.8	83,734	152,500
44	13.6	89,134	55,000
Average	6.2	86,760	
	Large Volume Elevators (More than 150,000 bu.)		
27	1.2	436,892	17,000
37	2.3	234,790	27,000
34	2.6	335,258	23,000
9	2.9	176,081	15,000
28	3.0	178,500	31,000
12	3.2	216,751	30,000
23	3.6	230,726	300,000
14	3.7	209,169	20,000
4	3.8	189,700	16,000
10	4.0	250,872	15,000
13	4.2	435,000	85,000
38	4.6	276,030	55,000
Average	3.2	264,147	

These tables indicate that in 1930, six associations were in the small volume group--that is, they handled 150,000 bushels of grain or less, while 29 were in the large volume group of over 150,000 bushels. In 1931, only four associations were in the small volume group and 31 in the large volume group. In 1932, there were 10 associations in the small volume group and 25 in the large. In 1933, 26 associations were in the small volume group and 9 in the large volume group. In 1934, 23 associations were in the small volume group and 12 in the large volume group.

A study of the capacity of elevators in relation to grain handled shows the problem of attempting to adjust expense. The elevator capacity for each house remained practically the same throughout the period except that three of the large storage type plants increased their storage space in 1930 and 1931. In 1930, the six associations in the small volume group were relatively small-sized houses. This was true for the four associations in that group in 1931. In 1932, a few medium-sized houses were in the small volume group, while one association with a capacity of over 150,000 bushels capacity was in the small volume group. This particular association handled only 130,000 bushels of grain--that is, they were not able to fill their house once, where it is normally considered desirable to fill a house four to

ten times during the season, depending on the size of the house. In 1933, there were three associations in the small volume group with a capacity from 100,000 bushels to 237,000 bushels. This association with 237,000 bushel house handled only 36,000 bushels. This meant that 201,000 bushel space in the house was not used at any time during the year. In 1934, with 23 small volume associations recorded, the same three large houses were included.

This clearly indicates the hazard in over-equipping an association with a heavy investment in fixed facilities. The association having a capacity of 237,000 in a single house had the following bushel volume: 1930 - 633,000; 1931 - 498,000; 1932 - 233,500; 1933 - 36,000; and 1934 - 36,000. At no time did this association handle as much as three bushels for each bushel of capacity. Another association with a capacity of 100,000 bushels in one house handled the following bushels: 1930 - 822,943; 1931 - 1,132,223; 1932 - 280,298; 1933 - 82,500; and 1934 - 51,000. This association had the most extreme fluctuation, but showed more efficient use of capacity than the first. These two associations are definitely in the storage elevator class. A comparison with one of the smaller houses having a capacity of 15,000 bushels, where a turnover of ten times is necessary for efficient operation, is also made. This association

handled the following bushels: 1930 - 470,000; 1931 - 658,000; 1932 - 373,666; 1933 - 144,130; and 1934 - 250,872. This association shows very efficient use of fixed facilities.

This leads to the statement that there is danger of over-capitalizing in fixed facilities in a territory where crop yields fluctuate widely; however, by using the 35-year average yield and variation from that, the dangers are not quite so great as indicated in the period studied, as the fluctuation in yield is not so severe. With 21 of the 35 years below average, it seems hardly advisable to equip to handle more than an average crop.

TOTAL EXPENSES OF OPERATION PER DOLLAR OF TOTAL SALES

The operating expenses were arrayed from the smallest to the largest expense per dollar of sales for the entire group of associations for each of the five years included in this study. These comparisons were made on the dollar basis for this study because it was felt that, although it might be desirable to keep complete cost accounts and allocate the expense to grain and sidelines, from a practical standpoint of operation the effort is more than the benefit. With this in mind, these comparisons are made as an attempt to show the variation to be expected due to fluctuations in

price and volume. Comparisons were made on the expense per dollar of sales (1) in relation to margins and price fluctuations, (2) expense per dollar of sales in relation to volume of business, and (3) expense per dollar of sales and margin per dollar obtained in relation to profit or loss.

It should be remembered that in this section the expense per dollar of sales is measured in terms of total sales and total expenses. The five years under study represent years, as previously stated, of fluctuating prices and volume. The year 1930 was one of declining prices with an average yield per acre; 1931 was a year with prices declining to an extremely low level and the highest average yield on record; 1932 was a year of extremely low prices and with a yield only one bushel below average; 1933 was a year of advancing prices with the smallest average yield for the five years, and equaled only three other times in 35 years; and 1934 was a year with prices advancing to near average and a yield per acre higher than 1933 but lower than 1932.

Table 7 shows the array of total expense per dollar of sales for the total 175 records for the five-year period. Figure 3, the accumulated frequency chart, shows there were nine instances in which expense per dollar was less than 2 cents; nine cases more than 2 and less than 3; 26 cases over 3 and less than 4; 33 cases (which was the largest single

Table 7. Expense per Dollar of Sales for Thirty-five Elevator Associations Arrayed from the Smallest to the Largest Expense for Each of Five Years.

1930	1931	1932	1933	1934
1.3	1.1	1.5	1.8	1.2
1.6	2.1	1.7*	3.6	1.7
1.9	2.3	3.1*	4.3	2.3
2.0	2.7	4.4	4.7*	2.6
2.6	3.0	4.6*	5.0	2.9
2.6	3.1	4.6	5.3	3.0
3.0	3.4	4.7	5.4	3.0
3.1*	3.4	4.8	5.6	3.2
3.1*	3.8	5.4	5.8*	3.2
3.2	3.9	5.6	5.8	3.3
3.2	4.0	5.7	5.9	3.6
3.5*	4.2	6.1*	6.1	3.7
3.6	4.5	6.1	6.2*	3.7
3.7	4.7	6.1	6.5	3.8
3.9*	4.8	6.2*	6.6*	4.0
4.1	4.9	6.2	6.6	4.2
4.1	4.9	6.5	6.7	4.2
4.1	5.3	7.1	7.0*	4.3
4.2	5.4	7.2*	7.0	4.5*
4.3	5.6	7.2	7.1*	4.6
4.4	5.6	8.8	7.5	4.7*
4.4	5.7	9.0*	8.1	4.8
4.5	5.7	9.3*	8.2	5.5*
4.7	5.8	9.4*	8.5	6.3*
4.7	5.8	9.6	8.6	6.6
4.7	5.9*	9.7	9.4*	6.8
5.2*	5.9	9.8	11.4*	6.9*
5.6	6.2	10.0*	11.4*	7.2
5.7*	6.5*	10.2*	11.6	7.3*
5.8	6.7	11.5*	11.9*	7.7*
5.8	7.5*	13.3	12.1*	7.8*
6.2*	8.0	13.5	16.6	8.7*
6.4	8.8	13.9*	16.9*	8.9*
6.5	8.9	15.3	16.9*	11.8*
7.5	10.5	18.4*	18.9*	13.6

* Cases with loss for operations.

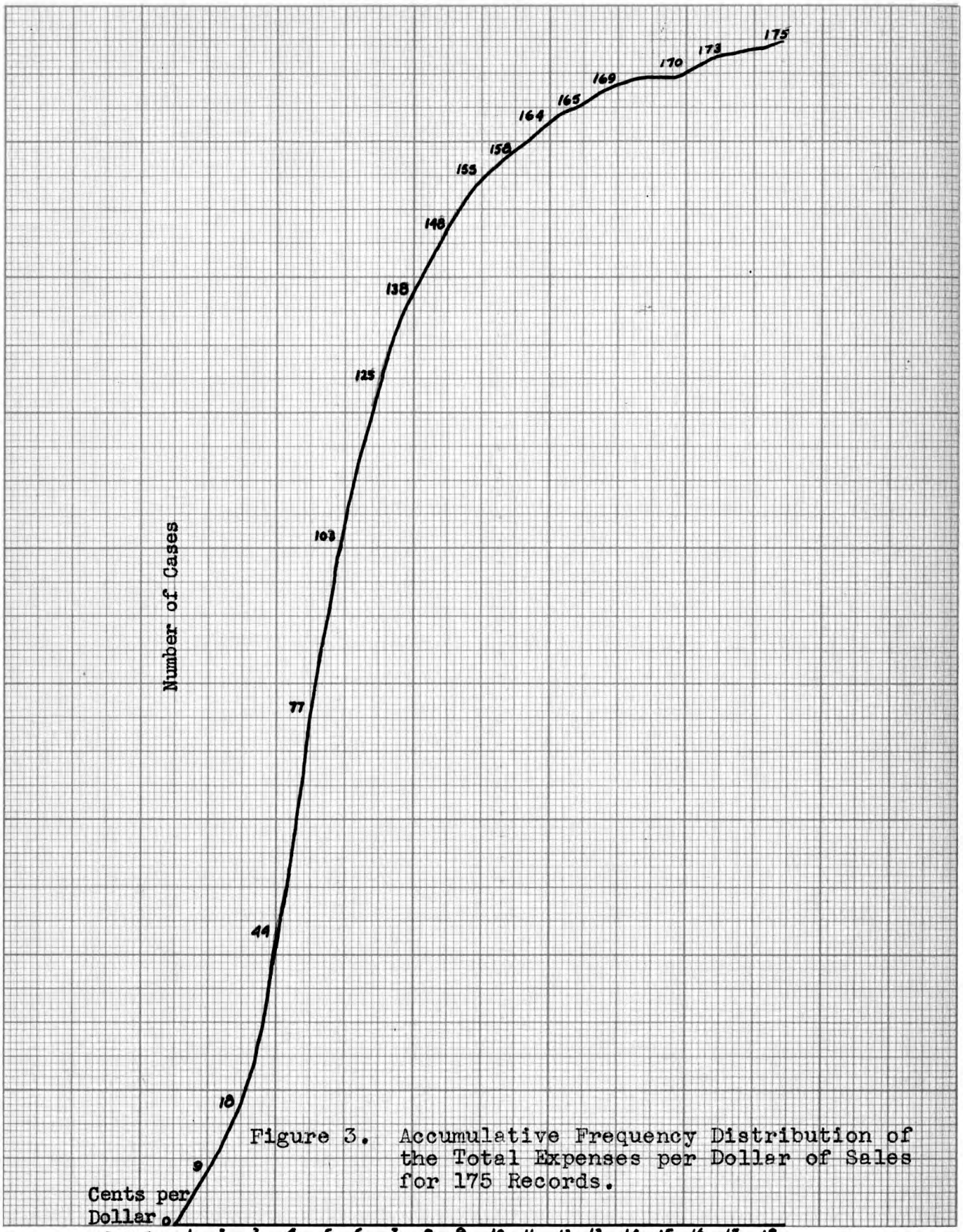

Figure 3. Accumulative Frequency Distribution of the Total Expenses per Dollar of Sales for 175 Records.

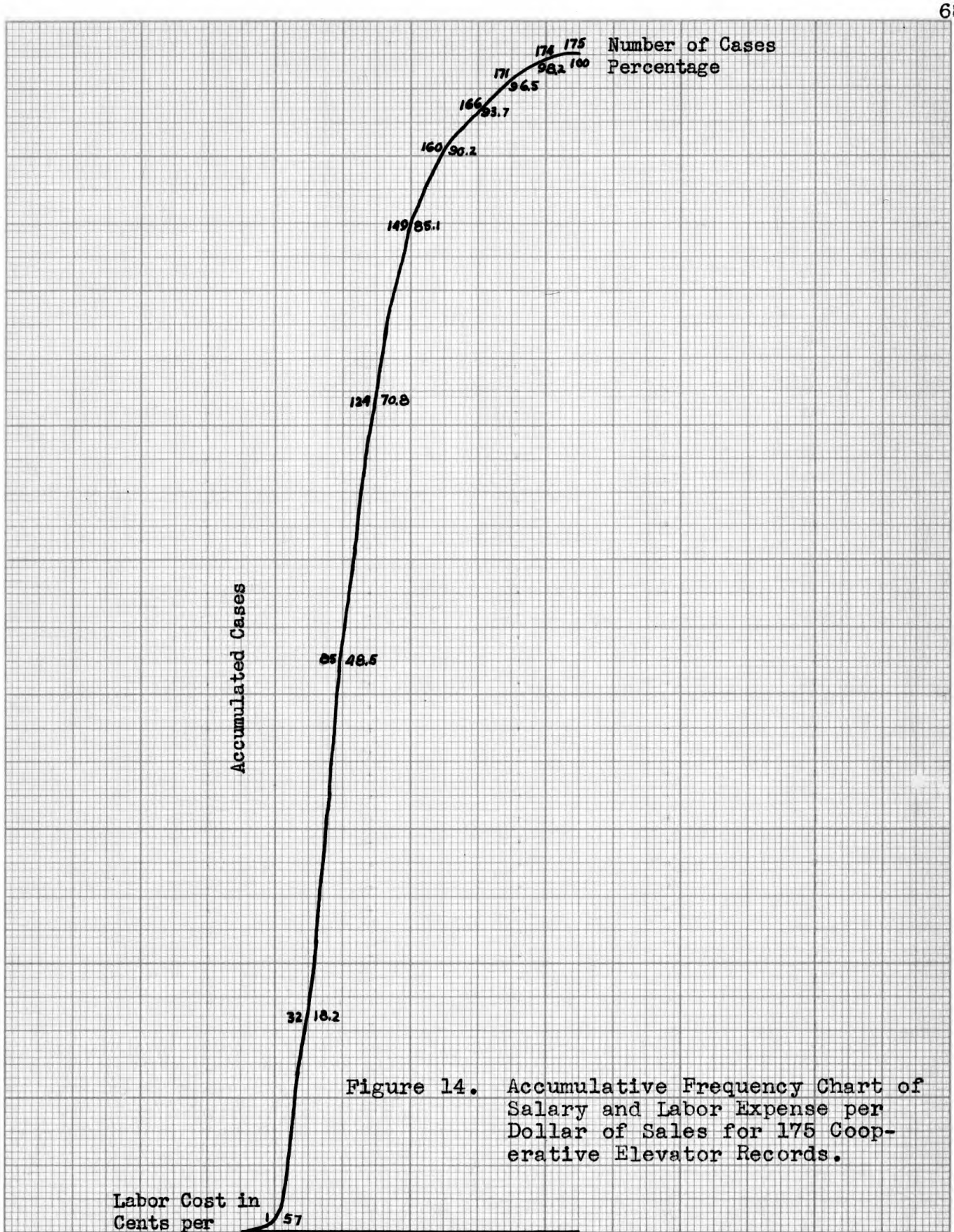

Figure 14. Accumulative Frequency Chart of Salary and Labor Expense per Dollar of Sales for 175 Cooperative Elevator Records.

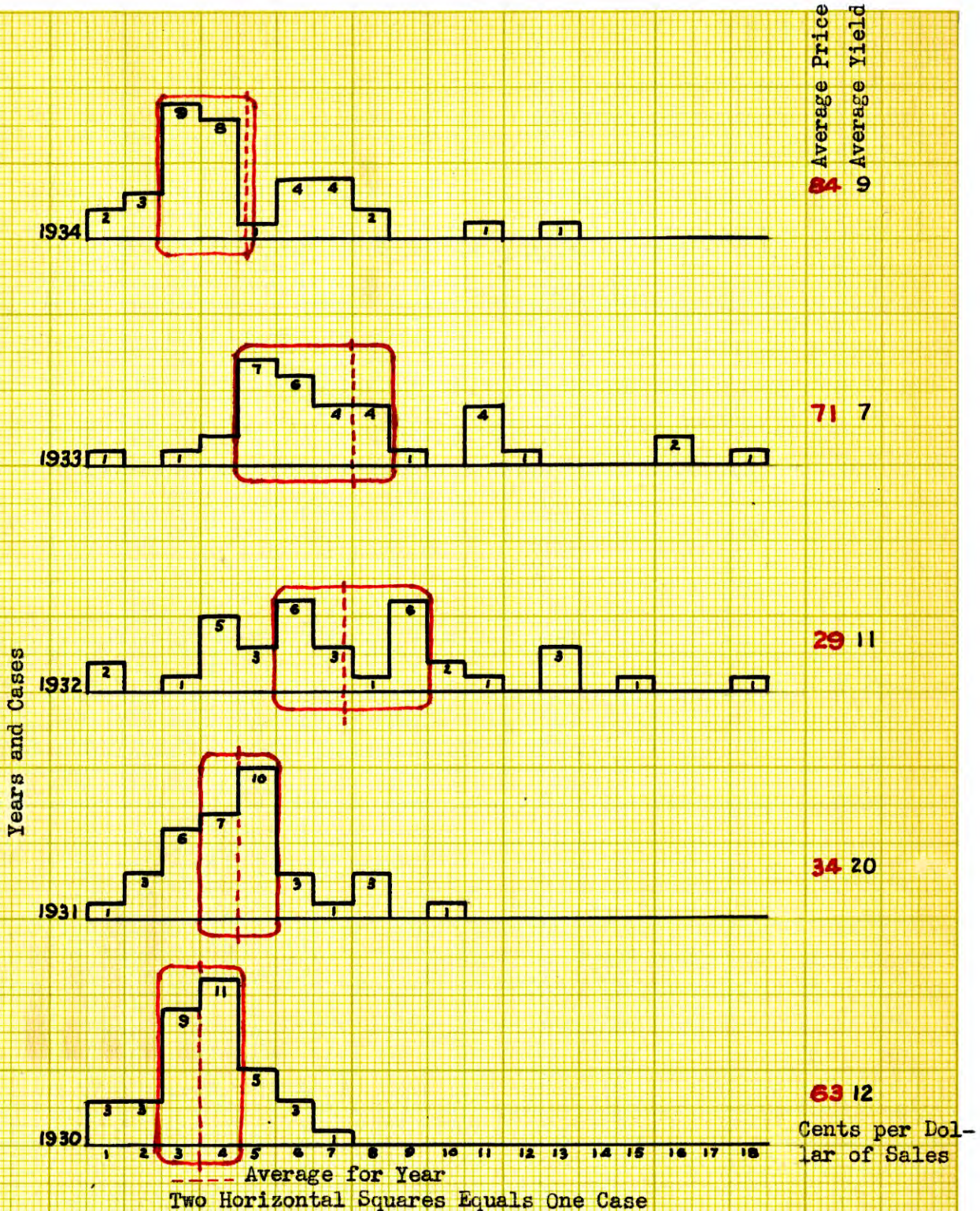

Figure 4. Frequency Distribution of the Total Expenses per Dollar of Sales for 35 Cooperative Elevator Records for Five Years with Fluctuations in Price and Volume.

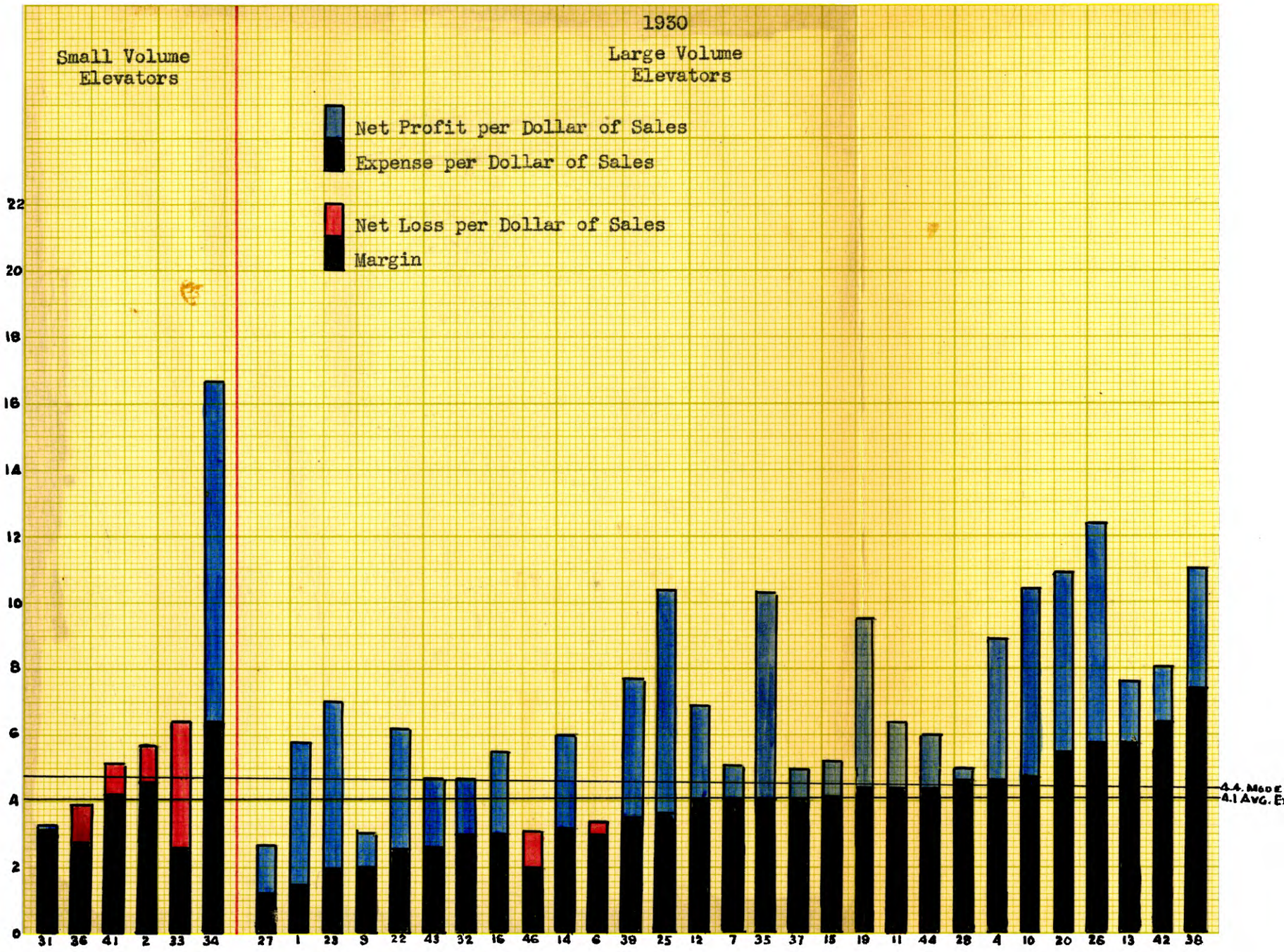

Figure 5. Margins, Profit, Loss, and Expenses per Dollar of Sales Arrayed by Expense per Dollar of Sales within Small and Large Volume Records for 1930.

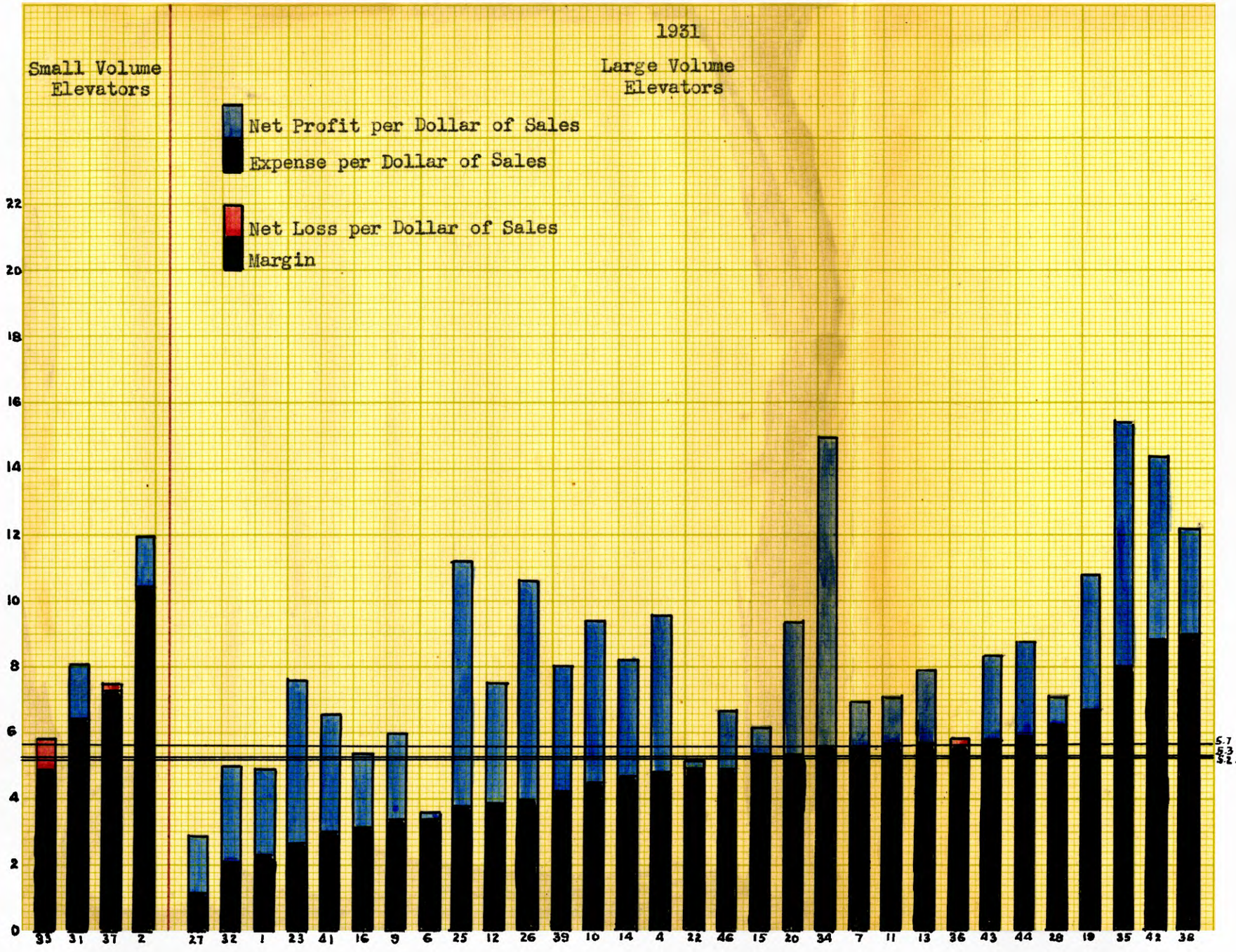

Figure 6. Margins, Profit, Loss, and Expenses per Dollar of Sales Arrayed by Expense per Dollar of Sales within Small and Large Volume Records for 1931.

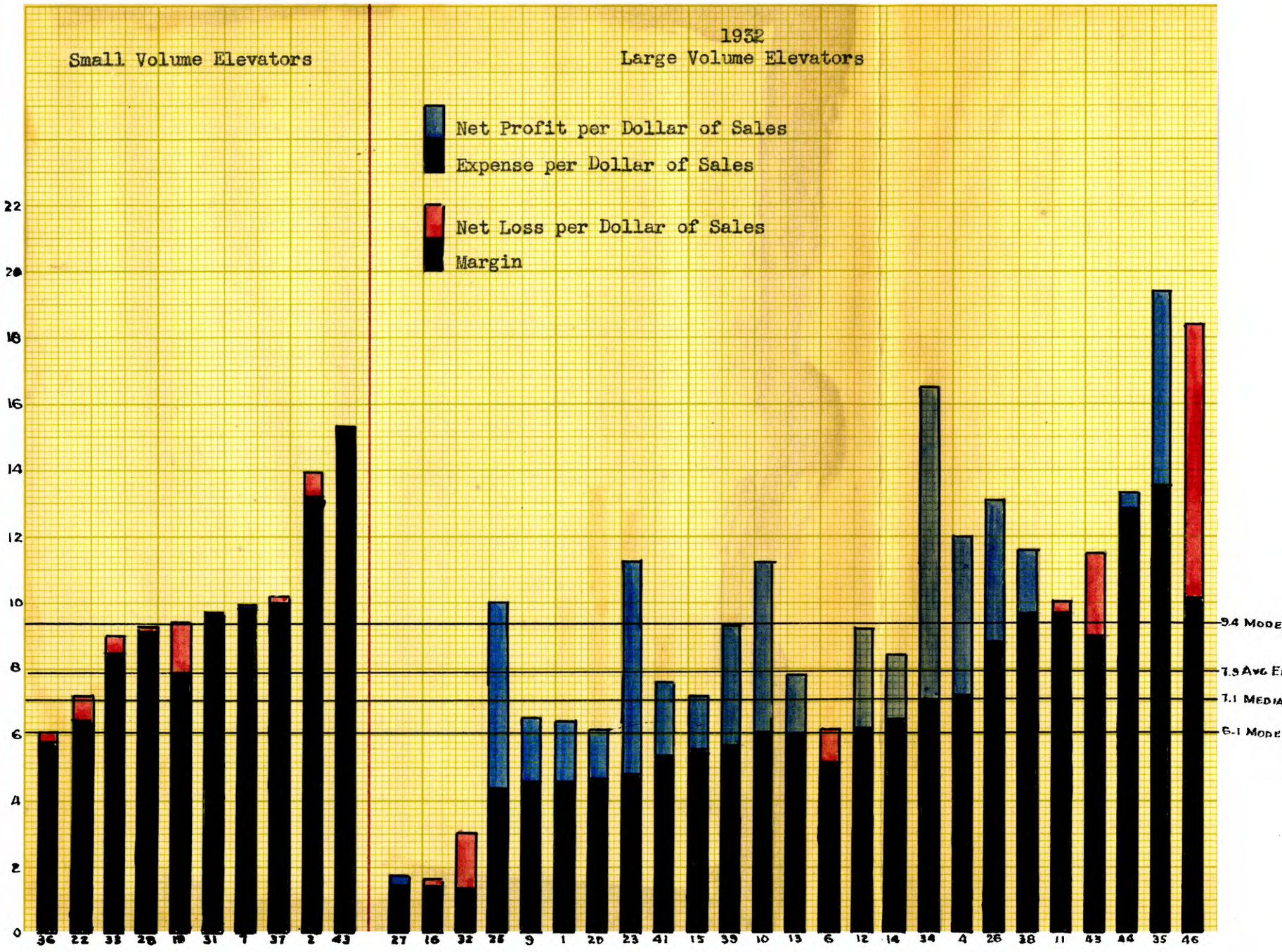

Figure 7. Margins, Profit, Loss, and Expenses per Dollar of Sales Arrayed by Expense per Dollar of Sales within Small and Large Volume Records for 1932.

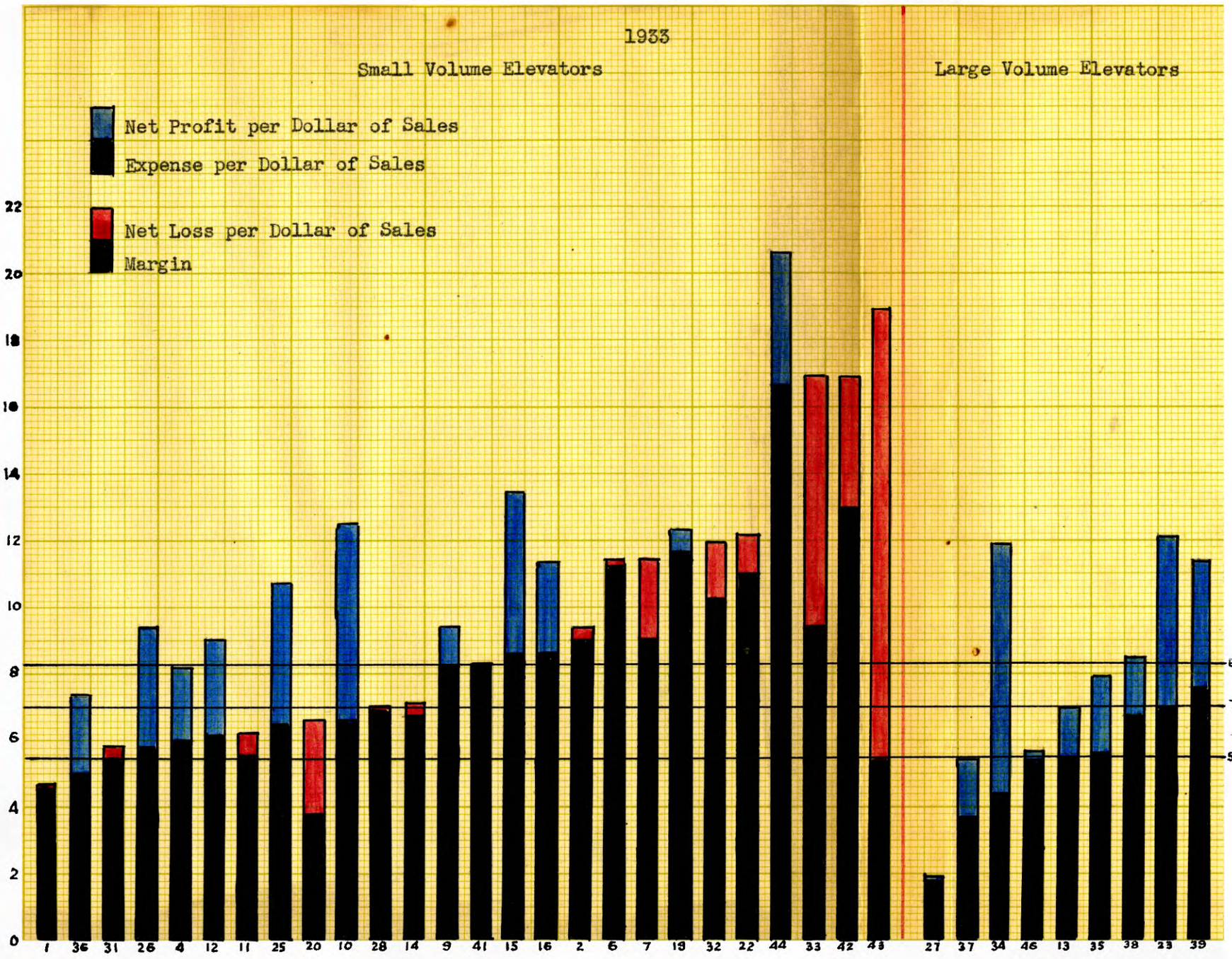

Figure 8. Margins, Profit, Loss, and Expenses per Dollar of Sales Arrayed by Expense per Dollar of Sales within Small and Large Volume Records for 1933.

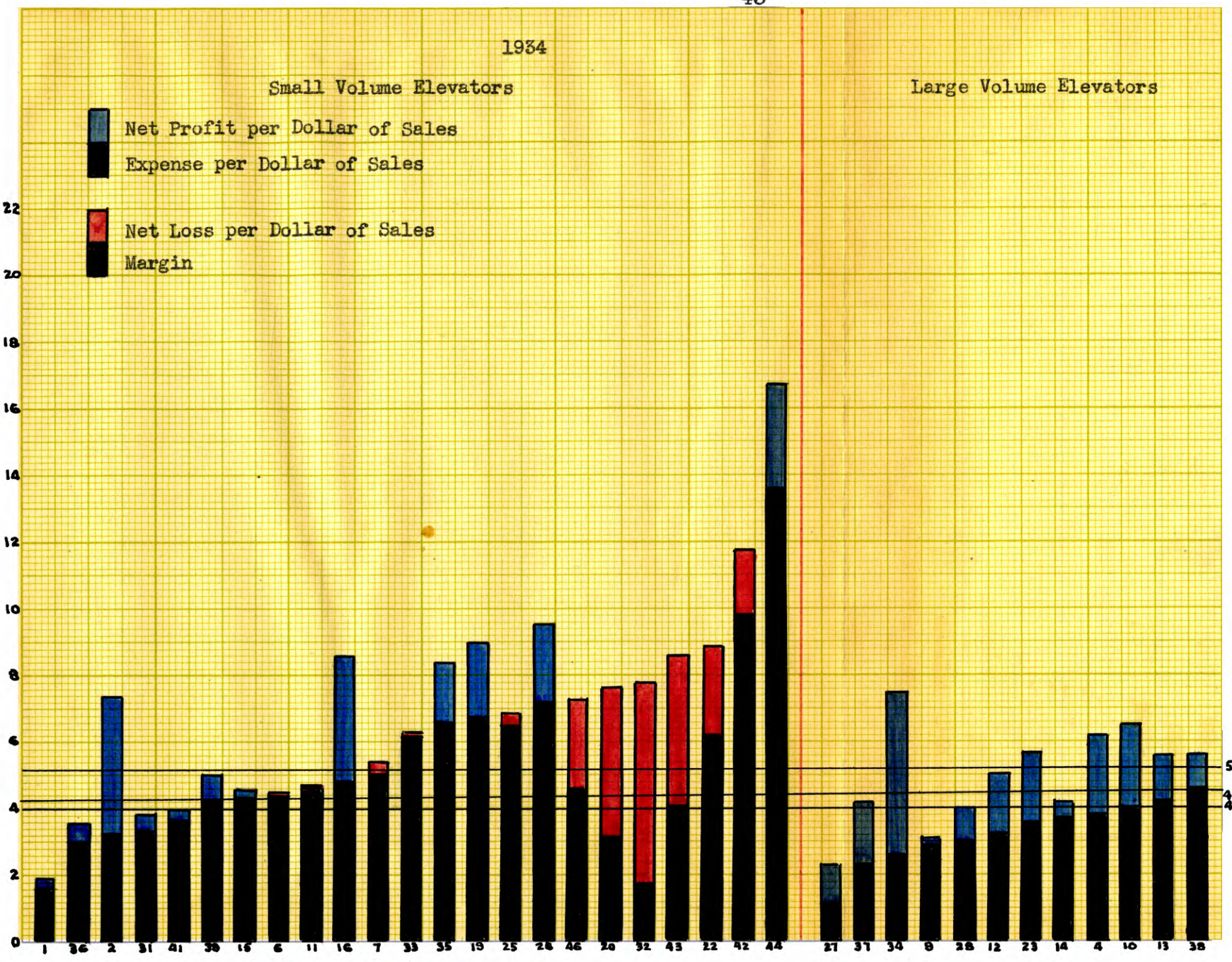

Figure 9. Margins, Profit, Loss, and Expenses per Dollar of Sales Arrayed by Expense per Dollar of Sales within Small and Large Volume Records for 1934.

Figures 5, 6, 7, 8, and 9 indicate division in small and large volume records and are made from the arrays on small and large volume operations as shown in Tables 2, 3, 4, 5, and 6 with the profit or loss added. The discussion of expenses per dollar of sales so far has disregarded profit or loss. In all cases if the margin taken per dollar of sales was larger than the expense per dollar of sales, then the association had a profit. If the margin taken was less than the expense, the association showed a loss. Margin comparisons were also taken into account in Figures 5, 6, 7, 8, and 9. These charts are made with each bar representing an individual record for each year. The total bar is the margin taken if a profit were shown. If a loss were shown, the total bar then becomes expenses per dollar of sales. The black portion of the bar is the expenses per dollar of sales in the profit records and the margin per dollar of sales in the loss records. The blue portion of the bar is the profit or margin over expenses per dollar of sales. The red portion of the bars indicates the loss per dollar of sales or the expenses over margins taken. The average expense per dollar of sales is also shown on these charts as well as the median and the mode. This shows quite distinctly that the average expense may not be relied upon to indicate margins, profits, or expense.

For two years, 1930 and 1931, the average is a good measure with both the median and mode being very close. In 1932, with extremely low prices, expenses had not yet been adjusted in some cases. The average and the median fall fairly close together, but there appears to be virtually two modal groups--one at 6.1 cents of expense per dollar and one at 9.4 cents expense. The modal group with 9.4 cents expense of sales per dollar was in the small volume group of records, while the 6.1 modal group was in the group of records where over 150,000 bushels of grain were handled per elevator.

In 1933, the average was higher than both the median and mode, although there was not an apparent division into two modal groups. This year, as in 1932, the larger cost per dollar was in the small volume elevators. The average was 8.3 cents per dollar of sales with a median of 7 cents. There was only one large volume elevator which showed an expense per dollar of more than the median. The modal point for 1933 was 5.5 cents per dollar of sales. The higher average cost was due probably to several large sized houses being forced over into the small volume group due to a short crop year. There were three of the five houses of over 100,000 bushels of capacity in this small volume group in 1933. One of these houses showed a profit while within the

small volume group. In 1934, with prices rising again to near average levels, expenses adjusted and a higher average yield, the average expenses per dollar, the median, and the mode were again fairly close together with the mode being the lowest of the three. This would indicate that on the average most of the associations had expenses per dollar well in hand, although a few in the low volume group had extremely high expenses. Again in 1934 there were three out of the five houses with over 100,000 bushels capacity in the small volume group, two of which showed high expense per dollar and the third showed a profit with less than average expense per dollar as in 1933.

Figure 3 shows quite clearly this variation of expense per dollar throughout this period in the number of cases falling within certain expense costs if 50 per cent of the cases or more are used within each year. In this case the average has fallen within this grouping. In 1930 the grouping was 3 cents and under 5 cents expense per dollar of sales; in 1931, 4 cents and less than 6 cents; in 1932, 6 cents and less than 10 cents; in 1933, 5 cents and less than 9 cents; and in 1934, 3 cents and less than 6 cents.

This would indicate that: (1) As price per bushel of grain goes down, expense per dollar of sales goes up, shown by highest expense during 1932 with the lowest price.

(2) As price per bushel increases, expense per dollar tends to decrease. (This was shown by Green (6) in comparing expense per dollar for Kansas elevators in 1930-31 and 1932-33.) (3) Volume also affects expense per dollar of sales. In 1931, a year with an extremely high yield and a price of 29 cents per bushel less than 1930 and only 5 cents per bushel more than 1932, 50 per cent of the records had an expense per dollar between 4 and 6 cents. In 1932, a year of the lowest price and a yield per acre of only one bushel less than average, 50 per cent or more of the records had an expense per dollar of sale between 6 and 10 cents--the highest for the period. In 1933, with a price per bushel of 42 cents higher than in 1932 and 12 cents less than in 1930, but with a yield of 7 bushels per acre, 50 per cent or more of the records had an expense range from 5 to 9 cents per dollar. This would indicate that even with an increase in price, the small total yield maintained higher costs per dollar than otherwise would be expected. This is indicated by the records of 1934, a year in which the yield increased 2 bushels per acre from 1933 but was still 3 bushels below normal and was accompanied by a price level 13 cents above 1930. On this basis, 50 per cent or more of the records had an expense per dollar of sales between 3 and 5 cents, which was the same as the 1930 range of expense

dollar of sales.

Table 8. Expenses per Dollar of Sales for Small and Large Volume Records.

Year	Small Volume Records: Total Records	Small Volume Records: Median 7 cents per dollar of sales: Below 7 cents	Small Volume Records: Median 7 cents per dollar of sales: Above 7 cents	Large Volume Records: Total Records	Large Volume Records: Median is in center of 4.6 Division made at 4.7: Below 4.7 cents	Large Volume Records: Median is in center of 4.6 Division made at 4.7: Above 4.7 cents
1930:	6	6	0	29	20	9
1931:	4	2	2	31	13	18
1932:	10	1	9	25	6	19
1933:	26*	10	15	9	3	6
1934:	23	15	8	12	12	0
Total:	69	34	34	106	54	52

* One case at median.

Table 9. Instances in Which Expenses per Dollar of Sales Were Less Than 3 Cents.

Year	Total number of elevators	Expenses Less Than 3 Cents Per Dollar of Sales: 150,000 bu. of grain or less	More than 150,000 bu. of grain	Total	Per cent of total number of elevators
1930:	35	0	6	6	17.1
1931:	35	0	4	4	11.4
1932:	35	0	2	2	5.7
1933:	35	0	1	1	2.5
1934:	35	1	4	5	14.2
Total:	175	1	17	18	10.2

Table 10, with the division made at 4 cents per dollar of sales which is close to the median of the large volume group, shows only seven instances where the small vol-

dollar of sales.

Table 8. Expenses per Dollar of Sales for Small and Large Volume Records.

Year	Small Volume Records: Total Records	Small Volume Records: Median 7 cents per dollar of sales: Below 7 cents	Small Volume Records: Median 7 cents per dollar of sales: Above 7 cents	Large Volume Records: Total Records	Large Volume Records: Median is in center of 4.6 Division made at 4.7: Below 4.7 cents	Large Volume Records: Median is in center of 4.6 Division made at 4.7: Above 4.7 cents
1930:	6	6	0	29	20	9
1931:	4	2	2	31	13	18
1932:	10	1	9	25	6	19
1933:	26*	10	15	9	3	6
1934:	23	15	8	12	12	0
Total:	69	34	34	106	54	52

* One case at median.

Table 9. Instances in Which Expenses per Dollar of Sales Were Less Than 3 Cents.

Year	Total number of elevators	Expenses Less Than 3 Cents Per Dollar of Sales: 150,000 bu. of grain or less	Expenses Less Than 3 Cents Per Dollar of Sales: More than 150,000 bu. of grain	Expenses Less Than 3 Cents Per Dollar of Sales: Total	Per cent of total number of elevators
1930:	35	0	6	6	17.1
1931:	35	0	4	4	11.4
1932:	35	0	2	2	5.7
1933:	35	0	1	1	2.5
1934:	35	1	4	5	14.2
Total:	175	1	17	18	10.2

Table 10, with the division made at 4 cents per dollar of sales which is close to the median of the large volume group, shows only seven instances where the small vol-

ume associations had expenses of less than 4 cents per dollar. There were 37 cases of the large volume records with expenses of less than 4 cents. With the median of this group at 4.6 cents and 17 cases appearing between 4 and 4.7 cents, expenses indicate close grouping of the large volume expense groups.

Table 10. Instances in Which Expenses per Dollar of Sales Were Less Than 4 Cents.

Year	Total number of elevators	Expenses Less Than 4 Cents Per Dollar of Sales: 150,000 bu. of grain or less	More than 150,000 bu. of grain	Total	Per cent of total number of elevators
1930	35	2	13	15	42.8
1931	35	0	10	10	28.5
1932	35	0	3	3	8.5
1933	35	0	2	2	5.7
1934	35	5	9	14	40.0
Total	175	7	37	44	25.1

Table 11 shows 34 instances in which small volume groups had expenses of more than 7 cents per dollar of sales. This is the exact median for the small volume group. There were 91 instances in which the large volume groups had expenses of less than 7 cents per dollar of sales, with 15 cases of expenses per dollar of more than 7 cents.

Table 11. Instances in Which Expenses Per Dollar of Sales Varied from 7 Cents.

Year	Total number	Number with expenses more than 7 cents per dollar of sales	Per cent	Total number	Number with expenses less than 7 cents per dollar of sales	Per cent
1930	6	0	0.0	29	1	3.5
1931	4	2	50.0	31	3	9.7
1932	10	9	90.0	25	9	36.0
1933	26	15	57.6	9	2	22.7
1934	23	8	34.7	12	0	0.0
Total	69	34	49.3	106	91	85.8

Table 12 shows 15 instances in which the small volume group had expenses of more than 10 cents per dollar of sales. There were only five cases in which expenses in the large volume records exceeded 10 cents per dollar of sales. All five of these cases were in 1932, a year of extremely low prices. In fact, 20 per cent of the large volume records for 1932 had expenses of 10 cents per dollar or over. These tables and the comparisons between small and large volume groups illustrate conclusively that there is a relationship between volume and expense per dollar. If these tables are checked for variation year by year, it is shown that the highest expense per dollar of sales came in 1932 and 1933. 1932 was a year of extremely low prices and about an average crop, and 1933 was a year of advancing

prices but an extremely small crop.

Table 12. Instances in Which Expenses Per Dollar of Sales Varied from 10 Cents.

Year	Small Volume Elevators (150,000 bu. or less)			Large Volume Elevators (More than 150,000 bu.)		
	Total number	Number with expenses less than 10 cents per dollar of sales	Per cent	Total number	Number with expenses more than 10 cents per dollar of sales	Per cent
1930	6	0	0.0	29	29	0.0
1931	4	1	25.0	31	31	0.0
1932	10	3	30.0	25	5	20.0
1933	26	9	34.6	9	9	0.0
1934	23	2	8.6	12	12	0.0
Total	69	15	21.7	106	101	4.7

Figure 10, Accumulative Frequency of Expenses Per Dollar of Sales for the Small and Large Volume Records, was added to show more clearly the variation in expense per dollar of sales in relation to volume of grain handled. This chart shows that only 33, or 47.9 per cent, of the small volume group had expenses of less than 7 cents per dollar. This means that 52.1 per cent had expenses of more than 7 cents. In the large volume group 91, or 85.8 per cent, had less than 7 cents expense per dollar of sales, while 60.3 per cent had less than 5 cents expense per dollar of sales.

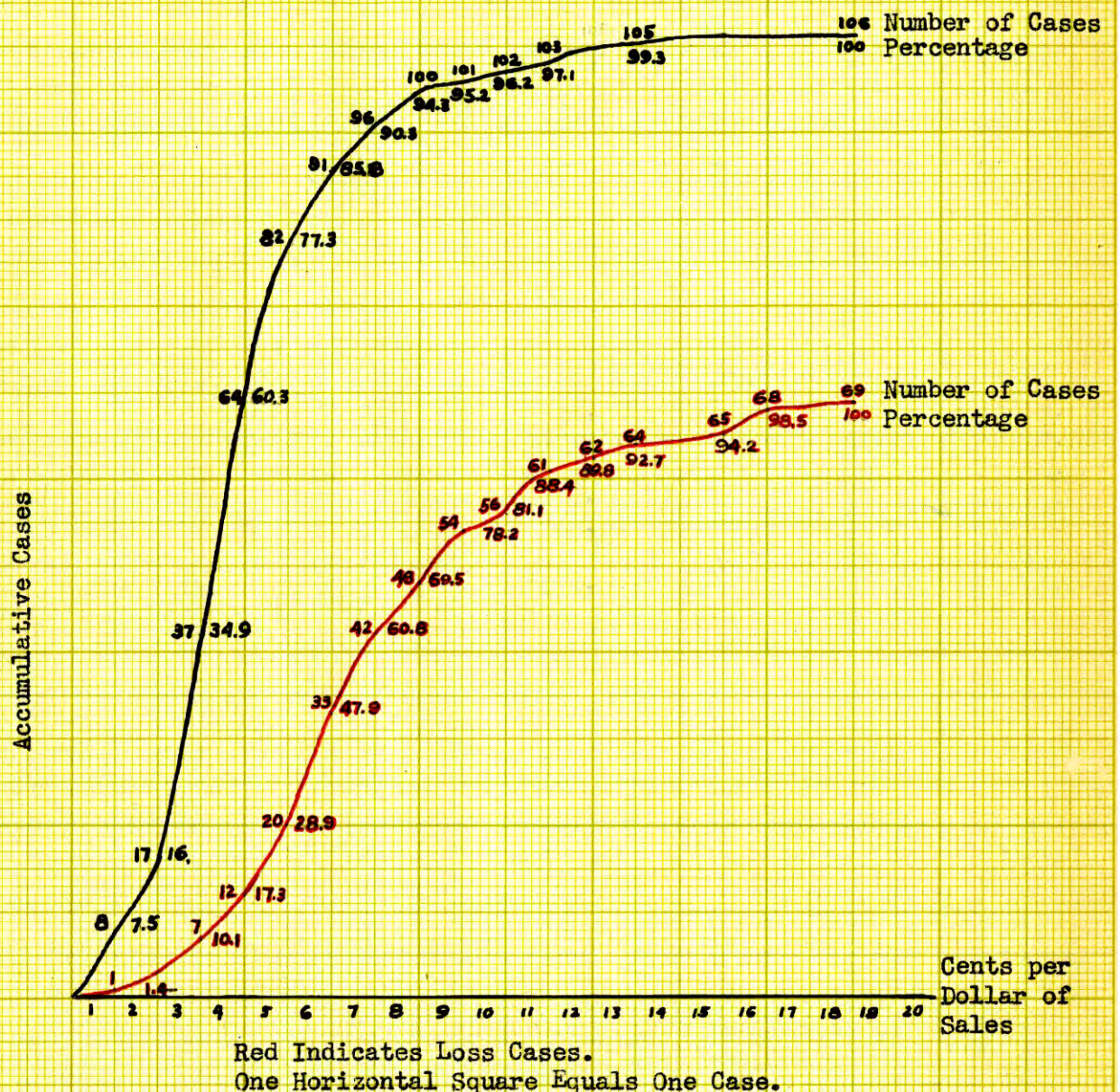

Figure 10. Accumulative Frequency Table of Expenses per Dollar of Sales for the Small and Large Volume Records.

EXPENSES PER DOLLAR OF SALES IN RELATION TO VOLUME AND TO PROFIT OR LOSS

Consideration has been given to expenses and margins per dollar of sales regardless of the profit or loss of the association. The margins or expenses per dollar of sales of the large and small volume associations in relation to the profit or loss were studied next.

These comparisons are made from Table 7, which indicates the array of total expenses per dollar of total sales and the profit or loss. For this study net profit includes other income. This is advisable because: (1) Most of the other income is patronage dividend on wheat from terminal marketing agencies. (2) Practically all associations show some return from storage in 1930 or 1931. (3) Collection of bad debts written off is another source of income. (4) Some associations show income from grinding as other income although it is income from operations when the elevator is equipped. (5) Practically all audits show net income in this manner and do not (at least in the early years) show other income separately.

There were 128, or 73.1 per cent, of the total (175 records) which showed a net return over and above cost of operation, and 46, or 26.3 per cent, which showed a loss,

as shown by Table 13. There were 69, or 39.5 per cent, of the 175 records in the group which handled 150,000 bushels of grain or less per elevator. There were 106, or 60.5 per cent, in the group which handled more than 150,000 bushels of grain. The fluctuation in volume handled during this five-year period was quite severe as indicated in the general statements.

Table 14 shows there were 31, or 44.9 per cent, of the 69 small volume records which showed a profit and 38, or 55.1 per cent, which showed a loss. There were 97 of the 106 large volume records, or 91.5 per cent, which showed a profit for the entire period and 9, or 8.5 per cent, which showed a loss. This proves rather conclusively that profit or loss is definitely associated with volume of grain handled.

Table 14, when checked for yearly variation, shows that the largest percentage of records with a loss within both the small and large volume group came in 1932, a year of extremely low prices. The total number of losses is a little higher in 1933 due to the fact that there were only 10 records in the small volume group in 1932 and there were 26 records in that group in 1933. Seventy per cent of the small volume group in 1932 showed a loss, while 24 per cent of the large volume group showed a loss. In 1933 and 1934,

Table 13. Profit and Loss for All Elevators by Years.

Year	Total number of yearly records	Total number showing a profit	Per cent	Total number showing a loss	Per cent	Records Showing a Profit: Number in large volume group	Per cent	Number in small volume group	Per cent	Records Showing a Loss: Number in large volume group	Per cent	Number in small volume group	Per cent
1930	35	29	82.8	6	17.2	27	93.1	2	6.9	3	50.0	3	50.0
1931	35	32	91.4	3	8.6	30	93.7	2	6.3	1	33.3	2	66.7
1932	35	22	62.8	13	37.2	19	86.3	3	13.7	6	46.1	7	53.9
1933	35	22	60.0	14	40.0	9	42.8	12	57.2	0	0.0	14	100.0
1934	35	24	68.5	11	31.5	12	50.0	12	50.0	0	0.0	11	100.0
Total	175	128	73.1	47	26.9	97	75.7	31	24.3	10	21.2	37	78.8

Table 14. Profit and Loss of Elevators Classified on Basis of Volume Handled.

Year	Small Volume Elevators (150,000 bu. or less)						Large Volume Elevators (More than 150,000 bu.)					
	Total number of elevators	Number showing a profit	Per cent	Number showing a loss	Per cent		Total number of elevators	Number showing a profit	Per cent	Number showing a loss	Per cent	
1930	6	2	33.3	4	66.6		29	27	93.1	2	6.9	
1931	4	2	50.0	2	50.0		31	30	96.7	1	3.3	
1932	10	3	30.0	7	70.0		25	19	76.0	6	24.0	
1933	26	12	46.1	14	53.9		9	9	100.0	0	0.0	
1934	23	12	52.1	11	47.9		12	12	100.0	0	0.0	
Total	69	31	44.9	38	55.1		106	97	91.5	9	8.5	

with increased prices, all of the large volume group showed profits, while 53.9 and 47.9 per cent respectively of the small volume records sustained losses in the same years.

Table 15 shows the records with a profit, arrayed from the smallest to the largest profit per dollar of sale. In this array the small volume records are marked and the large volume records are left unmarked. Figure 11 shows the frequency of the profit based on intervals of one cent per dollar of sales. There were 29 of the 128 profit cases which were in the group of 1 cent and less than 2 cents profit per dollar of sales. There were 25 cases in the group of less than 1 cent and 24 cases in the group 2 cents and less than 3 cents per dollar of sales. Thus, over 50 per cent of the profit cases fell in the group of less than 3 cents profit per dollar of sales. Twenty-eight of the 51 cases of more than 3 cents profit per dollar of sales were less than 5 cents profit per dollar of sales. One record showed more than 10 cents profit per dollar of sales.

Figure 12 shows the frequency of profit per dollar of sales for each of the five years. There were 53 of the 78 cases of less than 3 cents profit per dollar of sales in 1930, 1931, and 1934, with 13 cases in 1932, a year of extremely low prices and nearly average volume, and 12 cases in 1933, a year of extremely low volume and rising prices.

Table 15. The Net Profit per Dollar of Sales Arrayed from Smallest to the Largest Net Profit.

1930	1931	1932	1933	1934
0.1*	0.2	0.1*	0.1	0.2
0.3	0.2	0.1*	0.4	0.2*
0.7	0.9	0.3	0.7*	0.3*
0.9	0.9	0.4	1.3*	0.3*
1.0	1.3	1.4	1.6	0.5
1.1	1.4*	1.6	1.8	0.6*
1.4	1.4	1.6	1.9	0.6*
1.5	1.6*	1.7	2.3*	0.8
1.6	1.8	1.9	2.3*	0.9*
1.7	1.8	1.9	2.3	1.1
1.8	2.2	2.0	2.7*	1.1
2.1	2.3	2.2	2.9*	1.4
2.1	2.5	3.0	3.6	1.8*
2.4	2.6	3.6	3.9	1.9
2.8	2.6	4.3	4.0*	1.9
2.9	2.8	4.8	4.2*	2.1
3.5	2.9	5.1	4.9*	2.2*
3.6	3.2	5.6	5.1	2.4*
4.1	3.5	5.9	5.9*	2.4
4.2	3.6	6.4	7.6	2.5
4.2	3.6	9.4		3.2*
5.1	3.8			3.8*
5.1	3.9			4.2*
5.3	4.1			4.9
5.6	4.7			
6.2	4.9			
6.6	4.9			
6.7	5.5			
10.3*	6.6			
	7.4			
	7.4			
	9.3			

* Numbers starred indicate small volume records. All others indicate records with more than 150,000 bushels of grain handled.

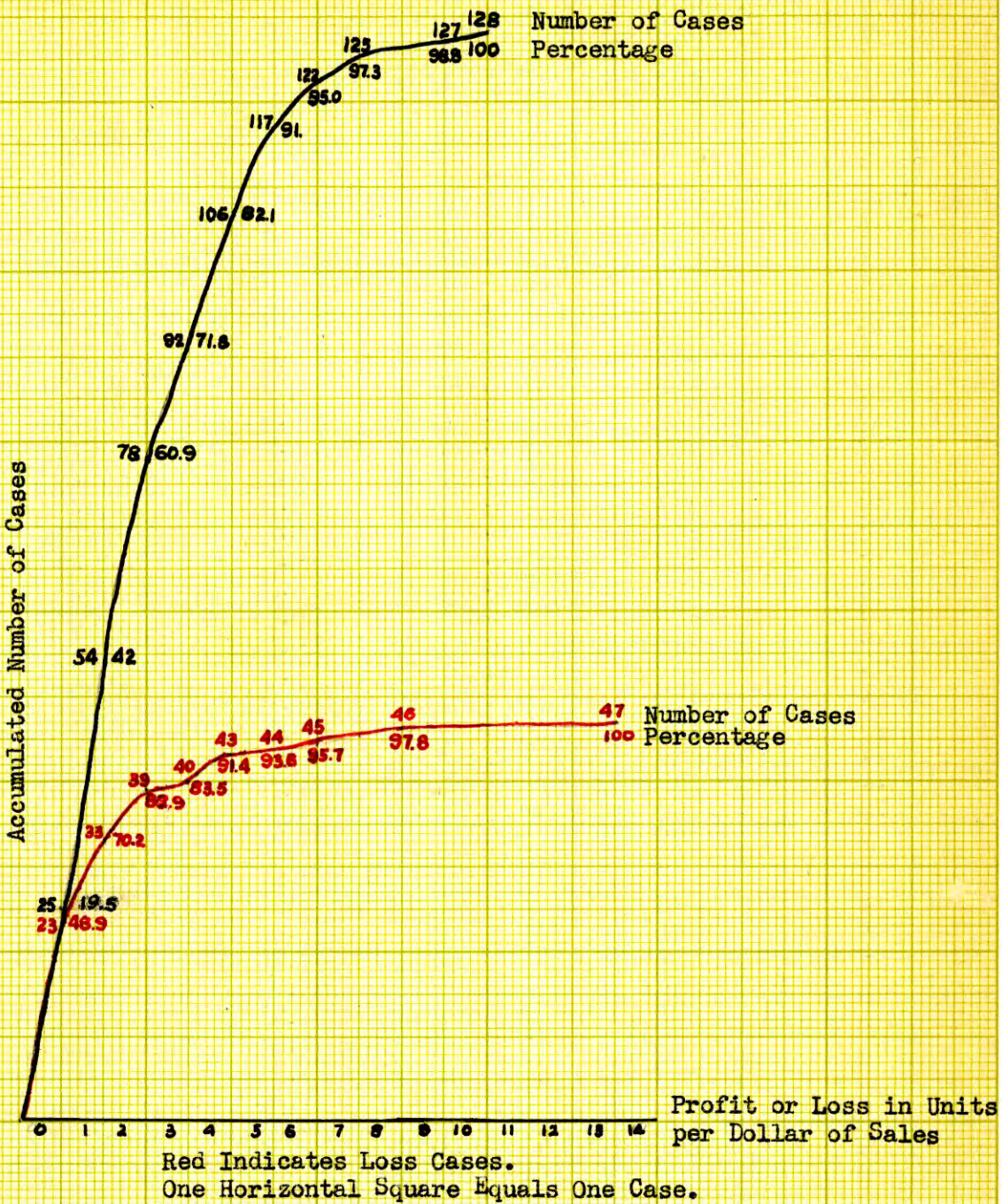

Figure 11. Accumulative Frequency Chart Showing Profit and Loss per Dollar of Sales.

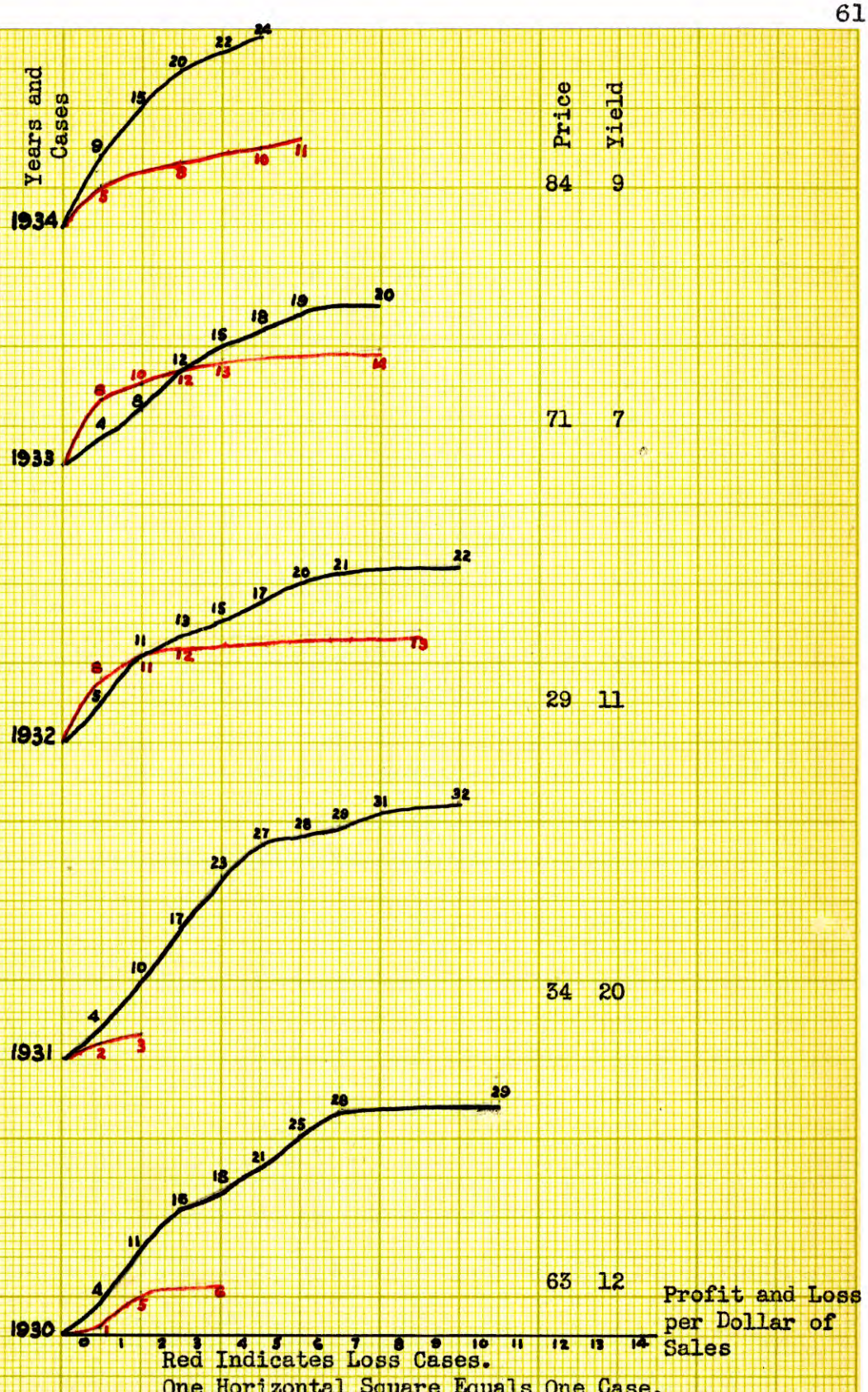

Figure 12. Accumulative Frequency Chart by Years Showing Profit and Loss per Dollar of Sales.

The total profit cases by years indicate that the smallest number of elevators with profits were in 1932 and 1933. The year with the largest number of profits was 1931, which was the year with largest volume.

These observations, along with those previously made, indicate that: (1) 91.5 per cent of the large volume records showed a profit above operating expense for the five-year period; and (2) 10 per cent of the small volume records and 24 per cent of large volume records showed a loss in 1932, a year with nearly an average crop but extremely low prices. This leads to the conclusion that profits are made most easily during years of average or better than average yield, or years of average or better than average prices, or both. This should be used in a territory where volume does fluctuate as a criterion that profit made in these average or better than average years should not all be prorated in patronage dividends but part at least should be held in reserve to tide over the lean years when losses are likely to occur.

The opposite of the profit situation in regard to loss frequency is the case. Table 16 is the array of the cases in which losses in operation were sustained. The large volume cases are marked, and it indicates that most of the losses are for small volume records.

Table 16. Losses Arrayed by Years from Smallest to Largest Loss per Dollar of Sales.

1930	1931	1932	1933	1934
0.5*	0.2	0.2	0.2	0.1
1.0	0.2*	0.2*	0.2	0.1
1.0*	1.0	0.3	0.4	0.1
1.1		0.3*	0.4	0.4
1.1		0.4	0.4	0.5
3.5		0.5	0.7	2.0
		0.7	1.2	2.7
		0.7	1.7	2.7
		1.0*	2.4	4.6
		1.5	2.8	4.7
		1.7*	4.0	6.1
		2.5*	7.6	
		8.3*	13.5	

* Numbers starred indicate a large volume record. All others indicate records with less than 150,000 bushels of grain handled. All records showing loss in 1933 and 1934 were small volume records.

Figure 11 shows the frequency distribution of the loss per dollar of sales for each of the five years. It shows that 23 of the 47, or 48.9 per cent, of the losses were for less than 1 cent per dollar of sales. It also shows 33 of the 47, or 70.2 per cent, of the losses were less than 2 cents per dollar of sales. Figure 12 also shows the largest number of losses occurred in 1932 and 1933.

Comparisons were made of margins taken per dollar of sales in relation to profit and loss. This comparison

showed that those associations which showed a profit took wider margins than did those associations which showed a loss. Figure 13 is an accumulated frequency chart on the margins taken per dollar of sale for associations showing a profit and for those showing a loss. This indicates that the wide margins are in the profit group. Thirty of the 47 losses, or 63.8 per cent, were associated with margins of less than 7 cents per dollar of sale. There were only 50 of 128 records showing a profit in which margins were less than 7 cents per dollar of sale. This was only 39 per cent, or in other words, 61 per cent of the profit cases were associated with margins of more than 7 cents per dollar of sales.

COMPARISONS OF SALARY AND LABOR EXPENSE TO DOLLARS OF SALES AS AN INDICATOR OF ADJUSTMENTS MADE IN EXPENSES TO MEET FLUCTUATING PRICES AND VOLUME

A study was made of the expenses per dollar of sales due to salary and labor costs as a means of determining some of the adjustments made to meet fluctuating prices and volume of business. Salary and labor constitute, according to recognized business standards, 50 to 60 per cent of the total expense item. It is, therefore, the predominate expense item and one which, to boards of directors and stockholders, appears large. It is also the one item most

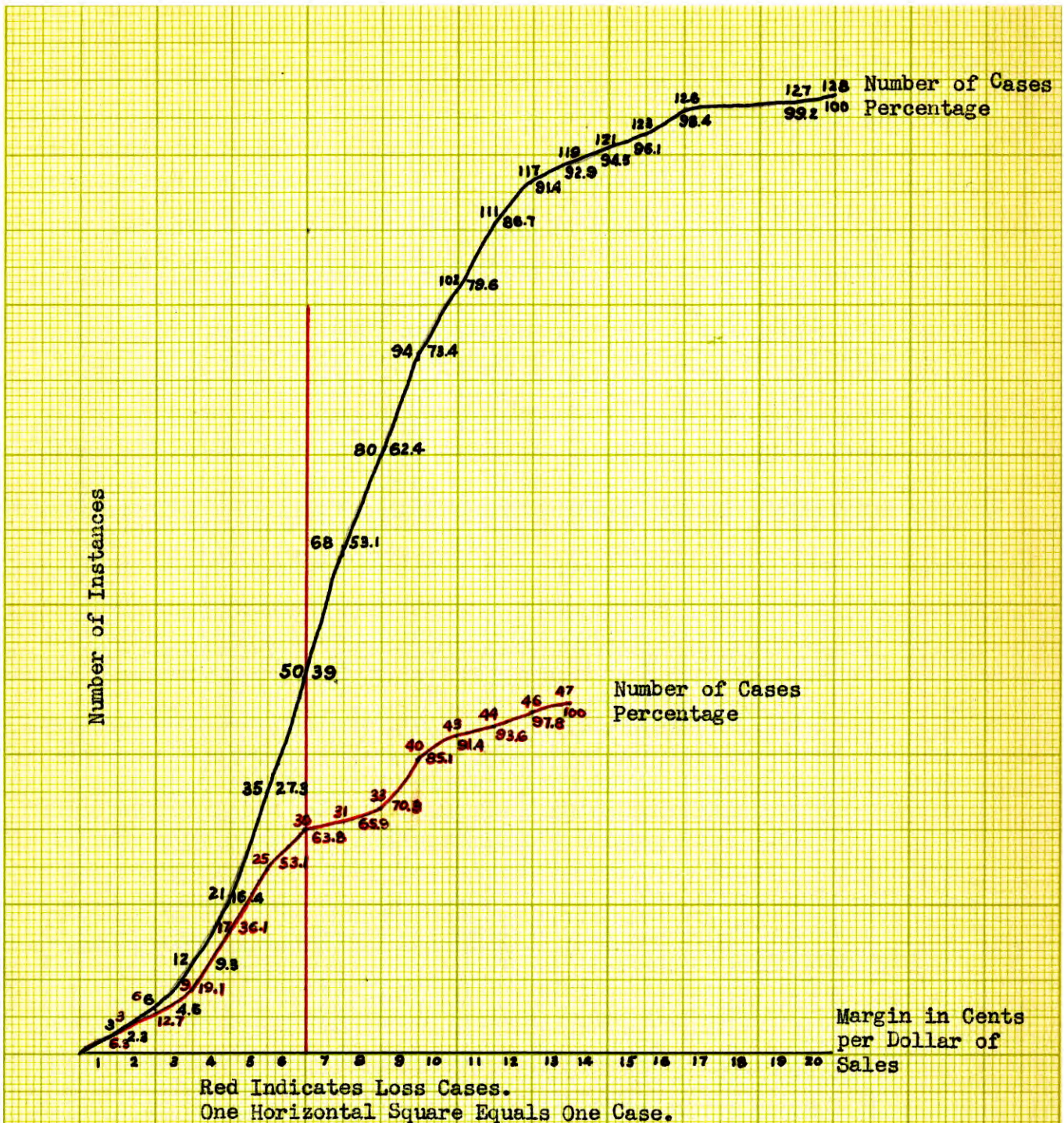

Figure 13. Accumulative Frequency Chart for Profit Cases Based on Margins Taken per Dollar of Sales.

easily acted upon by boards of directors. For the records under study, the salary and labor expense average 47.4 per cent of the total expense account with a range from 45.4 to 49.2 per cent which indicates that salary and labor were probably not reduced much out of proportion to the rest of the expense items. Salary and labor adjustments should, therefore, give a fairly accurate picture of total expense adjustments. It is recognized that in this adjustment of salary and labor expense there has been some shifting and replacement of management and labor.

In these comparisons, as in previous comparisons, an array was made of the salary and labor expense per dollar of sales. This array by years is shown in Table 17. From this table an accumulative frequency chart, Figure 14, was made for the entire 175 records. This shows very clearly that the numbers of cases falling in the 2 and 3 cent cost per dollar of sales is large--48.5 per cent of all cases having a salary and labor cost of less than 3 cents, 18.2 per cent a cost of less than 2 cents, while 70.8 per cent had a salary and labor cost of less than 4 cents per dollar of sales.

Table 17. Salary and Labor Expense per Dollar of Sale Arrayed for Thirty-five Cooperative Elevators for Each of Five Years, 1930-34.

1930	1931	1932	1933	1934
1.0	1.0	1.6	1.3	0.8
1.1	1.3	2.6	2.4	1.0
1.1	1.6	2.6	2.4	1.3
1.1	1.7	2.8	2.4	1.4
1.2	1.8	2.9	2.5	1.4
1.6	2.0	2.9	2.7	1.4
1.6	2.1	3.1	2.7	1.5
1.6	2.1	3.1	2.7	1.6
1.7	2.2	3.2	2.8	1.8
1.8	2.5	3.2	3.2	1.8
1.9	2.5	3.2	3.3	1.8
1.9	2.6	3.2	3.5	1.8
2.0	2.6	3.5	3.6	1.9
2.0	2.7	3.5	3.6	2.0
2.0	2.7	3.6	3.6	2.0
2.0	2.7	3.9	3.7	2.2
2.2	2.7	3.9	4.0	2.3
2.2	2.8	4.0	4.2	2.4
2.3	2.9	4.2	4.2	2.5
2.3	2.9	4.2	4.2	2.6
2.4	3.0	4.2	4.3	2.7
2.4	3.1	4.2	4.3	2.9
2.7	3.2	4.3	4.4	2.9
2.7	3.3	5.0	4.4	3.0
2.7	3.7	5.0	4.4	3.0
2.9	3.7	5.4	4.5	3.5
3.0	4.0	5.6	4.5	3.6
3.0	4.2	5.9	4.6	3.7
3.1	4.4	6.0	5.3	3.9
3.3	4.5	6.6	5.4	3.9
3.5	4.6	6.7	7.8	4.0
3.7	5.1	6.8	7.9	4.1
3.8	5.6	7.2	8.0	5.1
3.8	6.5	7.4	8.1	6.7
5.0	7.3	8.3	9.9	

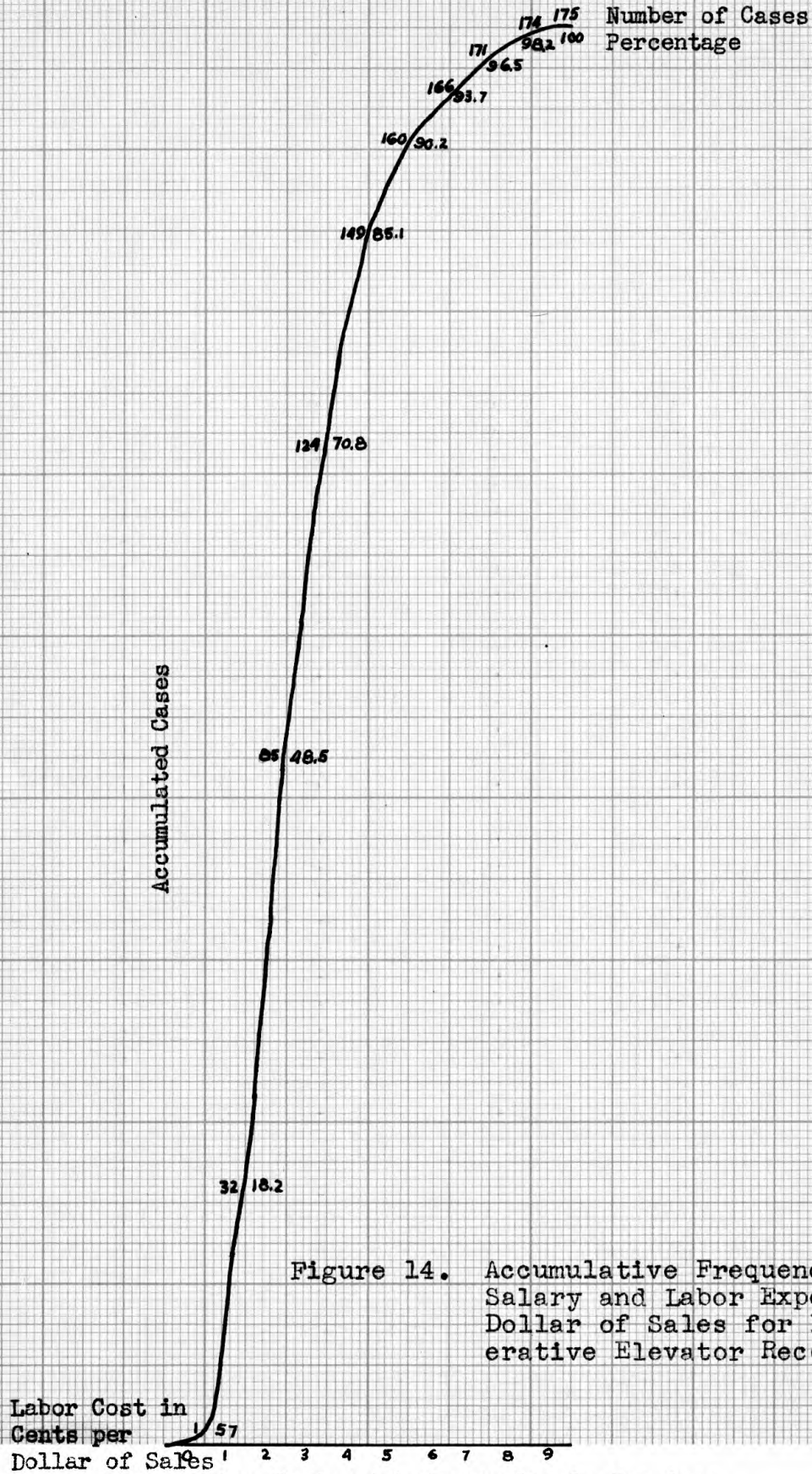

Figure 14. Accumulative Frequency Chart of Salary and Labor Expense per Dollar of Sales for 175 Cooperative Elevator Records.

Comparisons of average total expense, average labor expense, average dollar sales, and average bushels handled were made in Table 18 to indicate some adjustments made to fluctuating price and volume. In these comparisons it is shown that total sales dropped 66.7 per cent from 1930 to 1933, but in 1934 increased 52 per cent over 1933 and were 50 per cent of 1930 sales. Bushels handled followed somewhat the same trend except that bushels handled increased 30 per cent in 1931 over 1930, then fell in 1933 to 34.8 per cent of the 1930 volume, which was a decrease of 73.4 per cent from 1931 to 1933. The bushels handled in 1934 increased 32 per cent over 1933 but were still only 46 per cent of the bushels handled in 1930.

The comparison of expense adjustments indicates in this same table that both average total expense and salary and labor expense decreased steadily throughout the entire five-year period. The average total expense was reduced 39.8 per cent from 1930 to 1934. The average salary and labor expense was reduced 42.4 per cent. A comparison of these two items by years indicates that first salary and labor were reduced severely and that total expense was reduced later. Table 18 shows that salary and labor were reduced 11.8 per cent in 1931 compared to 10.8 per cent for total expense in spite of an increase in bushels of 30 per cent

and a decrease of 30.8 per cent in dollars of sales. In 1932, salary and labor were reduced 15.3 per cent in relation to 1931 compared to an 8.9 per cent reduction in total expenses in relation to a 37.6 per cent decrease in bushels handled and a 41 per cent decrease in sales. In 1933, salary and labor were again reduced 20.6 per cent as compared to 1932, while total expense was reduced 21.3 per cent in relation to a 57.3 per cent reduction in bushels handled but only an 18.8 per cent reduction in dollars of sales. In 1934, salary and labor were again reduced 3.2 per cent as compared to 1933, while total expense was reduced 6.4 per cent. At the same time there was a 32 per cent increase in bushels handled and a 52 per cent increase in dollars of sales. This would indicate that adjustments in expense and especially salary and labor are made more in relation to price fluctuations than in relation to number of bushels handled. It also indicates that the low salary and labor cost per dollar of sales in 1934, as shown in Figure 15, is partly due to reduced salary and labor expense as well as to increased prices for the commodity handled. This is further substantiated by a comparison of two specific years with nearly the same yield per acre. In 1930, the average yield was 12 bushels per acre, and in 1932 it was 11 bushels. The year 1932 showed a decrease of 18.6 per cent in bushels

Table 18. Comparative Average Total Expense, Average Labor Costs, Average Dollar Sales, and Average Bushels Handled for Thirty-five Identical Associations for Five Years.

year	Average total expense	Per cent reduction in total expenses from 1930	Per cent reduction in total expense from previous year	Average total salary and wages	Per cent reduction in wages from 1930	Per cent reduction in wages from previous year	Average total sales	Average sales in per cent of 1930 sales	Per cent change in total sales from previous year	Average bushels handled	Per cent change from 1930 in average bushels handled	Per cent change from previous year
1930	$14,371	------	------	$7,154.01	------	------	$321,962.07	----	-----	320,012	-----	-----
1931	12,831	-10.8	-10.8	6,313.43	-11.8	-11.8	223,093.95	69.2	-30.8	417,458	+30.0	+30.0
1932	11,723	-18.5	- 8.9	5,352.53	-25.2	-15.3	130,892.61	40.6	-41.4	260,686	-81.4	-37.6
1933	9,241	-35.7	-21.3	4,253.89	-40.6	-20.6	107,011.10	33.3	-18.8	111,414	-34.8	-57.3
1934	8,656	-39.8	- 6.4	4,121.37	-42.4	- 3.2	163,281.51	50.7	+52.0	147,579	-46.1	+32.0

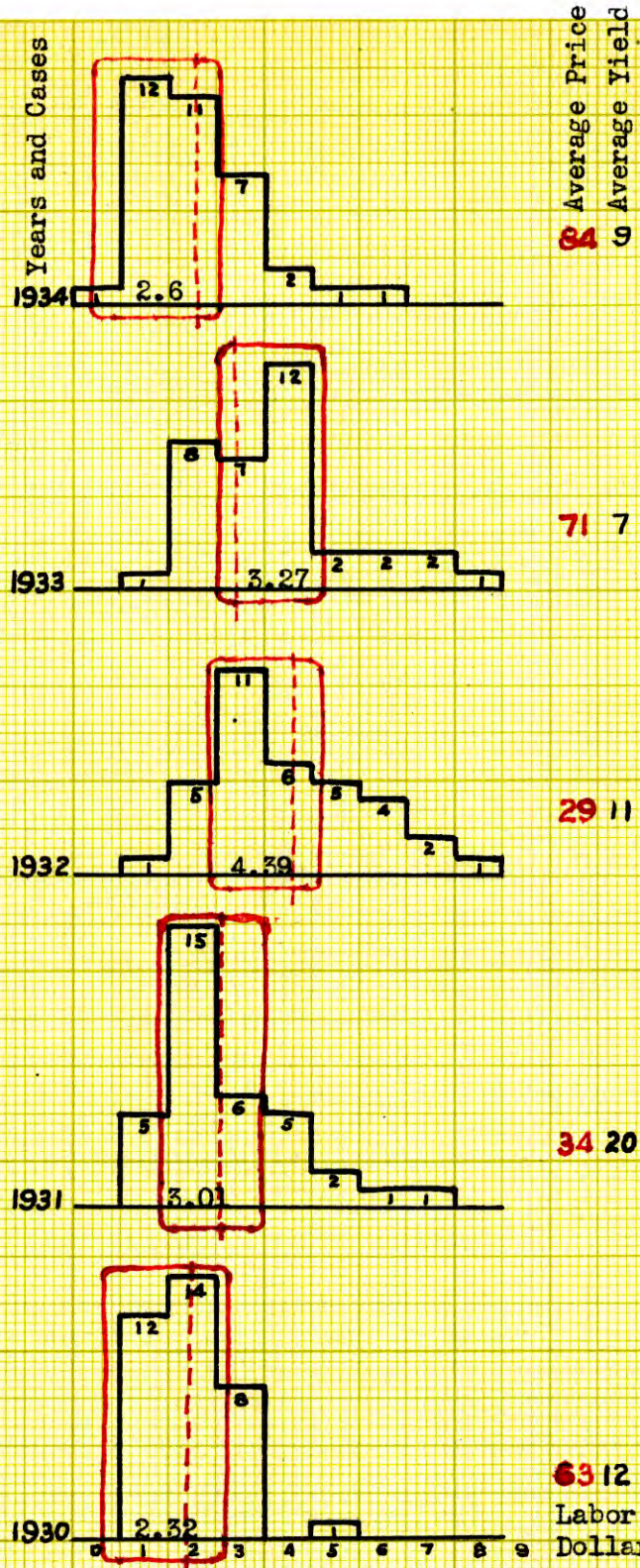

Figure 15. Frequency Distribution of Salary and Labor Expense per Dollar of Sales for 35 Cooperative Elevator Records per Year for the Five-Year Period 1930-34.

actually handled as compared to 1930, with an 18.5 per cent reduction in total expenses, while labor took a 25 per cent reduction. This was accompanied with a 53.9 per cent drop in the price per bushel, and resulted in a 43 per cent drop in net profit.

Salary and Labor Expense in Relation to Small and Large Volume

Comparisons of the salary and labor expense per dollar of sales were made between the small and large volume records by years. These comparisons in Table 19 show the number of instances and also the percentage of cases in the small volume group with a salary and labor cost of more than 2 cents per dollar and the number and percentage of large volume houses with salary and labor expense of less than 2 cents per dollar.

Table 20 shows the same thing on a salary and labor cost of 3 cents per dollar of sales. These comparisons show that 61 of the 69, or 88.4 per cent, small volume cases had salary and labor costs of more than 2 cents per dollar. 1934 was the only year in which any small volume records had a salary and labor cost of less than 2 cents per dollar of sales. The large volume records show that 29.2 per cent, or nearly one-third, had salary and labor costs of less than 2 cents per dollar of sales. In two years, more than 50 per

cent of these large volume cases had a salary and labor cost of 2 cents or less.

Table 19. Associations Having Salary and Labor Expenses of Less Than 2 Cents and More Than 2 Cents per Dollar of Sales.

Year	Small Volume Elevators (150,000 bu. or less)			Large Volume Elevators (More than 150,000 bu.)		
	Total number	Number with salary and labor expense more than 2 cents per dollar of sales	Per cent	Total number	Number with salary and labor expense 2 cents or less per dollar of sales	Per cent
1930	6	6	100.0	29	16	55.2
1931	4	4	100.0	31	6	19.3
1932	10	10	100.0	25	1	4.0
1933	26	26	100.0	9	1	11.1
1934	23	15	65.2	12	7	58.3
Total	69	61	88.4	106	31	29.2

Table 20. Associations Having Salary and Labor Expenses Less Than 3 Cents and More Than 3 Cents per Dollar of Sales.

Year	Small Volume Elevators (150,000 bu. or less)			Large Volume Elevators (More than 150,000 bu.)		
	Total number	Number with salary and labor expense more than 3 cents per dollar of sales	Per cent	Total number	Number with salary and labor expense 3 cents or less per dollar of sales	Per cent
1930	6	2	33.3	29	24	82.8
1931	4	4	100.0	31	21	67.7
1932	10	10	100.0	25	6	24.0
1933	26	22	84.6	9	5	55.5
1934	23	9	39.1	12	12	100.0
Total	69	47	68.1	106	68	64.2

The comparisons of the salary and labor expense per dollar of sales showed 68.1 per cent of the small volume records with an expense more than 3 cents per dollar of sales, and in two years all small volume records had salary and labor expense of more than 3 cents per dollar of sales.

The comparisons for the large volume records show that 64.2 per cent had a salary and labor expense of less than 3 cents per dollar of sales. In 1934, all large volume records had salary and labor expense at less than 3 cents per dollar of sales. In 1931, all small volume records showed salary and labor expense of more than 4 cents per dollar of sales.

These tables indicate that larger volume is associated with lower salary and labor costs and better utilization of labor.

In an endeavor to show how adjustments were made, the salary and labor expense per dollar of sales comparison was divided into management costs and other labor expense as shown in Table 21.

This indicates that a large reduction was made first on the manager's salary in 1931. This was a year with a large increase in the bushels handled, but was a period of declining prices. The manager's salary was the largest single expense item, and was the first one to be reduced. Other labor received some reduction, but with the large increase

Table 21. Salary for Management and Other Labor Expense.

Year	Manager's Salary			Other Labor Expense		
	Average	Per cent change from 1930	Per cent change from previous year	Average	Per cent change from 1930	Per cent change from previous year
1930	$2,651.30	-----	------	$4,483.92	-----	-----
1931	2,249.92	-15.2	-15.2	4,066.33	- 8.9	- 8.9
1932	1,932.30	-27.2	-14.12	3,422.82	-23.7	-15.9
1933	1,633.40	-38.4	-27.50	2,623.06	-41.6	-35.5
1934	1,652.51	-37.6	+ 1.02	2,468.86	-44.9	- 5.9

in bushels handled this was limited. With continued low prices in 1932 but nearly an average crop, the manager's salary again took a heavy reduction, but not quite as much as the reduction in other labor. In 1933, a year of rising prices but extremely small volume, other labor received the larger reduction. Manager's salary took another 27.5 per cent reduction from 1932, but other labor had a reduction of 35.5 per cent from 1932. The manager's salary was raised .2 of 1 per cent in 1934 as compared to 1933, while other labor took a reduction of 6.2 per cent in relation to 1933. By 1934, other labor had been reduced 44.9 per cent in relation to 1930, and the manager's salary had been decreased 37.6 per cent.

When salary and other labor expense comparisons are made in relation to small volume and large volume, it is plain that management costs form a higher per cent of the salary and labor costs in small volume records than do management costs of large volume records. The small volume associations show a range of 44 to 65 per cent of the total labor expense, due to management, whereas the management percentage for the large volume cases range from 26 to 36 per cent of the total labor expense. Management undoubtedly is more efficiently used in the larger volume associations.

Comparisons were made from the array of salary and labor expenses per dollar of sales on the yearly basis to indicate the changes in expense per dollar of sales by making frequency distribution on the basis of cut per dollar of sales. This is shown in Figure 15. This chart shows graphically that salary and labor expense does vary with fluctuations in price very similar to the variations in total expenses per dollar of sales.

The average salary and labor expense per dollar of sales by years was as follows: In 1930, 2.32 cents; 1931, 3.01 cents; 1932, 4.39 cents; 1933, 3.27 cents; and 1934, 2.6 cents. With a range of 2 cents per dollar of sales, the average always fell within this range. That is, in 1930 26 cases had salary and labor expense 1 cent and less than 3; in 1931, 21 cases were 2 cents and less than 4; in 1932, 17 cases were 3 cents and less than 5; in 1933, 19 cases were 3 cents and less than 5; and in 1934, 23 cases were 1 cent and less than 3. This grouping of cases is more conclusive than averages that the salary and labor expense per dollar of sales varies the same as total expenses with fluctuating prices and volume. This is indicated by referring to Figure 4, which shows the price and yield per acre for each year in comparison to total expense per dollar of sales.

SIDELINE SALES OF COOPERATIVE ELEVATOR ASSOCIATIONS

The associations in this study were primarily set up to handle grain for the producer. Sidelines or services were added partly as service to the members and partly as a supplement to permit more efficient use of capital and labor. During the period 1930-1934, with low prices and a small volume of grain, additional sidelines and services were added. This has been particularly true of the adoption of petroleum products as a sideline since farms in this section are large and most of them use tractors and trucks. This type of combination grain-handling and supplies as sidelines is desirable from an operating standpoint as there is very little opportunity for a cooperative elevator association and a cooperative oil company in the same small country town. Independent associations result in duplication and added cost since the membership in separate associations would tend to be identical.

Mather (11) stated that apparently there is a point beyond which an increase in sidelines added does not compensate for added expenses. The addition of sidelines usually means smaller sales per transaction, which results in higher labor and bookkeeping costs. This must be accompanied by increased margins. The low purchasing power in

1933 and 1934 emphasized this fact in regard to such feeds as corn, oats, and barley. Previous to 1932, purchases or sales of these commodities were made in 25 to 50 bushel lots. These feeds usually carry a margin of 6 cents per dollar, or approximately 3 cents per bushel. This meant a handling charge to the association of $1.50 for the transaction of 50 bushels. Since 1933, a large percentage of these sales have dropped to 1 to 5 bushels per sale. With the same margin, this has resulted in a handling charge of 3 to 15 cents per transaction. The expense per transaction in time, bookkeeping, and ticket making is just as great as for the 50 bushel transaction. The result is that either margins have to be wider or the association loses money.

The percentage of sideline sales in these cooperative elevators during the period studied increased materially due to: (1) The extreme drop both in volume and in price of the grain handled, and (2) The addition of new sidelines and services in an attempt to maintain the volume of business. The total dollars of sideline sales fell during 1932 and 1933, but did not decrease as much as the dollars of sales of wheat.

This increase in sidelines is likely to continue large even with an increase in the volume of grain due to the

investment in equipment and facilities. This is indicated by Table 22, which shows the increase in the numbers of associations handling petroleum products during this period. The petroleum sideline was used because in most cases it is the largest sideline and required special equipment that, once established, is likely to be permanent.

Table 22. Increase in Total Number and Percentage of Elevators Handling Petroleum Products.

Year	Elevators handling petroleum products	Communities in which petroleum products are handled by separate cooperative	Per cent of elevators handling petroleum products	Communities in which petroleum products are handled cooperatively
1930	8		22.8	22.8
1931	22	1	62.8	65.7
1932	24	2	68.5	74.2
1933	25	3	71.4	80.0
1934	26	3	74.2	82.8

This indicates that there were only nine of the cooperative elevators in 1934 which were not handling petroleum products as a sideline. In three of these nine communities there are cooperative gas and oil associations which practically prohibits the elevator association from such operations. This leaves only six communities not supplied with these products cooperatively.

The addition of sidelines has usually been profitable, as shown by Table 23. Comparison of small and large volume of grain records, combined with small and large sideline records, in relation to the elevators' ability to show profit is shown in this table.

Table 23. Effect of Size of Grain and Sideline Business on Profit.

Kind of Association	Per Cent	Per Cent Which Showed a Profit
Small volume of grain and small sideline	18.2	40.6
Small volume of grain and large sideline	21.1	48.6
Large volume of grain and small sideline	36.0	85.7
Large volume of grain and large sideline	24.7	97.6

This table very clearly indicates the advantage lies with the large volume grain and large sideline combination. This would further substantiate the fact that these associations with facility investment and trade built up will continue in the sideline business with return of grain volume.

CONCLUSIONS

Conclusions derived from this study concerning the variation in expense and margins compared to dollar sales during periods of fluctuating prices are:

1. With normal prices, volume is probably the most important factor in determining the successful operation of an organization.

2. Expenses, either total or labor, per dollar of sales will increase as the price of the commodity decreases, and will be largest at the lowest price. The expense per dollar of sales declines as the unit price of the commodity increases.

3. In the elevator business, as in most businesses, it is extremely difficult to cut expenses as fast as prices fall, and it is equally as difficult to adjust salaries, wages, and other expenses upward at the same rate that prices rise. Costs and margins based on dollar sales offer a ready measure of expenses to associations doing a combined grain and sideline business when the cost of allocating expense to various departments is not possible.

4. Below average yield and price occur frequently in the area studied as shown by the fact that below average yields were harvested 21 times and below average prices were

received 25 times in the past 35 years. This indicates some years with little variation from average and a few with wide extremes of both yield and price.

5. It is easier for an association to show a net profit in a year with average yield and average price than to show a net profit when either price or volume are low.

6. Reserves should be set up during periods of average or above average yields or prices, or both, to carry the association during the periods of low yield or low price.

7. Adjustments of expense made to either volume or price fluctuations are made by labor first. Total adjustments of expense tend to come later.

8. It is hazardous to equip with total facilities for years of maximum production and then have to adjust to handle small crops or failures.

9. Elevators handling a small volume of grain do not increase their volume of sidelines to meet overhead expenses during periods of low prices and small crops as do large volume associations.

10. Associations handling a large volume of grain, once equipment is obtained to handle sidelines, tend to retain or maintain at peak amounts their sideline sales and make them permanent departments of the business.

11. Expenses per dollar of sales tend to increase as sideline sales increase, especially in periods of low purchasing power.

12. Associations showing a profit regardless of volume take a wider margin on the average than do the associations operating at a loss.

13. Net profit from operation is more dependent on price per bushel than in volume handled during periods of declining prices.

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REFERENCES

(1) Ballinger, Roy A.
Financial operations of a group of Oklahoma farmers' elevators, 1930-1932. Oklahoma A. and M. Expt. Sta. Bul. 221. 15 p. 1934.

(2) Bell, E. J. Jr.
Current problems of Montana farmers' elevators. Montana Agr. Expt. Sta. Bul. 226. 48 p. 1930.

(3) Benton, Alva H. and Peightal, N. P.
Farmers' elevators in North Dakota. North Dakota Agr. Expt. Sta. Bul. 206. 52 p. 1927.

(4) Donaldson, D. N. and Hemphill, Perry V.
Operating practices of farmers' cooperative elevators in Colorado. Colorado Expt. Sta. Bul. 397. 59 p. 1932.

(5) Francis, Gerald M.
Financial management of farmers' elevators. A. W. Shaw Company, New York, New York. 109 p. 1926.

(6) Green, R. M.
Membership, financial, and operating status of cooperative country elevators in Kansas, 1931-1934. Farm Credit Administration Cooperative Division Misc. Report 1. 32 p. 1936.

(7) Green, R. M. and Ballinger, Roy A.
Membership, financial, and operating status of cooperative country elevators in Oklahoma, 1931-1934. Farm Credit Administration Cooperative Division Misc. Report 6. 25 p. 1936.

(8) Green, R. M. and Ballow, E. B.
Country elevator margins and costs in marketing Kansas wheat. Kansas Agr. Expt. Sta. Bul. 246. 60 p. 1927.

(9) Green, R. M. and Rucker, Vance M.
Marketing problems of farmers' elevators in Kansas. Kansas State College Ext. Cir. 106. 20 p. 1934.

(10) Grinnell, H. C.
An economic study of the organization, finance, and operations of farmers' business cooperatives in Vermont. Vermont Agr. Expt. Sta. in cooperation with Federal Farm Board Bul. 346. 103 p. 1932.

(11) Mather, J. Warren.
An analysis of sidelines and their effect on net operating profits of Kansas cooperative elevators. Unpublished thesis, Kansas State College. 129 p. 1936.

(12) Metzger, Hutzel and Price, H. Bruce.
Economic aspects of local elevator organizations. Minnesota Agr. Expt. Sta. Bul. 251. 55 p. 1929.

(13) Post, R. E.
Farmers' elevators in the spring wheat area of South Dakota. South Dakota Agr. Expt. Sta. Bul. 282. 282 p. 1933.

(14) Price, H. Bruce and Arthur, Charles M.
Management problems of farmers' elevators. Minnesota Agr. Expt. Sta. Bul. 224. 94 p. 1925.