

**The Estimation of a Grain Handling
Margin for Elevators in Barley
Producing States**

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I. INTRODUCTION

The estimation of an accurate margin charged by grain elevators for handling grain has many important applications for agricultural and transportation analyses. Among these applications are margins' effect on producer prices, their relationship to transportation rates, and their use in differential pricing.

The margin is also of interest because it is the one ingredient in grain pricing that is controlled directly by grain elevators. Prices received for grain by farmers and the amount of grain handled by elevators are affected by the level of the margin.

The research problem with using margins for transportation and agricultural analysis is that information on margins is difficult to obtain. Elevator managers are reluctant to divulge information about margins charged. Research estimating margins has not been done recently.

Because of the importance of margins, and because of the difficulty in obtaining margin data, a method for converting past cost estimates into current margins would be extremely useful. As a part of The Northern Plains Barley Study, this report develops a method for converting past cost estimates into current margins. This is done in order to obtain local cash prices paid to producers from market prices for all major areas of barley production. The objective of the Northern Plains Barley Study is to examine major barley producing regions across the United States and attempt to explain market share differentials and interregional trade flow differentials.

In the next section, the theory of the relationship between market prices and local cash prices is examined. Then, a review of past literature is performed. After the literature review, the method of estimating margins and actual margin estimations are shown. Finally, conclusions are drawn.

II. THEORY

Market price can be linked to elevator bid prices (local prices paid to producers) through grain handling margins and transportation rates. This link can be explained by equation 1.

$$\text{LCP} = \text{MP} - (\text{TR} + \text{M}) \quad (1)$$

where: LCP = Local Cash Price Paid to Producers
 MP = Market Price
 TR = Transportation Rate
 M = Elevator Margin

This equation shows that local cash prices paid to producers can be obtained with information about the other three variables. Market price data are readily available in the Grain and Feed Market News, a USDA publication. Transportation rates can be obtained from Rail Waybill Data. With the estimation of an accurate grain handling margin, elevator bid prices can be calculated.

One potential source of uncertainty within this equation is the absence of data on truck and barge rates. It is assumed that rail rates should reflect the existence of truck and barge competition. Therefore, rail rates should be comparable to the rates charged on truck and barge transportation where these alternatives exist. Thus, the absence of truck and rail rates is not a serious concern in this analysis.

III. REVIEW OF LITERATURE

In reviewing the literature, no recent studies were discovered that estimated elevator margins. However, several studies have estimated elevator costs.

The costing studies can be used to estimate grain handling margins. Grain handling margins are the main source of revenue for grain elevators. Neo-Classical

economic theory assumes that in the absence of barriers to entry, zero economic profits are realized in the long run. This means that total revenues should equal total costs (including opportunity cost) in the long run. The grain handling margin, then, can be estimated as being equal to total costs (including opportunity cost) in the long run.

A. Elevator Costs

After reviewing elevator costing studies, elevator behavior with regard to margins is considered. Several recent studies have attempted to estimate grain elevator costs. These studies have used a variety of data sources and methods. All found economies of scale to be present.

Chase, Helgeson, and Shaffer used accounting records from 42 percent of the grain elevators in North Dakota to analyze the structure of the North Dakota elevator industry. Using statistical costing analysis, they found economies of utilization to be present in the grain elevator industry. Their study also separated variable costs into those attributable to grain activity and those attributable to non-grain activity. Finally, the authors found that additional economies could be realized through increased utilization.

In a related study, Chase and Helgeson analyzed the costs of potential subterminal elevators in North Dakota. The study used an economic-engineering approach to estimate subterminal elevator costs. Costs were estimated for four different sized elevators. These sizes were 300,000, 500,000, 850,000, and 1,100,000 bushels of storage capacity. Chase and Helgeson found that economies of size exist for potential subterminals. They concluded that additional construction of subterminal elevators may cause financial troubles in the grain elevator industry, because of the underutilization of existing elevators. However, this fact must be weighed against the potential savings from trainload discounts.

Schnake and Stevens used an economic-engineering approach to analyze costs for unit-train loadout elevators in four different regions. Costs were estimated for four different sizes of unit train elevators in the North Dakota region. These sizes were 350,000, 700,000, 1,050,000, and 1,400,000 bushels of storage capacity. The authors found economies of size and economies of utilization to be present in the grain elevator industry. Schnake and Stevens concluded that unit train shipment will dominate the grain industry and that those elevators unable to adapt to the unit train shipment will not survive.

B. Elevator Behavior With Regard to Margins

Two studies were discovered that considered the importance of margins in determining market share and profitability. Elevator managers use pricing strategy (and therefore margins) in order to increase their market share and to maximize profit.

Cobia, Wilson, Gunn, and Coon updated the costs estimated by Schnake and Stevens. They then tried to explain differential pricing by elevators using these costs. They studied marginal cost pricing and differential pricing based on different demands. Marginal cost pricing is based on different costs of providing services to different classes of patronage. Differential pricing is designed to attract more volume in competition with other elevators.

Differential pricing was found to be a necessary ingredient for survival. Differential pricing is necessary to attract large volume producers, and greater volumes of grain handled will lower average costs. Price differentials must include a demand dimension, since cost differences between transactions of different sizes are insignificant.

Finally, the authors showed that the use of satellite stations will steadily decline. The costs of handling grain at the satellite stations is much higher than that at the main stations for three reasons. First, grain is loaded and unloaded an extra time when

delivered to the satellite station. Second, transportation cost is increased for the elevator from hauling grain between the satellite and main station. Finally, the equipment at satellite stations is generally less efficient. As a result, higher prices are offered at the main station, more than compensating for the extra transportation cost incurred by producers. Only where premerger agreements took place is this not the case.

Dooley and Wilson developed a model which determines market boundaries of grain elevators given behavior and economic conditions. They found two main determinants of elevator market share; prices paid to producers and the assembly cost to the producer in moving grain. They found that when farmer assembly costs were low, elevators could increase market share greatly through moderate increases in bid prices. Conversely, they found that when assembly costs were high, a large increase in bid prices was necessary to attract grain.

Their model showed how the relationship between market price and local cash prices is affected by the elevators' desire for increased market share. The model showed three main things about elevator behavior. First, increases in market prices increase prices paid to farmers by the amount of the market price increase. This occurs because elevators do not change margins in this event, as market prices increase by the same amount for all elevators. Second, when a decrease in shipping costs occurs for an elevator, much of the decrease in cost will be passed on to the producer. For an aggressive marketing elevator some of these savings will result in an increased margin. Finally, if one elevator lowers the grain handling margin, other elevators will lower margins in order to compete for grain.

The two articles analyzing margins point out the fact that margins do vary between similar elevators in the short run. Since the purpose here is to determine an

average margin, in order to relate market prices to local cash prices, these short run variations are not a concern in this study. Long run variations in similar sized elevators due to differences in efficiencies are also not a concern, since this report looks at the average margin. The long run variations in margins due to elevator size are accounted for in this report.

IV. MARGIN ESTIMATION

Margins are estimated for five different sized elevators for the years 1984 through 1988. A five step process is used to estimate grain handling margins.

First, 1980 variable and fixed costs are updated to reflect inflation. Next, variable costs are estimated. After variable cost estimation, fixed costs are estimated. Then, average turnover for all five elevator sizes is calculated for the state of North Dakota in 1988. These turnovers are used to estimate margins. Finally, the method for estimating costs for a 100,000 bushel capacity elevator is shown.

Margins are obtained by converting the elevator cost estimates of Chase and Helgeson. Chase and Helgeson is used over Chase, Helgeson, and Shaffer because the latter doesn't report actual cost estimates, and because there are several problems with accounting data (French). Chase and Helgeson estimates are used instead of Schnake and Stevens because the former costs are estimated for smaller sized elevators. Casual observation suggests that more of the small and moderate sized subterminals are being built and used today. Costs are estimated for a 100,000 bushel capacity elevator along with the four sizes estimated by Chase and Helgeson.

A. Adjustment For Inflation

Chase and Helgeson classify costs into fixed and variable, with the fixed

component being classified into depreciable and nondepreciable (Table 1). Variable costs are costs that vary with output in the short run. Fixed costs will only vary in the long run. Depreciable fixed costs are the costs invested in capital. Nondepreciable fixed costs are all other fixed costs.

Some of the classification of cost items are questionable. However, the classifications used by Chase and Helgeson (with two exceptions) are used here for consistency. One exception is that employee benefits, payroll taxes, unemployment compensation, and workmen's compensation are separated between fixed and variable costs. This is done because a portion of these costs are related to the manager and assistant manager. Second, the bookkeeper and the secretary are also combined in this study.

The first step is to convert the 1980 cost estimates into 1984 cost estimates by adjusting the 1980 cost estimates for inflation. All variable costs but four are adjusted by the producer price index for intermediate goods. The remaining four: telephone, advertising, subscriptions, and office supplies are all considered finished goods. These four are adjusted by the producer price index for finished goods. All fixed costs are adjusted by the producer price index for intermediate goods.

Cost estimates were developed for five elevators for five years. As an example, the 1980 cost estimates and their adjustment for inflation to 1984 levels for a 300,000 bushel capacity elevator are presented in the first two columns of Tables 2 and 3. These costs are the costs associated with a grain turnover of ten. Grain turnover simply refers to the volume of grain handled in relation to the capacity of the elevator. Although a grain turnover of ten is quite high, it was used because the costs estimated by Chase and Helgeson were for a turnover of ten. Some costs are changed from the 1983 study due to

TABLE 1: Fixed and Variable Cost Classifications	
Variable Costs	Fixed Costs
Bookkeeper	<u>Depreciable</u>
Secretary	Land
Laborers	Elevator Structure
Employee Benefits	Driveway Structure
Payroll Taxes	Elevator Machinery
Unemployment Compensation	Dust Control
Workmen's Compensation	Drier System
Office Supplies	Electrical
Power	Aeration and Temperature
Telephone	Railroad Trackage
Subscriptions	Railcar Mover
Advertising	Office Building
Special Meeting	Office Furniture
Travel and Convention	Contingencies
Legal Fees	<u>Nondepreciable</u>
Rodent Control	Insurance
Tax and Dividend Work	Bonds
Data Processing	Taxes
Residence Expense	Manager's Salary
Protein Tests	Assistant Manager's Salary
	Director Fees
	Dues
	Annual Meeting
	Warehouse License
Source: Chase and Helgeson (1983)	

TABLE 2: Variable Costs For A 300,000 Bushel Capacity Elevator In 1984

Item Name	1980 Cst.	'84 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/ Secretary	8744	9983	2436	4872	7308
Laborers	29120	33248	8112	16225	24337
Employee Benefits	9845	11241	2743	5485	8228
Payroll Taxes	2840	3243	981	1962	2943
Unemployment					
Compensation	529	604	183	365	548
Office Supplies	2750	3241	734	1468	2202
Elevator Supplies	3500	3996	1998	3996	5994
Power	7500	8563	3425	6850	10276
Telephone	4645	5474	2737	5474	8211
Subscriptions	300	354	80	160	240
Advertising	1750	2062	496	992	1488
Special Meeting	350	400	60	121	181
Travel & Convention	1354	1546	233	467	700
Legal Fees	500	571	139	279	418
Rodent Control	350	400	69	137	206
Tax & Dividend Work	325	371	91	181	272
Data Processing	500	571	137	275	412
Grain Testing/					
Weighing	25208	28781	14391	28781	43172
Workmen's					
Compensation	2600	2969	<u>898</u>	<u>1796</u>	<u>2694</u>
Total Variable Costs			39943	79886	119829
Interest on Variable Cost (6Mo, 10.8%)			2157	4314	6471
Interest on Grain Handled (15 days, 10.8%)			<u>23869</u>	<u>47739</u>	<u>71608</u>
Total Operating Cost			65969	131939	197908
			=====	=====	=====
Operating Cost (\$ per Bu.)			.0439796	.0439796	.0439796

TABLE 3: Fixed Costs For A 300,000 Bushel Capacity Elevator In 1984

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.8%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Insurance	19258	21988	24363	24363	24363
Bonds	3060	3494	3871	3871	3871
Taxes	5091	5813	6440	6440	6440
Manager's Salary	35747	40814	45222	45222	45222
Assistant Manager's Salary	18500	21122	23404	23404	23404
Employee Benefits	16003	18271	20245	20245	20245
Payroll Taxes	4069	4646	5148	5148	5148
Unemployment Compensation	353	403	447	447	447
Workmen's Compenstation	1733	1979	2192	2192	2192
Director Fees	900	1028	1139	1139	1139
Dues	250	285	316	316	316
Annual Meeting	850	970	1075	1075	1075
Warehouse License	39	45	49	49	49
Total Nondepreciable Fixed Costs			133910	133910	133910
Nondepreciable Fixed Costs (\$ per Bu.)			=====	=====	=====
			.0892735	.0446368	.0297578
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Land	10000	11417	1342	1342	1342
Elevator Structure	735000	839186	104243	104243	104243
Driveway Structure	420000	479535	59567	59567	59567
Elevator Machinery	450000	513787	92811	92811	92811
Dust Control	90000	102757	18575	18575	18575
Drier System	120000	137010	24767	24767	24767
Electrical	120000	137010	24767	24767	24767
Aeration and Temperature	40000	45670	8256	8256	8256
Rail Trackage	132590	151385	22286	22286	22286
Railcar Mover	43330	49472	11729	11729	11729
Office Building	60000	68505	8515	8515	8515
Office Furniture	20000	22835	4128	4128	4128
Contingencies	150000	171262	30001	30001	30001
Total Depreciable Fixed Costs Per Yr.			410984	410984	410984
Depreciable Fixed Costs (\$ Per Bu.)			=====	=====	=====
			.2739894	.1369947	.0913298

information from industry sources. Cost estimates for the five elevator sizes in the years 1984 through 1988 are presented in Appendix A.

B. Variable Cost Estimation

After all costs are adjusted for inflation, variable costs will be estimated. This is a four step process.

Step One: Separating Variable Costs Into Those Attributable To Grain and Non-grain Activity

Variable costs are separated into those attributable to grain activity and those attributable to non-grain activity. The margin generates revenue to cover the costs of handling grain. Thus, only those costs that are due directly to grain activity will be used.

Chase, Helgeson, and Shaffer regressed variable costs on the dependent variable grain activity using log transformations. The estimates can therefore be interpreted as the percentage of the particular cost component attributable to grain activity (Table 4).

The estimates in Table 4 are multiplied by variable cost items in order to estimate variable costs due to grain activity. The estimates are not differentiated between states, since these are the only estimates that exist. The variable costs due to grain activity for a turnover of ten are reported in the fourth column of Table 2. An example of how variable costs attributable to grain activity are estimated is shown for the advertising expense of a 300,000 bushel elevator in 1984.

1. Total Advertising Expense = \$2,062
2. Percentage of Advertising Expense Attributable to Grain Activity = 48.1%
3. $\$2,062 * .481 = \992
4. $\$992 =$ Advertising Expense Due to Grain Activity

TABLE 4: Individual Cost Components and Their Respective Two-Year Average Allocation Factors For 1978 and 1979	
Item	Allocation Factor
Salaries¹	.488
Maintenance²	.344
Taxes³	.605
Supplies⁴	.453
Light, Heat, and Power⁵	.588
Marketing^{6&7}	.481
Meetings⁸	.302
<p>¹Salaries, bookkeeping, legal fees, and tax and dividend work. ²Repairs and rodent control. ³Payroll and unemployment compensation taxes. ⁴Office supplies and subscriptions. ⁵Industry sources suggest that a more reasonable allocation factor for power would be .80. ⁶Telephone, data processing, and advertising. ⁷Industry sources suggest that 100% of telephone costs can be attributed to grain activity. ⁸Special meeting, travel, and convention expenses.</p> <p>Source: Chase, Helgeson, and Shaffer (1983).</p>	

Step Two: Estimating Variable Costs For Different Turnovers

In order to estimate variable costs for grain turnovers of five and fifteen, a restrictive assumption must be made. It is necessary to assume that variable costs per bushel don't change with volume. This seems to be a very unrealistic assumption, since economies of density are probably realized with increased volume. This occurs as workers become more proficient, electricity costs decrease because of volume discounts, and more efficient use is made of several other factors. However, since this is based on an engineering study, it would be difficult to measure the extent of these economies.

Given the above assumption, variable costs are simply divided by the amount of bushels handled for a grain turnover of ten in order to get a per bushel cost for each variable cost component. This per bushel cost is then multiplied by the amounts of bushels handled at turnovers of five and fifteen. An example of how this is done is shown below for a 300,000 bushel capacity elevator in 1984:

1. Advertising Expense at a Turnover of Ten = \$992
2. $(992/3,000,000) = .000330666$
.000330666 = Advertising Expense Per Bushel
3. $.000330666 * 1,500,000 = \496
\$496 = Advertising Expense at a Turnover of Five

Variable costs at turnovers of five and fifteen for a 300,000 bushel capacity elevator in 1984 are shown in columns three and five of Table 2.

Step Three: Calculating Interest on Variable Costs

Interest rates charged on operating money and on construction costs were obtained from The St. Paul Bank for Cooperatives (Heitkamp). Interest on variable cost is estimated by charging the short term interest rate on total variable costs for a six month period. This is a way of averaging interest paid on variable costs, since not all variable costs occur at the beginning of the year. This was also done in Chase and Helgeson.

Interest on grain handled is estimated by charging the short term interest rate on the value of grain handled for a fifteen day period. The average purchase price of grain in North Dakota in 1980 was determined to be \$3.88 by Chase and Helgeson. This \$3.88 is adjusted for changes in prices received by producers through an index of prices received for all crops in North Dakota from the 1989 North Dakota Agricultural Statistics Book. The adjusted price is then multiplied by the total volume of grain handled in order to

estimate the total value of grain handled.

Step Four: Calculating Operating Costs

The total operating cost is the sum of total variable costs, interest on variable costs, and interest on grain handled. Operating cost per bushel is the total operating cost divided by the volume of bushels handled. The operating cost per bushel will be the minimum margin charged by elevators. The reason for this goes back to simple economic theory. In the short run all fixed costs are sunk. In other words, the decision whether to continue handling grain in the short run only depends on whether variable costs are being covered. If variable costs are not covered, any additional grain handled will increase costs more than revenue.

C. Fixed Costs

In the long run, total costs must be covered. Margins should therefore equal total costs per bushel plus some measure of opportunity cost in the long run. For this reason, it is also necessary to look at fixed costs. Fixed costs are separated into depreciable and nondepreciable fixed costs. Depreciable fixed costs can be thought of as those costs which are consumed over time. These generally consist of capital equipment. Nondepreciable fixed costs are all other fixed costs.

Step One: Estimating Nondepreciable Fixed Costs

Nondepreciable fixed costs will be estimated first. From the cost adjusted for inflation, the annual equivalent fixed cost is the addition of an interest expense to this fixed cost. The appropriate short term interest rate is charged on these fixed costs for one year. This will give the interest expense of each of these nondepreciable fixed cost items. The interest expense is then added to the actual nondepreciable fixed cost items to obtain

an annual equivalent cost.

Annual equivalent cost is the same for different turnover rates within the same elevator. By definition, fixed costs don't vary with output in the short run.

Step Two: Estimating Depreciable Fixed Costs

Finally, depreciable fixed costs are estimated. The annual equivalent cost of depreciable fixed costs from the total depreciable fixed costs is determined by:

$$AEC = PP \left[\frac{R(1+R)^{yrs}}{(1+R)^{yrs}-1} \right] - SV \left[\frac{R}{(1+R)^{yrs}-1} \right] \quad (2)$$

where: AEC = Annual Equivalent Cost
 PP = Purchase Price
 SV = Salvage Value
 R = Long Term Interest Rate
 yrs = Years of Useful Life

In all cases except land, the salvage value is zero, and some annual repair expense is incurred. Thus Equation 2 is modified to be:

$$AEC = PP \left[\frac{R(1+R)^{yrs}}{(1+R)^{yrs}-1} \right] + RE (1+R) \quad (3)$$

where: RE = Repair Expense

Step Three: Separating Fixed Costs Into Handling, Storage, and Sales Components

The full fixed costs are not used in margin estimation, since some of the elevators' revenue comes from sources other than the grain handling margin. Other sources of revenue include grain storage and seed/fertilizer sales. These other sources of revenue

help to cover fixed costs.

Since this report is part of the Northern Plains Barley Study which will compare regional market shares across the United States, an attempt is made to estimate margins for all major barley producing states. Since detailed cost information is not available for grain elevators in states other than North Dakota, the North Dakota elevator costs are used. Elevator costs should not differ greatly among the states in this study. However, an adjustment is made in the percentage of elevator income that is due to grain handling.

In a survey of 45 cooperatives throughout North Dakota, the average percentages of total revenue from handling, storage, and sales/service were estimated from 1978 through 1986 to be 65.2, 20.1, and 14.6 percent, respectively (Table 5).¹ Percentages are taken as an average of single and multiple plant firms.

TABLE 5: Percentage of Revenue Due to Handling, Storage, and Sales/Services For North Dakota (1978-1986)¹ And Washington (1984)²		
Income Source	North Dakota	Washington
Grain Handling	65.2	60.6
Grain Storage	20.1	25.0
Sales and Service	14.6	14.4

¹Source: Wilson and Clow (1988)
²Source: Dooley (1986)

The percentages of revenue due to grain handling, grain storage, and sales/service

¹Since the percentages reported in Wilson and Clow do not add up to 100, the percentages given are taken as percentages of the total (Table 5). This is reasonable since the missing 18 percent is income reported as dividends in other cooperatives. These dividends are not actually paid out, and claims against these cooperatives are actually much more than the cooperatives are worth.

are similar in the state of Washington in 1984.² These percentages are used for Washington and Idaho. The North Dakota percentages are used for North Dakota, South Dakota, and Minnesota. An average of the two percentages is used for Colorado, Montana, and Wyoming. Total annual equivalent nondepreciable fixed costs and total annual equivalent depreciable fixed costs are multiplied by the percentage of income due to grain handling in order to determine the portion of fixed costs which must be covered by the grain handling margin. The portion of fixed costs that must be covered by the margin are then converted into per bushel costs, and added to operating costs per bushel in order to determine the margin that should be charged in the long run. These factors comprise total annual costs and an opportunity cost of capital. The opportunity cost is taken into account by including the interest rate in cost computations. The opportunity cost is the income foregone because the value of capital is not invested elsewhere.

Step Four: Replacing Depreciable Fixed Costs With Market Values

A potential problem with using the depreciable fixed cost data from Chase and Helgeson is that the depreciable fixed costs mentioned are for new elevator construction. Many elevators in use in North Dakota are several years old. The current value of those plants isn't nearly as large as the original estimates. This phenomenon allows older plants to charge lower margins, since the opportunity cost of capital realized by them is much lower (Lytle and Hill). Some argue, however, that the fixed component of repair expense for older equipment is greater (Wilson). This might suggest that the cost differential between older and newer elevators is not that large. Because of the uncertainty of the magnitude of these two effects, a problem still exists.

² Unpublished data received from Frank Dooley, used in his 1986 paper.

To overcome this problem, information on assessed market values of North Dakota grain elevators was obtained. Assessed market values should give a good indication of what the elevators are worth, and therefore what the opportunity costs of capital are. If an elevator is worth \$100,000, that is the amount that could be used to earn interest elsewhere.

The assessed market values are used to estimate average market values for the five elevator sizes. Average market values are estimated by a regression which explains market value by bushel capacity, and by dummy variables representing small and large elevators. The regression results are shown in Equation 4.

$$EV = 233,570 + 0.43 * CP - 106,407 * U200 + 218,462 * O500 \quad (4)$$

(5.11) (1.58) (2.60)

$R^2 = .61$ *t-ratios in parentheses*

Where: EV = Market Value of Elevator
 CP = Bushel Capacity
 U200 = Dummy For Elevators With Capacities Under 200,000 Bushels
 O500 = Dummy For Elevators With Capacities Over 500,000 Bushels

This regression is used to estimate market values for existing elevators in North Dakota. In this regression, all variables are significant at the five percent level, except for U200 which has a t-ratio over 1. There were 68 observations used in this regression. The adjusted R^2 of .61 shows that sixty-one percent of the variation in elevator market values is explained by this regression.

These market values are used to estimate the annual opportunity cost of capital for these elevators. This is done by multiplying Moody's AAA Corporate Bond Rate by the estimated market value.

Since the market values are estimated from a representative sample of all elevators across North Dakota, depreciable fixed costs for new facilities should not be used in margin estimation. This is because the estimated market values take into account the new facilities as well as the old.

D. Turnover Calculation

The average turnover of the five sizes of elevators is calculated for 464 elevators across North Dakota in 1988 (Table 6).³ Some elevators in North Dakota are not used in this calculation, because data on both capacity and shipments from these elevators is not available.

TABLE 6: Average Turnovers In North Dakota (1988)		
Elevator Capacity	Mean Turnover	# of Observations
100,000	3.79	148
300,000	2.55	153
500,000	2.76	97
850,000	2.99	32
1,100,000	1.76	34

These turnovers are much smaller than the turnover of ten which was assumed by Chase and Helgeson (1983), and by this report thus far. The calculated turnovers are used to estimate margins.

³The five elevator sizes used represent ranges of elevator sizes. For the 100,000 bushel elevator the range is 0 to 199,000 bushels, for the 300,000 bushel elevator it is 200,000 to 399,000, for the 500,000 bushel elevator the range is 400,000 to 674,000, for the 850,000 bushel elevator it is 675,000 to 974,000, and for the 1,100,000 bushel capacity elevator the range is all elevators over 975,000 bushels of capacity.

E. Adjustment of Variable Costs to The 100,000 Bushel Capacity Elevator

In order to estimate variable costs for a 100,000 bushel capacity elevator in 1980, the following steps are made. First, variable costs are taken as 33% of the variable costs for a 300,000 bushel capacity elevator. This would represent the variable costs for a 100,000 bushel capacity elevator if economies of size were non-existent. Economies of size realized by the 300,000 bushel capacity elevator over the 100,000 bushel capacity elevator are assumed to be the same as those realized by a 500,000 bushel capacity elevator over the 300,000 bushel capacity elevator. An example of how economies of size are estimated is shown below.

1. 1980 Power Cost for a 500,000 Bushel Capacity Elevator = \$11,000
1980 Power Cost for a 300,000 Bushel Capacity Elevator = \$7,500
2. $\$11,000 * 60\% = \$6,600$
 $\$6,600 / \$7,500 = 88\%$
3. $\$7,500 * 33\% = \$2,475$
 $\$2,475 / 88\% = \$2,813$
 $\$2,813 = 1980 \text{ Power Cost for a } 100,000 \text{ Bushel Capacity Elevator}$

Nondepreciable fixed costs for a 100,000 bushel capacity elevator are estimated using the same method.

V. RESULTS

Average estimated margins for each state and elevator size for the years 1984 through 1988 are shown in Table 7. The variances from the mean of the estimates are shown in Table 8. The long run margin is the margin that must be charged in the long run and includes total costs plus an opportunity cost of capital. The short run margin is the margin that must be charged in the short run and includes variable costs only.

Zink points out that the actual value of the elevator may change rapidly if the

TABLE 7: Estimated Margins (1984-88 Avg.)

North Dakota, Minnesota, and South Dakota		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.179	.042
300,000	.184	.040
500,000	.145	.038
850,000	.106	.034
1,100,000	.141	.034
Washington and Idaho		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.170	.042
300,000	.174	.040
500,000	.138	.038
850,000	.101	.034
1,100,000	.134	.034
Montana, Wyoming, and Colorado		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.174	.042
300,000	.179	.040
500,000	.142	.038
850,000	.103	.034
1,100,000	.137	.034

TABLE 8: Variances From The Average of Estimated Margins		
North Dakota, South Dakota, and Minnesota		
Bushel Capacity	Long Run Variance	Short Run Variance
100,000	.00010970	.00001220
300,000	.00011180	.00001220
500,000	.00009770	.00001150
850,000	.00005330	.00001030
1,100,000	.00009500	.00001220
Washington and Idaho		
Bushel Capacity	Long Run Variance	Short Run Variance
100,000	.00009070	.00001220
300,000	.00010420	.00001220
500,000	.00008270	.00001150
850,000	.00005270	.00001030
1,100,000	.00008870	.00001220
Montana, Wyoming, and Colorado		
Bushel Capacity	Long Run Variance	Short Run Variance
100,000	.00010030	.00001220
300,000	.00009830	.00001220
500,000	.00009070	.00001150
850,000	.00005480	.00001030
1,100,000	.00008770	.00001220

competitive position of the operation changes in relation to surrounding firms. This could occur because of technological advances, or because of other actions by competing firms. Margins charged would vary because of this. Dooley and Wilson (1987) also argue that margins vary between firms in order to increase market areas. Since the concern here is to determine an average margin charged by grain elevators this will not be much of a concern. While some elevator's value may decrease, another's will increase.

VI. CONCLUSION

The estimation of a margin charged by grain elevators is of great importance in transportation and agriculture. Margins can be used as a link between market price and prices paid to producers.

By converting past cost estimates into current cost estimates, margins can be estimated. The margin will vary from a minimum of operating costs in the short run, to total annual costs plus an opportunity cost of capital in the long run.

The cost estimates in most studies are for new construction. This causes some problems in margin estimation, since many of the elevators currently operating are several years old. In order to deal with this problem some estimate of current market values must be made.

The methodology for using past cost estimates to estimate current margins is very simple, yet very important. With better information on current elevator values, increased accuracy can be obtained in margin estimation.

Appendix A

Table A1: Variable Costs For A 100,000 Bushel Capacity Elevator In 1984

Item Name	1980 Cst.	'84 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	3542	4044	987	1974	2960
Laborers	10677	12190	2974	5949	8923
Emp Ben	3697	4221	1030	2060	3090
Payroll Tax	1066	1217	368	736	1105
Unemp Comp	218	249	75	151	226
Office Supp	1040	1226	278	555	833
Elevator Supp	1497	1709	855	1709	2564
Power	2813	3212	1285	2569	3854
Telephone	1789	2108	1054	2108	3162
Subscriptions	83	98	22	44	66
Advertising	562	662	159	319	478
Special Meet	135	154	23	47	70
Travel & Con	465	531	80	160	241
Legal Fees	183	209	51	102	153
Rodent Cont	130	148	26	51	77
Tax & Div	116	132	32	65	97
Data Process	172	196	47	94	142
Grain Test/Weigh	8319	9498	4749	9498	14247
Workmen's Co	1073	1225	<u>371</u>	<u>741</u>	<u>1112</u>
Total Variable Costs			14466	28932	43399
Int. on Var. Cost (6Mo, 10.8%)			781	1562	2344
Interest on Gr Ha (15 days, 10.8%)			<u>7956</u>	<u>15913</u>	<u>23869</u>
Total Operating Cost			23204	46408	69612
			=====	=====	=====
Operating Cst per Bu.			.0464077	.0464077	.0464077

Table A2: Fixed Costs For A 100,000 Bushel Capacity Elevator In 1984

Nondepreciable Item Name	1980 Cst.	'84 Cst.	Annual Equiv. Cost (Int. Rt. = 10.8%)		
			Turn.5	Turn.10	Turn.15
Insurance	7846	8958	9926	9926	9926
Bonds	1010	1153	1278	1278	1278
Taxes	2056	2347	2601	2601	2601
Mgr. Salary	18022	20577	22799	22799	22799
Asst. Mgr. Sal	8366	9552	10583	10583	10583
Emp Ben	7764	8865	9822	9822	9822
Payroll Tax	1975	2255	2498	2498	2498
Unemp Comp	353	403	447	447	447
Workmen's Co	1733	1979	2192	2192	2192
Director Fees	371	424	469	469	469
Dues	115	131	145	145	145
Annual Meet	361	412	457	457	457
Warehouse Lic.	13	15	<u>16</u>	<u>16</u>	<u>16</u>
Tot Nondepreciable FC			63234	63234	63234
			=====	=====	=====
Ndeprec. FC per Bu.			.1264679	.0632340	.0421560

Table A3: Variable Costs For A 300,000 Bushel Capacity Elevator In 1984

Item Name	1980 Cst.	'84 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	8744	9983	2436	4872	7308
Laborers	29120	33248	8112	16225	24337
Emp Ben	9845	11241	2743	5485	8228
Payroll Tax	2840	3243	981	1962	2943
Unemp Comp	529	604	183	365	548
Office Supp	2750	3241	734	1468	2202
Elevator Supp	3500	3996	1998	3996	5994
Power	7500	8563	3425	6850	10276
Telephone	4645	5474	2737	5474	8211
Subscriptions	300	354	80	160	240
Advertising	1750	2062	496	992	1488
Special Meet	350	400	60	121	181
Travel & Con	1354	1546	233	467	700
Legal Fees	500	571	139	279	418
Rodent Cont	350	400	69	137	206
Tax & Div	325	371	91	181	272
Data Process	500	571	137	275	412
Grain Test/Weigh	25208	28781	14391	28781	43172
Workmen's Co	2600	2969	<u>898</u>	<u>1796</u>	<u>2694</u>
Total Variable Costs			39943	79886	119829
Int. on Var. Cost (6Mo, 10.8%)			2157	4314	6471
Interest on Gr Ha (15 days, 10.8%)			<u>23869</u>	<u>47739</u>	<u>71608</u>
Total Operating Cost			65969	131939	197908
			=====	=====	=====
Operating Cst per Bu.			.0439796	.0439796	.0439796

Table A4: Fixed Costs For A 300,000 Bushel Capacity Elevator In 1984

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.8%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Insurance	19258	21988	24363	24363	24363
Bonds	3060	3494	3871	3871	3871
Taxes	5091	5813	6440	6440	6440
Mgr. Salary	35747	40814	45222	45222	45222
Asst. Mgr. Sal	18500	21122	23404	23404	23404
Emp Ben	16003	18271	20245	20245	20245
Payroll Tax	4069	4646	5148	5148	5148
Unemp Comp	353	403	447	447	447
Workmen's Co	1733	1979	2192	2192	2192
Director Fees	900	1028	1139	1139	1139
Dues	250	285	316	316	316
Annual Meet	850	970	1075	1075	1075
Warehouse Lic.	39	45	49	49	49
Tot Nondepreciable FC			133910	133910	133910
			=====	=====	=====
Ndeprec. FC per Bu.			.0892735	.0446368	.0297578
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Land	10000	11417	1342	1342	1342
Elevator Struct.	735000	839186	104243	104243	104243
Driveway Struct.	420000	479535	59567	59567	59567
Elevator Mach.	450000	513787	92811	92811	92811
Dust Control	90000	102757	18575	18575	18575
Drier System	120000	137010	24767	24767	24767
Electrical	120000	137010	24767	24767	24767
Aeration and Temp	40000	45670	8256	8256	8256
RR Trackage	132590	151385	22286	22286	22286
Railcar Mover	43330	49472	11729	11729	11729
Office Bldg.	60000	68505	8515	8515	8515
Office Furniture	20000	22835	4128	4128	4128
Contingencies	150000	171262	30001	30001	30001
Total Depr. FC Per Yr.			410984	410984	410984
			=====	=====	=====
Total Depr. FC Per Bu.			.2739894	.1369947	.0913298

Table A5: Variable Costs For A 500,000 Bushel Capacity Elevator In 1984

Item Name	1980 Cst.	'84 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	11872	13555	3307	6615	9922
Laborers	43680	49872	12169	24337	36506
Emp Ben	14444	16491	4024	8048	12072
Payroll Tax	4166	4757	1439	2878	4317
Unemp Comp	706	806	244	488	732
Office Supp	4000	4714	1068	2135	3203
Elevator Supp	4500	5138	2569	5138	7707
Power	11000	12559	5024	10047	15071
Telephone	6635	7819	3909	7819	11728
Subscriptions	600	707	160	320	480
Advertising	3000	3535	850	1700	2551
Special Meet	500	571	86	172	259
Travel & Con	2167	2474	374	747	1121
Legal Fees	750	856	209	418	627
Rodent Cont	520	594	102	204	306
Tax & Div	500	571	139	279	418
Data Process	800	913	220	439	659
Grain Test/Weigh	42013	47968	23984	47968	71952
Workmen's Co	3466	3957	<u>1197</u>	<u>2394</u>	<u>3591</u>
Total Variable Costs			61074	122147	183221
Int. on Var. Cost (6Mo, 10.8%)			3298	6596	9894
Interest on Gr Ha (15 days, 10.8%)			<u>39782</u>	<u>79565</u>	<u>119347</u>
Total Operating Cost			104154	208308	312462
			=====	=====	=====
Operating Cst per Bu.			.0416616	.0416616	.0416616

Table A6: Fixed Costs For A 500,000 Bushel Capacity Elevator In 1984

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.8%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Insurance	25998	29683	32889	32889	32889
Bonds	5100	5823	6452	6452	6452
Taxes	6933	7916	8771	8771	8771
Mgr. Salary	38997	44525	49333	49333	49333
Asst. Mgr. Sal	22500	25689	28464	28464	28464
Emp Ben	18142	20714	22951	22951	22951
Payroll Tax	4612	5266	5834	5834	5834
Unemp Comp	353	403	447	447	447
Workmen's Co	1733	1979	2192	2192	2192
Director Fees	1200	1370	1518	1518	1518
Dues	300	343	380	380	380
Annual Meet	1100	1256	1392	1392	1392
Warehouse Lic.	65	74	82	82	82
Tot Nondepreciable FC			160704	160704	160704
			=====	=====	=====
Ndeprec. FC per Bu.			.0642817	.0321408	.0214272
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Land	20000	22835	2683	2683	2683
Elevator Struct.	1175000	1341556	166652	166652	166652
Driveway Struct.	420000	479535	59567	59567	59567
Elevator Mach.	550000	627962	113322	113322	113322
Dust Control	125000	142719	25767	25767	25767
Drier System	120000	137010	24767	24767	24767
Electrical	150000	171262	30894	30894	30894
Aeration and Temp	50000	57087	10319	10319	10319
RR Trackage	265180	302769	44547	44547	44547
Railcar Mover	43330	49472	11729	11729	11729
Office Bldg.	60000	68505	8528	8528	8528
Office Furniture	20000	22835	4128	4128	4128
Contingencies	200000	228350	40002	40002	40002
Total Depr. FC Per Yr.			542904	542904	542904
			=====	=====	=====
Total Depr. FC Per Bu.			.2171616	.1085808	.0723872

Table A7: Variable Costs For A 850,000 Bushel Capacity Elevator In 1984

Item Name	1980 Cst.	'84 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	14677	16757	4089	8178	12266
Laborers	58240	66496	16225	32450	48675
Emp Ben	18958	21645	5281	10563	15844
Payroll Tax	5469	6244	1889	3778	5667
Unemp Comp	882	1007	305	609	914
Office Supp	5250	6187	1401	2803	4204
Elevator Supp	6000	6850	3425	6850	10276
Power	15000	17126	6850	13701	20551
Telephone	8626	10165	5082	10165	15247
Subscriptions	850	1002	227	454	681
Advertising	3500	4124	992	1984	2976
Special Meet	750	856	129	259	388
Travel & Con	2709	3093	467	934	1401
Legal Fees	1000	1142	279	557	836
Rodent Cont	700	799	137	275	412
Tax & Div	750	856	209	418	627
Data Process	1250	1427	343	686	1030
Grain Test/Weigh	71429	81554	40777	81554	122331
Workmen's Co	4333	4947	<u>1497</u>	<u>2993</u>	<u>4490</u>
Total Variable Costs			89605	179210	268815
Int. on Var. Cost (6Mo, 10.8%)			4839	9677	14516
Interest on Gr Ha (15 days, 10.8%)			<u>67630</u>	<u>135260</u>	<u>202890</u>
Total Operating Cost			162074	324147	486221
			=====	=====	=====
Operating Cst per Bu.			.0381350	.0381350	.0381350

Table A8: Fixed Costs For A 850,000 Bushel Capacity Elevator In 1984

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.8%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Insurance	38049	43442	48134	48134	48134
Bonds	5810	6634	7350	7350	7350
Taxes	9672	11043	12236	12236	12236
Mgr. Salary	45497	51946	57556	57556	57556
Asst. Mgr. Sal	25000	28544	31626	31626	31626
Emp Ben	20797	23745	26309	26309	26309
Payroll Tax	5287	6036	6688	6688	6688
Unemp Comp	353	403	447	447	447
Workmen's Co	1733	1979	2192	2192	2192
Director Fees	1600	1827	2024	2024	2024
Dues	400	457	506	506	506
Annual Meet	1500	1713	1898	1898	1898
Warehouse Lic.	78	89	99	99	99
Tot Nondepreciable FC			197066	197066	197066
			=====	=====	=====
Ndeprec. FC per Bu.			.0463684	.0231842	.0154561
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	45670	5366	5366	5366
Elevator Struct.	1912000	2183025	271294	271294	271294
Driveway Struct.	420000	479535	59695	59695	59695
Elevator Mach.	750000	856312	154599	154599	154599
Dust Control	150000	171262	30920	30920	30920
Drier System	150000	171262	30920	30920	30920
Electrical	180000	205515	37086	37086	37086
Aeration and Temp	100000	114175	20613	20613	20613
RR Trackage	265180	302769	44547	44547	44547
Railcar Mover	43330	49472	11729	11729	11729
Office Bldg.	105000	119884	14892	14892	14892
Office Furniture	30000	34252	6192	6192	6192
Contingencies	250000	285437	50002	50002	50002
Total Depr. FC Per Yr.			737854	737854	737854
			=====	=====	=====
Total Depr. FC Per Bu.			.1736128	.0868064	.0578709

Table A9: Variable Costs For A 1,100,000 Bushel Capacity Elevator In 1984

Item Name	1980 Cst.	'84 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	17488	19967	4872	9744	14616
Laborers	76960	87869	21440	42880	64320
Emp Ben	24556	28037	6841	13682	20523
Payroll Tax	7084	8088	2447	4893	7340
Unemp Comp	1058	1208	365	731	1096
Office Supp	6500	7660	1735	3470	5205
Elevator Supp	7500	8563	4282	8563	12845
Power	18000	20551	8221	16441	24662
Telephone	11943	14074	7037	14074	21111
Subscriptions	1000	1178	267	534	801
Advertising	4000	4714	1134	2267	3401
Special Meet	1000	1142	172	345	517
Travel & Con	3521	4020	607	1214	1821
Legal Fees	1300	1484	362	724	1086
Rodent Cont	850	970	167	334	501
Tax & Div	1000	1142	279	557	836
Data Process	1750	1998	481	961	1442
Grain Test/Weigh	92438	105541	52771	105541	158312
Workmen's Co	5200	5937	<u>1796</u>	<u>3592</u>	<u>5388</u>
Total Variable Costs			115274	230547	345821
Int. on Var. Cost (6Mo, 10.8%)			6225	12450	18674
Interest on Gr Ha (15 days, 10.8%)			<u>87521</u>	<u>175042</u>	<u>262563</u>
Total Operating Cost			209019	418039	627058
			=====	=====	=====
Operating Cst per Bu.			.0380035	.0380035	.0380035

Table A10: Fixed Costs For A 1,100,000 Bushel Capacity Elevator In 1984

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.8%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Insurance	46468	53055	58785	58785	58785
Bonds	6320	7216	7995	7995	7995
Taxes	11429	13049	14458	14458	14458
Mgr. Salary	51996	59366	65778	65778	65778
Asst. Mgr. Sal	27500	31398	34789	34789	34789
Emp Ben	23451	26775	29667	29667	29667
Payroll Tax	5962	6807	7542	7542	7542
Unemp Comp	353	403	447	447	447
Workmen's Co	1733	1979	2192	2192	2192
Director Fees	1600	1827	2024	2024	2024
Dues	400	457	506	506	506
Annual Meet	1500	1713	1898	1898	1898
Warehouse Lic.	78	89	99	99	99
Tot Nondepreciable FC			226180	226180	226180
			=====	=====	=====
Ndeprec. FC per Bu.			.0411236	.0205618	.0137079
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'84 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	45670	5366	5366	5366
Elevator Struct.	2365000	2700238	335596	335596	335596
Driveway Struct.	420000	479535	59695	59695	59695
Elevator Mach.	1000000	1141750	206132	206132	206132
Dust Control	175000	199806	36073	36073	36073
Drier System	150000	171262	30920	30920	30920
Electrical	190000	216932	39150	39150	39150
Aeration and Temp	130000	148427	26767	26767	26767
RR Trackage	265180	302769	44547	44547	44547
Railcar Mover	43330	49472	11729	11729	11729
Office Bldg.	105000	119884	14892	14892	14892
Office Furniture	30000	34252	6192	6192	6192
Contingencies	275000	313981	55002	55002	55002
Total Depr. FC Per Yr.			872060	872060	872060
			=====	=====	=====
Total Depr. FC Per Bu.			.1585564	.0792782	.0528521

Table A11: Variable Costs For A 100,000 Bushel Capacity Elevator In 1985

Item Name	1980 Cst.	'85 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	3542	4028	983	1966	2949
Laborers	10677	12143	2963	5926	8889
Emp Ben	3697	4205	1026	2052	3078
Payroll Tax	1066	1212	367	733	1100
Unemp Comp	218	248	75	150	225
Office Supp	1040	1237	280	561	841
Elevator Supp	1497	1703	851	1703	2554
Power	2813	3199	1280	2559	3839
Telephone	1789	2129	1064	2129	3193
Subscriptions	83	99	22	45	67
Advertising	562	669	161	322	482
Special Meet	135	154	23	46	70
Travel & Con	465	529	80	160	240
Legal Fees	183	208	51	102	152
Rodent Cont	130	148	25	51	76
Tax & Div	116	132	32	64	97
Data Process	172	196	47	94	141
Grain Test/Weigh	8319	9461	4731	9461	14192
Workmen's Co	1073	1220	<u>369</u>	<u>738</u>	<u>1107</u>
Total Variable Costs			14431	28861	43292
Int. on Var. Cost (6Mo, 10.25%)			740	1479	2219
Interest on Gr Ha (15 days, 10.25%)			<u>6763</u>	<u>13527</u>	<u>20290</u>
Total Operating Cost			21933	43867	65800
			=====	=====	=====
Operating Cst per Bu.			.0438670	.0438670	.0438670

Table A12: Fixed Costs For A 100,000 Bushel Capacity Elevator In 1985

Nondepreciable Item Name	1980 Cst.	'85 Cst.	Annual Equiv. Cost (Int. Rt. = 10.25%)		
			Turn.5	Turn.10	Turn.15
Insurance	7846	8923	9838	9838	9838
Bonds	1010	1149	1266	1266	1266
Taxes	2056	2338	2578	2578	2578
Mgr. Salary	18022	20497	22598	22598	22598
Asst. Mgr. Sal	8366	9515	10490	10490	10490
Emp Ben	7764	8830	9735	9735	9735
Payroll Tax	1975	2246	2476	2476	2476
Unemp Comp	353	401	443	443	443
Workmen's Co	1733	1971	2173	2173	2173
Director Fees	371	422	465	465	465
Dues	115	131	144	144	144
Annual Meet	361	411	453	453	453
Warehouse Lic.	13	15	<u>16</u>	<u>16</u>	<u>16</u>
Tot Nondepreciable FC			62676	62676	62676
			=====	=====	=====
Ndeprec. FC per Bu.			.1253519	.0626760	.0417840

Table A13: Variable Costs For A 300,000 Bushel Capacity Elevator In 1985

Item Name	1980 Cst.	'85 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	8744	9945	2427	4853	7280
Laborers	29120	33119	8081	16162	24243
Emp Ben	9845	11197	2732	5464	8196
Payroll Tax	2840	3230	977	1954	2931
Unemp Comp	529	602	182	364	546
Office Supp	2750	3272	741	1482	2223
Elevator Supp	3500	3981	1990	3981	5971
Power	7500	8530	3412	6824	10236
Telephone	4645	5526	2763	5526	8290
Subscriptions	300	357	81	162	243
Advertising	1750	2082	501	1001	1502
Special Meet	350	398	60	120	180
Travel & Con	1354	1540	233	465	698
Legal Fees	500	569	139	278	416
Rodent Cont	350	398	68	137	205
Tax & Div	325	370	90	180	271
Data Process	500	569	137	274	410
Grain Test/Weigh	25208	28670	14335	28670	43004
Workmen's Co	2600	2957	<u>895</u>	<u>1789</u>	<u>2684</u>
Total Variable Costs			39843	79686	119529
Int. on Var. Cost (6Mo, 10.25%)			2042	4084	6126
Interest on Gr Ha (15 days, 10.25%)			<u>20290</u>	<u>40580</u>	<u>60870</u>
Total Operating Cost			62175	124350	186525
			=====	=====	=====
Operating Cst per Bu.			.0414499	.0414499	.0414499

Table A14: Fixed Costs For A 300,000 Bushel Capacity Elevator In 1985

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.25%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Insurance	19258	21903	24148	24148	24148
Bonds	3060	3480	3837	3837	3837
Taxes	5091	5790	6384	6384	6384
Mgr. Salary	35747	40656	44823	44823	44823
Asst. Mgr. Sal	18500	21040	23197	23197	23197
Emp Ben	16003	18201	20066	20066	20066
Payroll Tax	4069	4628	5102	5102	5102
Unemp Comp	353	401	443	443	443
Workmen's Co	1733	1971	2173	2173	2173
Director Fees	900	1024	1129	1129	1129
Dues	250	284	313	313	313
Annual Meet	850	967	1066	1066	1066
Warehouse Lic.	39	44	49	49	49
Tot Nondepreciable FC			132729	132729	132729
			=====	=====	=====
Ndeprec. FC per Bu.			.0884857	.0442429	.0294952
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Land	10000	11373	1336	1336	1336
Elevator Struct.	735000	835930	103838	103838	103838
Driveway Struct.	420000	477674	59336	59336	59336
Elevator Mach.	450000	511794	92451	92451	92451
Dust Control	90000	102359	18503	18503	18503
Drier System	120000	136478	24670	24670	24670
Electrical	120000	136478	24670	24670	24670
Aeration and Temp	40000	45493	8223	8223	8223
RR Trackage	132590	150797	22200	22200	22200
Railcar Mover	43330	49280	11683	11683	11683
Office Bldg.	60000	68239	8482	8482	8482
Office Furniture	20000	22746	4112	4112	4112
Contingencies	150000	170598	29885	29885	29885
Total Depr. FC Per Yr.			409390	409390	409390
			=====	=====	=====
Total Depr. FC Per Bu.			.2729264	.1364632	.0909755

Table A15: Variable Costs For A 500,000 Bushel Capacity Elevator In 1985

Item Name	1980 Cst.	'85 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	11872	13502	3295	6589	9884
Laborers	43680	49678	12121	24243	36364
Emp Ben	14444	16427	4008	8017	12025
Payroll Tax	4166	4738	1433	2867	4300
Unemp Comp	706	803	243	486	729
Office Supp	4000	4759	1078	2156	3234
Elevator Supp	4500	5118	2559	5118	7677
Power	11000	12511	5004	10008	15013
Telephone	6635	7894	3947	7894	11841
Subscriptions	600	714	162	323	485
Advertising	3000	3569	858	1717	2575
Special Meet	500	569	86	172	258
Travel & Con	2167	2465	372	744	1116
Legal Fees	750	853	208	416	624
Rodent Cont	520	591	102	203	305
Tax & Div	500	569	139	278	416
Data Process	800	910	219	438	656
Grain Test/Weigh	42013	47782	23891	47782	71673
Workmen's Co	3466	3942	<u>1192</u>	<u>2385</u>	<u>3577</u>
Total Variable Costs			60918	121836	182753
Int. on Var. Cost (6Mo, 10.25%)			3122	6244	9366
Interest on Gr Ha (15 days, 10.25%)			<u>33817</u>	<u>67634</u>	<u>101450</u>
Total Operating Cost			97857	195713	293570
			=====	=====	=====
Operating Cst per Bu.			.0391426	.0391426	.0391426

Table A16: Fixed Costs For A 500,000 Bushel Capacity Elevator In 1985

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.25%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Insurance	25998	29568	32599	32599	32599
Bonds	5100	5800	6395	6395	6395
Taxes	6933	7885	8693	8693	8693
Mgr. Salary	38997	44352	48898	48898	48898
Asst. Mgr. Sal	22500	25590	28213	28213	28213
Emp Ben	18142	20633	22748	22748	22748
Payroll Tax	4612	5245	5783	5783	5783
Unemp Comp	353	401	443	443	443
Workmen's Co	1733	1971	2173	2173	2173
Director Fees	1200	1365	1505	1505	1505
Dues	300	341	376	376	376
Annual Meet	1100	1251	1379	1379	1379
Warehouse Lic.	65	74	82	82	82
Tot Nondepreciable FC			159286	159286	159286
			=====	=====	=====
Ndeprec. FC per Bu.			.0637144	.0318572	.0212381
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Land	20000	22746	2673	2673	2673
Elevator Struct.	1175000	1336351	166006	166006	166006
Driveway Struct.	420000	477674	59336	59336	59336
Elevator Mach.	550000	625526	112882	112882	112882
Dust Control	125000	142165	25667	25667	25667
Drier System	120000	136478	24670	24670	24670
Electrical	150000	170598	30774	30774	30774
Aeration and Temp	50000	56866	10279	10279	10279
RR Trackage	265180	301595	44374	44374	44374
Railcar Mover	43330	49280	11683	11683	11683
Office Bldg.	60000	68239	8495	8495	8495
Office Furniture	20000	22746	4112	4112	4112
Contingencies	200000	227464	39846	39846	39846
Total Depr. FC Per Yr.			540798	540798	540798
			=====	=====	=====
Total Depr. FC Per Bu.			.2163191	.1081595	.0721064

Table A17: Variable Costs For A 850,000 Bushel Capacity Elevator In 1985

Item Name	1980 Cst.	'85 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	14677	16692	4073	8146	12219
Laborers	58240	66238	16162	32324	48486
Emp Ben	18958	21561	5261	10522	15783
Payroll Tax	5469	6220	1882	3763	5645
Unemp Comp	882	1003	303	607	910
Office Supp	5250	6246	1415	2830	4244
Elevator Supp	6000	6824	3412	6824	10236
Power	15000	17060	6824	13648	20472
Telephone	8626	10263	5131	10263	15394
Subscriptions	850	1011	229	458	687
Advertising	3500	4164	1001	2003	3004
Special Meet	750	853	129	258	386
Travel & Con	2709	3081	465	930	1396
Legal Fees	1000	1137	278	555	833
Rodent Cont	700	796	137	274	411
Tax & Div	750	853	208	416	624
Data Process	1250	1422	342	684	1026
Grain Test/Weigh	71429	81238	40619	81238	121856
Workmen's Co	4333	4928	<u>1491</u>	<u>2981</u>	<u>4472</u>
Total Variable Costs			89362	178723	268085
Int. on Var. Cost (6Mo, 10.25%)			4580	9160	13739
Interest on Gr Ha (15 days, 10.25%)			<u>57489</u>	<u>114977</u>	<u>172466</u>
Total Operating Cost			151430	302860	454290
			=====	=====	=====
Operating Cst per Bu.			.0356306	.0356306	.0356306

Table A18: Fixed Costs For A 850,000 Bushel Capacity Elevator In 1985

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.25%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Insurance	38049	43274	47709	47709	47709
Bonds	5810	6608	7285	7285	7285
Taxes	9672	11000	12128	12128	12128
Mgr. Salary	45497	51745	57048	57048	57048
Asst. Mgr. Sal	25000	28433	31347	31347	31347
Emp Ben	20797	23653	26077	26077	26077
Payroll Tax	5287	6013	6629	6629	6629
Unemp Comp	353	401	443	443	443
Workmen's Co	1733	1971	2173	2173	2173
Director Fees	1600	1820	2006	2006	2006
Dues	400	455	502	502	502
Annual Meet	1500	1706	1881	1881	1881
Warehouse Lic.	78	89	98	98	98
Tot Nondepreciable FC			195327	195327	195327
			=====	=====	=====
Ndeprec. FC per Bu.			.0459592	.0229796	.0153197
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	45493	5345	5345	5345
Elevator Struct.	1912000	2174556	270241	270241	270241
Driveway Struct.	420000	477674	59463	59463	59463
Elevator Mach.	750000	852990	154000	154000	154000
Dust Control	150000	170598	30800	30800	30800
Drier System	150000	170598	30800	30800	30800
Electrical	180000	204718	36942	36942	36942
Aeration and Temp	100000	113732	20533	20533	20533
RR Trackage	265180	301595	44374	44374	44374
Railcar Mover	43330	49280	11683	11683	11683
Office Bldg.	105000	119419	14834	14834	14834
Office Furniture	30000	34120	6168	6168	6168
Contingencies	250000	284330	49808	49808	49808
Total Depr. FC Per Yr.			734992	734992	734992
			=====	=====	=====
Total Depr. FC Per Bu.			.1729392	.0864696	.0576464

Table A19: Variable Costs For A 1,100,000 Bushel Capacity Elevator In 1985

Item Name	1980 Cst.	'85 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	17488	19889	4853	9706	14559
Laborers	76960	87528	21357	42714	64071
Emp Ben	24556	27928	6814	13629	20443
Payroll Tax	7084	8057	2437	4874	7312
Unemp Comp	1058	1203	364	728	1092
Office Supp	6500	7734	1752	3503	5255
Elevator Supp	7500	8530	4265	8530	12795
Power	18000	20472	8189	16377	24566
Telephone	11943	14209	7105	14209	21314
Subscriptions	1000	1190	269	539	808
Advertising	4000	4759	1145	2289	3434
Special Meet	1000	1137	172	343	515
Travel & Con	3521	4005	605	1209	1814
Legal Fees	1300	1479	361	722	1082
Rodent Cont	850	967	166	333	499
Tax & Div	1000	1137	278	555	833
Data Process	1750	1990	479	957	1436
Grain Test/Weigh	92438	105132	52566	105132	157697
Workmen's Co	5200	5914	<u>1789</u>	<u>3578</u>	<u>5367</u>
Total Variable Costs			114964	229928	344892
Int. on Var. Cost (6Mo, 10.25%)			5892	11784	17676
Interest on Gr Ha (15 days, 10.25%)			<u>74397</u>	<u>148794</u>	<u>223191</u>
Total Operating Cost			195253	390506	585758
			=====	=====	=====
Operating Cst per Bu.			.0355005	.0355005	.0355005

Table A20: Fixed Costs For A 1,100,000 Bushel Capacity Elevator In 1985

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 10.25%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Insurance	46468	52849	58266	58266	58266
Bonds	6320	7188	7925	7925	7925
Taxes	11429	12998	14331	14331	14331
Mgr. Salary	51996	59136	65198	65198	65198
Asst. Mgr. Sal	27500	31276	34482	34482	34482
Emp Ben	23451	26671	29405	29405	29405
Payroll Tax	5962	6781	7476	7476	7476
Unemp Comp	353	401	443	443	443
Workmen's Co	1733	1971	2173	2173	2173
Director Fees	1600	1820	2006	2006	2006
Dues	400	455	502	502	502
Annual Meet	1500	1706	1881	1881	1881
Warehouse Lic.	78	89	98	98	98
Tot Nondepreciable FC			224184	224184	224184
			=====	=====	=====
Ndeprec. FC per Bu.			.0407607	.0203804	.0135869
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.75%)		
Item Name	1980 Cst.	'85 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	45493	5345	5345	5345
Elevator Struct.	2365000	2689762	334294	334294	334294
Driveway Struct.	420000	477674	59463	59463	59463
Elevator Mach.	1000000	1137320	205333	205333	205333
Dust Control	175000	199031	35933	35933	35933
Drier System	150000	170598	30800	30800	30800
Electrical	190000	216091	38998	38998	38998
Aeration and Temp	130000	147852	26663	26663	26663
RR Trackage	265180	301595	44374	44374	44374
Railcar Mover	43330	49280	11683	11683	11683
Office Bldg.	105000	119419	14834	14834	14834
Office Furniture	30000	34120	6168	6168	6168
Contingencies	275000	312763	54789	54789	54789
Total Depr. FC Per Yr.			868677	868677	868677
			=====	=====	=====
Total Depr. FC Per Bu.			.1579413	.0789706	.0526471

Table A21: Variable Costs For A 100,000 Bushel Capacity Elevator In 1986

Item Name	1980 Cst.	'86 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	3542	3887	948	1897	2845
Laborers	10677	11718	2859	5718	8577
Emp Ben	3697	4057	990	1980	2970
Payroll Tax	1066	1170	354	708	1062
Unemp Comp	218	239	72	145	217
Office Supp	1040	1220	276	552	829
Elevator Supp	1497	1643	821	1643	2464
Power	2813	3087	1235	2470	3705
Telephone	1789	2098	1049	2098	3147
Subscriptions	83	97	22	44	66
Advertising	562	659	159	317	476
Special Meet	135	148	22	45	67
Travel & Con	465	510	77	154	231
Legal Fees	183	201	49	98	147
Rodent Cont	130	143	25	49	74
Tax & Div	116	127	31	62	93
Data Process	172	189	45	91	136
Grain Test/Weigh	8319	9130	4565	9130	13695
Workmen's Co	1073	1178	<u>356</u>	<u>712</u>	<u>1069</u>
Total Variable Costs			13956	27913	41869
Int. on Var. Cost (6Mo, 8.7%)			607	1214	1821
Interest on Gr Ha (15 days, 8.7%)			<u>4629</u>	<u>9258</u>	<u>13887</u>
Total Operating Cost			19192	38385	57577
			=====	=====	=====
Operating Cst per Bu.			.0383850	.0383850	.0383850

Table A22: Fixed Costs For A 100,000 Bushel Capacity Elevator In 1986

Nondepreciable Item Name	1980 Cst.	'86 Cst.	Annual Equiv. Cost (Int. Rt. = 8.6%)		
			Turn.5	Turn.10	Turn.15
Insurance	7846	8611	9351	9351	9351
Bonds	1010	1108	1204	1204	1204
Taxes	2056	2256	2450	2450	2450
Mgr. Salary	18022	19778	21479	21479	21479
Asst. Mgr. Sal	8366	9181	9971	9971	9971
Emp Ben	7764	8521	9253	9253	9253
Payroll Tax	1975	2167	2354	2354	2354
Unemp Comp	353	387	421	421	421
Workmen's Co	1733	1902	2065	2065	2065
Director Fees	371	407	442	442	442
Dues	115	126	137	137	137
Annual Meet	361	396	430	430	430
Warehouse Lic.	13	14	<u>15</u>	<u>15</u>	<u>15</u>
Tot Nondepreciable FC			59574	59574	59574
			=====	=====	=====
Ndeprec. FC per Bu.			.1191476	.0595738	.0397159

Table A23: Variable Costs For A 300,000 Bushel Capacity Elevator In 1986

Item Name	1980 Cst.	'86 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	8744	9596	2341	4683	7024
Laborers	29120	31958	7798	15595	23393
Emp Ben	9845	10804	2636	5273	7909
Payroll Tax	2840	3117	943	1886	2828
Unemp Comp	529	581	176	351	527
Office Supp	2750	3225	730	1461	2191
Elevator Supp	3500	3841	1921	3841	5762
Power	7500	8231	3292	6585	9877
Telephone	4645	5447	2724	5447	8171
Subscriptions	300	352	80	159	239
Advertising	1750	2052	494	987	1481
Special Meet	350	384	58	116	174
Travel & Con	1354	1486	224	449	673
Legal Fees	500	549	134	268	402
Rodent Cont	350	384	66	132	198
Tax & Div	325	357	87	174	261
Data Process	500	549	132	264	396
Grain Test/Weigh	25208	27665	13832	27665	41497
Workmen's Co	2600	2853	<u>863</u>	<u>1726</u>	<u>2589</u>
Total Variable Costs			38531	77062	115593
Int. on Var. Cost (6Mo, 8.7%)			1676	3352	5028
Interest on Gr Ha (15 days, 8.7%)			<u>13887</u>	<u>27774</u>	<u>41661</u>
Total Operating Cost			54094	108188	162282
			=====	=====	=====
Operating Cst per Bu.			.0360627	.0360627	.0360627

Table A24: Fixed Costs For A 300,000 Bushel Capacity Elevator In 1986

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.6%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Insurance	19258	21135	22952	22952	22952
Bonds	3060	3358	3647	3647	3647
Taxes	5091	5587	6068	6068	6068
Mgr. Salary	35747	39231	42604	42604	42604
Asst. Mgr. Sal	18500	20303	22049	22049	22049
Emp Ben	16003	17563	19073	19073	19073
Payroll Tax	4069	4466	4850	4850	4850
Unemp Comp	353	387	421	421	421
Workmen's Co	1733	1902	2065	2065	2065
Director Fees	900	988	1073	1073	1073
Dues	250	274	298	298	298
Annual Meet	850	933	1013	1013	1013
Warehouse Lic.	39	43	46	46	46
Tot Nondepreciable FC			126159	126159	126159
			=====	=====	=====
Ndeprec. FC per Bu.			.0841061	.0420531	.0280354

Depreciable			Annual Equiv. Cost (Int. Rt. = 11.06%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Land	10000	10975	1214	1214	1214
Elevator Struct.	735000	806628	94843	94843	94843
Driveway Struct.	420000	460930	54196	54196	54196
Elevator Mach.	450000	493854	86750	86750	86750
Dust Control	90000	98771	17362	17362	17362
Drier System	120000	131694	23149	23149	23149
Electrical	120000	131694	23149	23149	23149
Aeration and Temp	40000	43898	7716	7716	7716
RR Trackage	132590	145511	20435	20435	20435
Railcar Mover	43330	47553	11020	11020	11020
Office Bldg.	60000	65847	7747	7747	7747
Office Furniture	20000	21949	3858	3858	3858
Contingencies	150000	164618	28023	28023	28023
Total Depr. FC Per Yr.			379463	379463	379463
			=====	=====	=====
Total Depr. FC Per Bu.			.2529751	.1264876	.0843250

Table 25: Variable Costs For A 500,000 Bushel Capacity Elevator In 1986

Item Name	1980 Cst.	'86 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	11872	13029	3179	6358	9537
Laborers	43680	47937	11697	23393	35090
Emp Ben	14444	15852	3868	7736	11603
Payroll Tax	4166	4572	1383	2766	4149
Unemp Comp	706	775	234	469	703
Office Supp	4000	4691	1062	2125	3187
Elevator Supp	4500	4939	2469	4939	7408
Power	11000	12072	4829	9658	14486
Telephone	6635	7781	3891	7781	11672
Subscriptions	600	704	159	319	478
Advertising	3000	3518	846	1692	2538
Special Meet	500	549	83	166	249
Travel & Con	2167	2378	359	718	1077
Legal Fees	750	823	201	402	603
Rodent Cont	520	571	98	196	294
Tax & Div	500	549	134	268	402
Data Process	800	878	211	422	633
Grain Test/Weigh	42013	46107	23054	46107	69161
Workmen's Co	3466	3804	<u>1151</u>	<u>2301</u>	<u>3452</u>
Total Variable Costs			58908	117815	176723
Int. on Var. Cost (6Mo, 8.7%)			2562	5125	7687
Interest on Gr Ha (15 days, 8.7%)			<u>23145</u>	<u>46290</u>	<u>69435</u>
Total Operating Cost			84615	169230	253845
			=====	=====	=====
Operating Cst per Bu.			.0338460	.0338460	.0338460

Table A26: Fixed Costs For A 500,000 Bushel Capacity Elevator In 1986

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.6%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Insurance	25998	28532	30985	30985	30985
Bonds	5100	5597	6078	6078	6078
Taxes	6933	7609	8263	8263	8263
Mgr. Salary	38997	42797	46478	46478	46478
Asst. Mgr. Sal	22500	24693	26816	26816	26816
Emp Ben	18142	19910	21622	21622	21622
Payroll Tax	4612	5061	5497	5497	5497
Unemp Comp	353	387	421	421	421
Workmen's Co	1733	1902	2065	2065	2065
Director Fees	1200	1317	1430	1430	1430
Dues	300	329	358	358	358
Annual Meet	1100	1207	1311	1311	1311
Warehouse Lic.	65	71	<u>77</u>	<u>77</u>	<u>77</u>
Tot Nondepreciable FC			151402	151402	151402
			=====	=====	=====
Ndeprec. FC per Bu.			.0605609	.0302804	.0201870
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.06%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Land	20000	21949	2428	2428	2428
Elevator Struct.	1175000	1289507	151625	151625	151625
Driveway Struct.	420000	460930	54196	54196	54196
Elevator Mach.	550000	603599	105919	105919	105919
Dust Control	125000	137182	24084	24084	24084
Drier System	120000	131694	23149	23149	23149
Electrical	150000	164618	28876	28876	28876
Aeration and Temp	50000	54873	9646	9646	9646
RR Trackage	265180	291023	40845	40845	40845
Railcar Mover	43330	47553	11020	11020	11020
Office Bldg.	60000	65847	7760	7760	7760
Office Furniture	20000	21949	3858	3858	3858
Contingencies	200000	219491	<u>37364</u>	<u>37364</u>	<u>37364</u>
Total Depr. FC Per Yr.			500769	500769	500769
			=====	=====	=====
Total Depr. FC Per Bu.			.2003075	.1001537	.0667692

Table A27: Variable Costs For A 850,000 Bushel Capacity Elevator In 1986

Item Name	1980 Cst.	'86 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	14677	16107	3930	7860	11791
Laborers	58240	63916	15595	31191	46786
Emp Ben	18958	20806	5077	10153	15230
Payroll Tax	5469	6002	1816	3631	5447
Unemp Comp	882	968	293	586	878
Office Supp	5250	6157	1395	2789	4184
Elevator Supp	6000	6585	3292	6585	9877
Power	15000	16462	6585	13169	19754
Telephone	8626	10116	5058	10116	15174
Subscriptions	850	997	226	452	677
Advertising	3500	4105	987	1974	2961
Special Meet	750	823	124	249	373
Travel & Con	2709	2973	449	898	1347
Legal Fees	1000	1097	268	536	803
Rodent Cont	700	768	132	264	396
Tax & Div	750	823	201	402	603
Data Process	1250	1372	330	660	990
Grain Test/Weigh	71429	78390	39195	78390	117585
Workmen's Co	4333	4755	<u>1438</u>	<u>2877</u>	<u>4315</u>
Total Variable Costs			86390	172781	259171
Int. on Var. Cost (6Mo, 8.7%)			3758	7516	11274
Interest on Gr Ha (15 days, 8.7%)			<u>39346</u>	<u>78693</u>	<u>118039</u>
Total Operating Cost			129495	258989	388484
			=====	=====	=====
Operating Cst per Bu.			.0304694	.0304694	.0304694

Table A28: Fixed Costs For A 850,000 Bushel Capacity Elevator In 1986

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.6%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Insurance	38049	41757	45348	45348	45348
Bonds	5810	6376	6925	6925	6925
Taxes	9672	10615	11527	11527	11527
Mgr. Salary	45497	49931	54225	54225	54225
Asst. Mgr. Sal	25000	27436	29796	29796	29796
Emp Ben	20797	22824	24787	24787	24787
Payroll Tax	5287	5802	6301	6301	6301
Unemp Comp	353	387	421	421	421
Workmen's Co	1733	1902	2065	2065	2065
Director Fees	1600	1756	1907	1907	1907
Dues	400	439	477	477	477
Annual Meet	1500	1646	1788	1788	1788
Warehouse Lic.	78	86	93	93	93
Tot Nondepreciable FC			185659	185659	185659
			=====	=====	=====
Ndeprec. FC per Bu.			.0436845	.0218422	.0145615
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.06%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	43898	4855	4855	4855
Elevator Struct.	1912000	2098330	246836	246836	246836
Driveway Struct.	420000	460930	54318	54318	54318
Elevator Mach.	750000	823090	144501	144501	144501
Dust Control	150000	164618	28900	28900	28900
Drier System	150000	164618	28900	28900	28900
Electrical	180000	197542	34663	34663	34663
Aeration and Temp	100000	109745	19267	19267	19267
RR Trackage	265180	291023	40845	40845	40845
Railcar Mover	43330	47553	11020	11020	11020
Office Bldg.	105000	115233	13549	13549	13549
Office Furniture	30000	32924	5787	5787	5787
Contingencies	250000	274363	46705	46705	46705
Total Depr. FC Per Yr.			680147	680147	680147
			=====	=====	=====
Total Depr. FC Per Bu.			.1600346	.0800173	.0533449

Table A29: Variable Costs For A 1,100,000 Bushel Capacity Elevator In 1986

Item Name	1980 Cst.	'86 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	17488	19192	4683	9366	14049
Laborers	76960	84460	20608	41216	61825
Emp Ben	24556	26949	6576	13151	19727
Payroll Tax	7084	7774	2352	4703	7055
Unemp Comp	1058	1161	351	702	1054
Office Supp	6500	7623	1727	3453	5180
Elevator Supp	7500	8231	4115	8231	12346
Power	18000	19754	7902	15803	23705
Telephone	11943	14006	7003	14006	21009
Subscriptions	1000	1173	266	531	797
Advertising	4000	4691	1128	2256	3384
Special Meet	1000	1097	166	331	497
Travel & Con	3521	3864	583	1167	1750
Legal Fees	1300	1427	348	696	1044
Rodent Cont	850	933	160	321	481
Tax & Div	1000	1097	268	536	803
Data Process	1750	1921	462	924	1386
Grain Test/Weigh	92438	101446	50723	101446	152170
Workmen's Co	5200	5707	<u>1726</u>	<u>3453</u>	<u>5179</u>
Total Variable Costs			111147	222294	333441
Int. on Var. Cost (6Mo, 8.7%)			4835	9670	14505
Interest on Gr Ha (15 days, 8.7%)			<u>50919</u>	<u>101838</u>	<u>152757</u>
Total Operating Cost			166901	333801	500702
			=====	=====	=====
Operating Cst per Bu.			.0303456	.0303456	.0303456

Table A30: Fixed Costs For A 1,100,000 Bushel Capacity Elevator In 1986

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.6%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Insurance	46468	50996	55382	55382	55382
Bonds	6320	6936	7532	7532	7532
Taxes	11429	12543	13621	13621	13621
Mgr. Salary	51996	57063	61971	61971	61971
Asst. Mgr. Sal	27500	30180	32775	32775	32775
Emp Ben	23451	25736	27950	27950	27950
Payroll Tax	5962	6543	7106	7106	7106
Unemp Comp	353	387	421	421	421
Workmen's Co	1733	1902	2065	2065	2065
Director Fees	1600	1756	1907	1907	1907
Dues	400	439	477	477	477
Annual Meet	1500	1646	1788	1788	1788
Warehouse Lic.	78	86	<u>93</u>	<u>93</u>	<u>93</u>
Tot Nondepreciable FC			213088	213088	213088
			=====	=====	=====
Ndeprec. FC per Bu.			.0387433	.0193716	.0129144
Depreciable			Annual Equiv. Cost (Int. Rt. = 11.06%)		
Item Name	1980 Cst.	'86 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	43898	4855	4855	4855
Elevator Struct.	2365000	2595476	305342	305342	305342
Driveway Struct.	420000	460930	54318	54318	54318
Elevator Mach.	1000000	1097453	192669	192669	192669
Dust Control	175000	192054	33717	33717	33717
Drier System	150000	164618	28900	28900	28900
Electrical	190000	208516	36592	36592	36592
Aeration and Temp	130000	142669	25018	25018	25018
RR Trackage	265180	291023	40845	40845	40845
Railcar Mover	43330	47553	11020	11020	11020
Office Bldg.	105000	115233	13549	13549	13549
Office Furniture	30000	32924	5787	5787	5787
Contingencies	275000	301800	<u>51375</u>	<u>51375</u>	<u>51375</u>
Total Depr. FC Per Yr.			803988	803988	803988
			=====	=====	=====
Total Depr. FC Per Bu.			.1461795	.0730898	.0487265

Table A31: Variable Costs For A 100,000 Bushel Capacity Elevator In 1987

Item Name	1980 Cst.	Due to Grain Handling			
		'87 Cst.	Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	3542	3981	971	1943	2914
Laborers	10677	12001	2928	5857	8785
Emp Ben	3697	4156	1014	2028	3042
Payroll Tax	1066	1198	362	725	1087
Unemp Comp	218	245	74	148	222
Office Supp	1040	1246	282	564	846
Elevator Supp	1497	1683	841	1683	2524
Power	2813	3162	1265	2530	3794
Telephone	1789	2143	1071	2143	3214
Subscriptions	83	99	23	45	68
Advertising	562	673	162	324	486
Special Meet	135	152	23	46	69
Travel & Con	465	523	79	158	237
Legal Fees	183	206	50	100	151
Rodent Cont	130	146	25	50	75
Tax & Div	116	130	32	64	95
Data Process	172	193	46	93	139
Grain Test/Weigh	8319	9351	4675	9351	14026
Workmen's Co	1073	1206	<u>365</u>	<u>730</u>	<u>1095</u>
Total Variable Costs			14290	28580	42870
Int. on Var. Cost (6Mo, 8.65%)			618	1236	1854
Interest on Gr Ha (15 days, 8.65%)			<u>4646</u>	<u>9293</u>	<u>13939</u>
Total Operating Cost			19554	39109	58663
			=====	=====	=====
Operating Cst per Bu.			.0391090	.0391090	.0391090

Table A32: Fixed Costs For A 100,000 Bushel Capacity Elevator In 1987

Item Name	1980 Cst.	'87 Cst.	Annual Equiv. Cost (Int. Rt. = 8.65%)		
			Turn.5	Turn.10	Turn.15
Insurance	7846	8819	9582	9582	9582
Bonds	1010	1135	1233	1233	1233
Taxes	2056	2311	2511	2511	2511
Mgr. Salary	18022	20257	22010	22010	22010
Asst. Mgr. Sal	8366	9404	10217	10217	10217
Emp Ben	7764	8727	9482	9482	9482
Payroll Tax	1975	2220	2412	2412	2412
Unemp Comp	353	397	431	431	431
Workmen's Comp	1733	1948	2116	2116	2116
Director Fees	371	417	453	453	453
Dues	115	129	140	140	140
Annual Meet	361	406	441	441	441
Warehouse Lic.	13	15	<u>16</u>	<u>16</u>	<u>16</u>
Tot Nondepreciable FC			61045	61045	61045
			=====	=====	=====
Ndeprec. FC per Bu.			.1220893	.0610447	.0406964

Table A33: Variable Costs For A 300,000 Bushel Capacity Elevator In 1987

Item Name	1980 Cst.	'87 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	8744	9829	2398	4796	7194
Laborers	29120	32732	7987	15973	23960
Emp Ben	9845	11066	2700	5400	8100
Payroll Tax	2840	3192	966	1931	2897
Unemp Comp	529	595	180	360	540
Office Supp	2750	3294	746	1492	2238
Elevator Supp	3500	3934	1967	3934	5901
Power	7500	8430	3372	6744	10116
Telephone	4645	5563	2782	5563	8345
Subscriptions	300	359	81	163	244
Advertising	1750	2096	504	1008	1512
Special Meet	350	393	59	119	178
Travel & Con	1354	1522	230	460	689
Legal Fees	500	562	137	274	411
Rodent Cont	350	393	68	135	203
Tax & Div	325	365	89	178	267
Data Process	500	562	135	270	405
Grain Test/Weigh	25208	28335	14167	28335	42502
Workmen's Co	2600	2922	<u>884</u>	<u>1768</u>	<u>2652</u>
Total Variable Costs			39452	78905	118357
Int. on Var. Cost (6Mo, 8.65%)			1706	3413	5119
Interest on Gr Ha (15 days, 8.65%)			<u>13939</u>	<u>27879</u>	<u>41818</u>
Total Operating Cost			55098	110196	165294
			=====	=====	=====
Operating Cst per Bu.			.0367320	.0367320	.0367320

Table A34: Fixed Costs For a 300,000 Bushel Capacity Elevator In 1987

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.65%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Insurance	19258	21647	23519	23519	23519
Bonds	3060	3440	3737	3737	3737
Taxes	5091	5722	6217	6217	6217
Mgr. Salary	35747	40181	43656	43656	43656
Asst. Mgr. Sal	18500	20795	22593	22593	22593
Emp Ben	16003	17988	19544	19544	19544
Payroll Tax	4069	4574	4969	4969	4969
Unemp Comp	353	397	431	431	431
Workmen's Co	1733	1948	2116	2116	2116
Director Fees	900	1012	1099	1099	1099
Dues	250	281	305	305	305
Annual Meet	850	955	1038	1038	1038
Warehouse Lic.	39	44	48	48	48
Tot Nondepreciable FC			129274	129274	129274
			=====	=====	=====
Ndeprec. FC per Bu.			.0861827	.0430913	.0287276
Depreciable			Annual Equiv. Cost (Int. Rt. = 10.175%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Land	10000	11240	1144	1144	1144
Elevator Struct.	735000	826163	90176	90176	90176
Driveway Struct.	420000	472093	51529	51529	51529
Elevator Mach.	450000	505814	85663	85663	85663
Dust Control	90000	101163	17145	17145	17145
Drier System	120000	134884	22860	22860	22860
Electrical	120000	134884	22860	22860	22860
Aeration and Temp	40000	44961	7620	7620	7620
RR Trackage	132590	149035	19646	19646	19646
Railcar Mover	43330	48704	10958	10958	10958
Office Bldg.	60000	67442	7367	7367	7367
Office Furniture	20000	22481	3810	3810	3810
Contingencies	150000	168605	27646	27646	27646
Total Depr. FC Per Yr.			368425	368425	368425
			=====	=====	=====
Total Depr. FC Per Bu.			.2456168	.1228084	.0818723

Table A35: Variable Costs For A 500,000 Bushel Capacity Elevator In 1987

Item Name	1980 Cst.	'87 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	11872	13344	3256	6512	9768
Laborers	43680	49098	11980	23960	35939
Emp Ben	14444	16236	3961	7923	11884
Payroll Tax	4166	4683	1417	2833	4250
Unemp Comp	706	794	240	480	720
Office Supp	4000	4791	1085	2170	3255
Elevator Supp	4500	5058	2529	5058	7587
Power	11000	12364	4946	9891	14837
Telephone	6635	7947	3973	7947	11920
Subscriptions	600	719	163	326	488
Advertising	3000	3593	864	1728	2592
Special Meet	500	562	85	170	255
Travel & Con	2167	2436	368	736	1103
Legal Fees	750	843	206	411	617
Rodent Cont	520	584	101	201	302
Tax & Div	500	562	137	274	411
Data Process	800	899	216	433	649
Grain Test/Weigh	42013	47224	23612	47224	70836
Workman's Co	3466	3896	<u>1179</u>	<u>2357</u>	<u>3536</u>
Total Variable Costs			60317	120634	180951
Int. on Var. Cost (6Mo, 8.65%)			2609	5217	7826
Interest on Gr Ha (15 days, 8.65%)			<u>23232</u>	<u>46464</u>	<u>69696</u>
Total Operating Cost			86158	172316	258474
			=====	=====	=====
Operating Cst per Bu.			.0344631	.0344631	.0344631

Table A36: Fixed Costs For A 500,000 Bushel Capacity Elevator In 1987

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.65%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Insurance	25998	29223	31750	31750	31750
Bonds	5100	5733	6228	6228	6228
Taxes	6933	7793	8467	8467	8467
Mgr. Salary	38997	43834	47625	47625	47625
Asst. Mgr. Sal	22500	25291	27478	27478	27478
Emp Ben	18142	20392	22156	22156	22156
Payroll Tax	4612	5184	5632	5632	5632
Unemp Comp	353	397	431	431	431
Workmen's Co	1733	1948	2116	2116	2116
Director Fees	1200	1349	1466	1466	1466
Dues	300	337	366	366	366
Annual Meet	1100	1236	1343	1343	1343
Warehouse Lic.	65	73	<u>79</u>	<u>79</u>	<u>79</u>
Tot Nondepreciable FC			155140	155140	155140
			=====	=====	=====
Ndeprec. FC per Bu.			.0620561	.0310281	.0206854

Depreciable			Annual Equiv. Cost (Int. Rt. = 10.175%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Land	20000	22481	2287	2287	2287
Elevator Struct.	1175000	1320736	144165	144165	144165
Driveway Struct.	420000	472093	51529	51529	51529
Elevator Mach.	550000	618217	104589	104589	104589
Dust Control	125000	140504	23782	23782	23782
Drier System	120000	134884	22860	22860	22860
Electrical	150000	168605	28513	28513	28513
Aeration and Temp	50000	56202	9525	9525	9525
RR Trackage	265180	298071	39268	39268	39268
Railcar Mover	43330	48704	10958	10958	10958
Office Bldg.	60000	67442	7379	7379	7379
Office Furniture	20000	22481	3810	3810	3810
Contingencies	200000	224806	<u>36862</u>	<u>36862</u>	<u>36862</u>
Total Depr. FC Per Yr.			485528	485528	485528
			=====	=====	=====
Total Depr. FC Per Bu.			.1942113	.0971056	.0647371

Table A37: Variable Costs For A 850,000 Bushel Capacity Elevator In 1987

Item Name	1980 Cst.	'87 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	14677	16497	4025	8051	12076
Laborers	58240	65464	15973	31946	47919
Emp Ben	18958	21309	5199	10399	15598
Payroll Tax	5469	6147	1860	3719	5579
Unemp Comp	882	991	300	600	900
Office Supp	5250	6288	1424	2848	4273
Elevator Supp	6000	6744	3372	6744	10116
Power	15000	16860	6744	13488	20233
Telephone	8626	10332	5166	10332	15497
Subscriptions	850	1018	231	461	692
Advertising	3500	4192	1008	2016	3025
Special Meet	750	843	127	255	382
Travel & Con	2709	3045	460	920	1379
Legal Fees	1000	1124	274	549	823
Rodent Cont	700	787	135	271	406
Tax & Div	750	843	206	411	617
Data Process	1250	1405	338	676	1014
Grain Test/Weigh	71429	80288	40144	80288	120433
Workmen's Co	4333	4870	<u>1473</u>	<u>2947</u>	<u>4420</u>
Total Variable Costs			88460	176921	265381
Int. on Var. Cost (6Mo, 8.65%)			3826	7652	11478
Interest on Gr Ha (15 days, 8.65%)			<u>39495</u>	<u>78989</u>	<u>118484</u>
Total Operating Cost			131781	263562	395343
			=====	=====	=====
Operating Cst per Bu.			.0310073	.0310073	.0310073

Table A38: Fixed Costs For A 850,000 Bushel Capacity Elevator In 1987

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.65%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Insurance	38049	42768	46468	46468	46468
Bonds	5810	6531	7096	7096	7096
Taxes	9672	10872	11812	11812	11812
Mgr. Salary	45497	51140	55564	55564	55564
Asst. Mgr. Sal	25000	28101	30531	30531	30531
Emp Ben	20797	23376	25399	25399	25399
Payroll Tax	5287	5943	6457	6457	6457
Unemp Comp	353	397	431	431	431
Workmen's Co	1733	1948	2116	2116	2116
Director Fees	1600	1798	1954	1954	1954
Dues	400	450	489	489	489
Annual Meet	1500	1686	1832	1832	1832
Warehouse Lic.	78	88	95	95	95
Tot Nondepreciable FC			190243	190243	190243
			=====	=====	=====
Ndeprec. FC per Bu.			.0447630	.0223815	.0149210
Depreciable			Annual Equiv. Cost (Int. Rt. = 10.175%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	44961	4575	4575	4575
Elevator Struct.	1912000	2149147	234699	234699	234699
Driveway Struct.	420000	472093	51653	51653	51653
Elevator Mach.	750000	843023	142690	142690	142690
Dust Control	150000	168605	28538	28538	28538
Drier System	150000	168605	28538	28538	28538
Electrical	180000	202326	34228	34228	34228
Aeration and Temp	100000	112403	19025	19025	19025
RR Trackage	265180	298071	39268	39268	39268
Railcar Mover	43330	48704	10958	10958	10958
Office Bldg.	105000	118023	12882	12882	12882
Office Furniture	30000	33721	5715	5715	5715
Contingencies	250000	281008	46077	46077	46077
Total Depr. FC Per Yr.			658846	658846	658846
			=====	=====	=====
Total Depr. FC Per Bu.			.1550227	.0775113	.0516742

Table A39: Variable Costs For A 1,100,000 Bushel Capacity Elevator In 1987

Item Name	1980 Cst.	'87 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	17488	19657	4796	9593	14389
Laborers	76960	86505	21107	42215	63322
Emp Ben	24556	27602	6735	13470	20204
Payroll Tax	7084	7963	2409	4817	7226
Unemp Comp	1058	1189	360	719	1079
Office Supp	6500	7785	1763	3527	5290
Elevator Supp	7500	8430	4215	8430	12645
Power	18000	20233	8093	16186	24279
Telephone	11943	14304	7152	14304	21457
Subscriptions	1000	1198	271	543	814
Advertising	4000	4791	1152	2304	3457
Special Meet	1000	1124	170	339	509
Travel & Con	3521	3958	598	1195	1793
Legal Fees	1300	1461	357	713	1070
Rodent Cont	850	955	164	329	493
Tax & Div	1000	1124	274	549	823
Data Process	1750	1967	473	946	1419
Grain Test/Weigh	92438	103903	51952	103903	155855
Workmen's Co	5200	5845	<u>1768</u>	<u>3536</u>	<u>5304</u>
Total Variable Costs			113809	227619	341428
Int. on Var. Cost (6Mo, 8.65%)			4922	9845	14767
Interest on Gr Ha (15 days, 8.65%)			<u>51111</u>	<u>102221</u>	<u>153332</u>
Total Operating Cost			169842	339685	509527
			=====	=====	=====
Operating Cst per Bu.			.0308804	.0308804	.0308804

Table A40: Fixed Costs For A 1,100,000 Bushel Capacity Elevator In 1987

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 8.65%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Insurance	46468	52231	56749	56749	56749
Bonds	6320	7104	7718	7718	7718
Taxes	11429	12847	13958	13958	13958
Mgr. Salary	51996	58445	63501	63501	63501
Asst. Mgr. Sal	27500	30911	33585	33585	33585
Emp Ben	23451	26360	28640	28640	28640
Payroll Tax	5962	6701	7281	7281	7281
Unemp Comp	353	397	431	431	431
Workmen's Comp	1733	1948	2116	2116	2116
Director Fees	1600	1798	1954	1954	1954
Dues	400	450	489	489	489
Annual Meet	1500	1686	1832	1832	1832
Warehouse Lic.	78	88	95	95	95
Tot Nondepreciable FC			218349	218349	218349
			=====	=====	=====
Ndeprec. FC per Bu.			.0396998	.0198499	.0132333
Depreciable			Annual Equiv. Cost (Int. Rt. = 10.175%)		
Item Name	1980 Cst.	'87 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	44961	4575	4575	4575
Elevator Struct.	2365000	2658333	290330	290330	290330
Driveway Struct.	420000	472093	51653	51653	51653
Elevator Mach.	1000000	1124031	190253	190253	190253
Dust Control	175000	196705	33294	33294	33294
Drier System	150000	168605	28538	28538	28538
Electrical	190000	213566	36133	36133	36133
Aeration and Temp	130000	146124	24703	24703	24703
RR Trackage	265180	298071	39268	39268	39268
Railcar Mover	43330	48704	10958	10958	10958
Office Bldg.	105000	118023	12882	12882	12882
Office Furniture	30000	33721	5715	5715	5715
Contingencies	275000	309109	50685	50685	50685
Total Depr. FC Per Yr.			778988	778988	778988
			=====	=====	=====
Total Depr. FC Per Bu.			.1416341	.0708171	.0472114

Table A41: Variable Costs For A 100,000 Bushel Capacity Elevator In 1988

Item Name	1980 Cst.	'88 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	3542	4087	997	1995	2992
Laborers	10677	12321	3006	6012	9019
Emp Ben	3697	4266	1041	2082	3123
Payroll Tax	1066	1230	372	744	1116
Unemp Comp	218	252	76	152	228
Office Supp	1040	1254	284	568	852
Elevator Supp	1497	1727	864	1727	2591
Power	2813	3246	1298	2597	3895
Telephone	1789	2157	1078	2157	3235
Subscriptions	83	100	23	45	68
Advertising	562	678	163	326	489
Special Meet	135	156	24	47	71
Travel & Con	465	537	81	162	243
Legal Fees	183	211	52	103	155
Rodent Cont	130	150	26	52	77
Tax & Div	116	134	33	65	98
Data Process	172	198	48	95	143
Grain Test/Weigh	8319	9600	4800	9600	14399
Workmen's Co	1073	1238	<u>375</u>	<u>749</u>	<u>1124</u>
Total Variable Costs			14639	29279	43918
Int. on Var. Cost (6Mo, 9.5%)			695	1391	2086
Interest on Gr Ha (15 days, 9.5%)			<u>6852</u>	<u>13705</u>	<u>20557</u>
Total Operating Cost			22187	44374	66562
			=====	=====	=====
Operating Cst per Bu.			.0443743	.0443743	.0443743

Table A42: Fixed Costs For A 100,000 Bushel Capacity Elevator in 1988

Nondepreciable Item Name	1980 Cst.	'88 Cst.	Annual Equiv. Cost (Int. Rt. = 9.5%)		
			Turn.5	Turn.10	Turn.15
Insurance	7846	9054	9914	9914	9914
Bonds	1010	1165	1276	1276	1276
Taxes	2056	2372	2598	2598	2598
Mgr. Salary	18022	20796	22772	22772	22772
Asst. Mgr. Sal	8366	9654	10571	10571	10571
Emp Ben	7764	8959	9810	9810	9810
Payroll Tax	1975	2279	2496	2496	2496
Unemp Comp	353	407	446	446	446
Workmen's Co	1733	2000	2190	2190	2190
Director Fees	371	428	469	469	469
Dues	115	133	145	145	145
Annual Meet	361	417	456	456	456
Warehouse Lic.	13	15	<u>16</u>	<u>16</u>	<u>16</u>
Tot Nondepreciable FC			63159	63159	63159
			=====	=====	=====
Ndeprec. FC per Bu.			.1263176	.0631588	.0421059

Table A43: Variable Costs For A 300,000 Bushel Capacity Elevator In 1988

Item Name	1980 Cst.	'88 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	8744	10090	2462	4924	7386
Laborers	29120	33602	8199	16398	24597
Emp Ben	9845	11360	2772	5544	8316
Payroll Tax	2840	3277	991	1983	2974
Unemp Comp	529	610	185	369	554
Office Supp	2750	3316	751	1502	2253
Elevator Supp	3500	4039	2019	4039	6058
Power	7500	8654	3462	6924	10385
Telephone	4645	5600	2800	5600	8401
Subscriptions	300	362	82	164	246
Advertising	1750	2110	507	1015	1522
Special Meet	350	404	61	122	183
Travel & Con	1354	1562	236	472	708
Legal Fees	500	577	141	282	422
Rodent Cont	350	404	69	139	208
Tax & Div	325	375	92	183	275
Data Process	500	577	139	278	416
Grain Test/Weigh	25208	29088	14544	29088	43632
Workmen's Co	2600	3000	<u>908</u>	<u>1815</u>	<u>2723</u>
Total Variable Costs			40420	80839	121259
Int. on Var. Cost (6Mo, 9.5%)			1920	3840	5760
Interest on Gr Ha (15 days, 9.5%)			<u>20557</u>	<u>41114</u>	<u>61671</u>
Total Operating Cost			62897	125793	188690
			=====	=====	=====
Operating Cst per Bu.			.0419310	.0419310	.0419310

Table A44: Fixed Costs For A 300,000 Bushel Capacity Elevator In 1988

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 9.5%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Insurance	19258	22222	24334	24334	24334
Bonds	3060	3531	3866	3866	3866
Taxes	5091	5875	6433	6433	6433
Mgr. Salary	35747	41250	45168	45168	45168
Asst. Mgr. Sal	18500	21348	23376	23376	23376
Emp Ben	16003	18466	20221	20221	20221
Payroll Tax	4069	4695	5141	5141	5141
Unemp Comp	353	407	446	446	446
Workmen's Comp	1733	2000	2190	2190	2190
Director Fees	900	1039	1137	1137	1137
Dues	250	288	316	316	316
Annual Meet	850	981	1074	1074	1074
Warehouse Lic.	39	45	49	49	49
Tot Nondepreciable FC			133751	133751	133751
			=====	=====	=====
Ndeprec. FC per Bu.			.0891674	.0445837	.0297225
Depreciable			Annual Equiv. Cost (Int. Rt. = 10.36%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Land	10000	11539	1195	1195	1195
Elevator Struct.	735000	848140	94062	94062	94062
Driveway Struct.	420000	484651	53750	53750	53750
Elevator Mach.	450000	519269	88622	88622	88622
Dust Control	90000	103854	17737	17737	17737
Drier System	120000	138472	23649	23649	23649
Electrical	120000	138472	23649	23649	23649
Aeration and Temp	40000	46157	7883	7883	7883
RR Trackage	132590	153000	20443	20443	20443
Railcar Mover	43330	50000	11320	11320	11320
Office Bldg.	60000	69236	7684	7684	7684
Office Furniture	20000	23079	3942	3942	3942
Contingencies	150000	173090	28607	28607	28607
Total Depr. FC Per Yr.			382542	382542	382542
			=====	=====	=====
Total Depr. FC Per Bu.			.2550283	.1275141	.0850094

Table A45: Variable Costs For A 500,000 Bushel Capacity Elevator In 1988

Item Name	1980 Cst.	'88 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	11872	13700	3343	6686	10028
Laborers	43680	50404	12299	24597	36896
Emp Ben	14444	16667	4067	8134	12201
Payroll Tax	4166	4807	1454	2908	4363
Unemp Comp	706	815	246	493	739
Office Supp	4000	4823	1092	2185	3277
Elevator Supp	4500	5193	2596	5193	7789
Power	11000	12693	5077	10155	15232
Telephone	6635	8000	4000	8000	12000
Subscriptions	600	723	164	328	492
Advertising	3000	3617	870	1740	2610
Special Meet	500	577	87	174	261
Travel & Con	2167	2500	378	755	1133
Legal Fees	750	865	211	422	634
Rodent Cont	520	600	103	206	310
Tax & Div	500	577	141	282	422
Data Process	800	923	222	444	666
Grain Test/Weigh	42013	48480	24240	48480	72720
Workmen's Co	3466	4000	<u>1210</u>	<u>2420</u>	<u>3630</u>
Total Variable Costs			61800	123601	185401
Int. on Var. Cost (6Mo, 9.5%)			2936	5871	8807
Interest on Gr Ha (15 days, 9.5%)			<u>34262</u>	<u>68524</u>	<u>102785</u>
Total Operating Cost			98998	197995	296993
			=====	=====	=====
Operating Cst per Bu.			.0395990	.0395990	.0395990

Table A46: Fixed Costs For A 500,000 Bushel Capacity Elevator in 1988

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 9.5%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Insurance	25998	30000	32850	32850	32850
Bonds	5100	5885	6444	6444	6444
Taxes	6933	8000	8760	8760	8760
Mgr. Salary	38997	45000	49275	49275	49275
Asst. Mgr. Sal	22500	25963	28430	28430	28430
Emp Ben	18142	20935	22923	22923	22923
Payroll Tax	4612	5322	5828	5828	5828
Unemp Comp	353	407	446	446	446
Workmen's Co	1733	2000	2190	2190	2190
Director Fees	1200	1385	1516	1516	1516
Dues	300	346	379	379	379
Annual Meet	1100	1269	1390	1390	1390
Warehouse Lic.	65	75	82	82	82
Tot Nondepreciable FC			160513	160513	160513
			=====	=====	=====
Ndeprec. FC per Bu.			.0642054	.0321027	.0214018
Depreciable			Annual Equiv. Cost (Int. Rt = 10.36%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Land	20000	23079	2391	2391	2391
Elevator Struct.	1175000	1355869	150377	150377	150377
Driveway Struct.	420000	484651	53750	53750	53750
Elevator Mach.	550000	634662	108202	108202	108202
Dust Control	125000	144241	24603	24603	24603
Drier System	120000	138472	23649	23649	23649
Electrical	150000	173090	29498	29498	29498
Aeration and Temp	50000	57697	9854	9854	9854
RR Trackage	265180	306000	40861	40861	40861
Railcar Mover	43330	50000	11320	11320	11320
Office Bldg.	60000	69236	7697	7697	7697
Office Furniture	20000	23079	3942	3942	3942
Contingencies	200000	230786	38142	38142	38142
Total Depr. FC Per Yr.			504285	504285	504285
			=====	=====	=====
Total Depr. FC Per Bu.			.2017139	.1008570	.0672380

Table A47: Variable Costs For A 850,000 Bushel Capacity Elevator In 1988

Item Name	1980 Cst.	'88 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	14677	16936	4132	8265	12397
Laborers	58240	67205	16398	32796	49194
Emp Ben	18958	21876	5338	10676	16013
Payroll Tax	5469	6311	1909	3818	5727
Unemp Comp	882	1018	308	616	924
Office Supp	5250	6330	1434	2867	4301
Elevator Supp	6000	6924	3462	6924	10385
Power	15000	17309	6924	13847	20771
Telephone	8626	10400	5200	10400	15600
Subscriptions	850	1025	232	464	696
Advertising	3500	4220	1015	2030	3045
Special Meet	750	865	131	261	392
Travel & Con	2709	3126	472	944	1416
Legal Fees	1000	1154	282	563	845
Rodent Cont	700	808	139	278	417
Tax & Div	750	865	211	422	634
Data Process	1250	1442	347	694	1041
Grain Test/Weigh	71429	82424	41212	82424	123636
Workmen's Co	4333	5000	<u>1513</u>	<u>3025</u>	<u>4538</u>
Total Variable Costs			90657	181314	271971
Int. on Var. Cost (6Mo, 9.5%)			4306	8612	12919
Interest on Gr Ha (15 days, 9.5%)			<u>58245</u>	<u>116490</u>	<u>174735</u>
Total Operating Cost			153208	306417	459625
			=====	=====	=====
Operating Cst per Bu.			.0360490	.0360490	.0360490

Table A48: Fixed Costs For A 850,000 Bushel Capacity Elevator in 1988

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 9.5%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Insurance	38049	43906	48077	48077	48077
Bonds	5810	6704	7341	7341	7341
Taxes	9672	11161	12221	12221	12221
Mgr. Salary	45497	52500	57488	57488	57488
Asst. Mgr. Sal	25000	28848	31589	31589	31589
Emp Ben	20797	23998	26278	26278	26278
Payroll Tax	5287	6101	6680	6680	6680
Unemp Comp	353	407	446	446	446
Workmen's Comp	1733	2000	2190	2190	2190
Director Fees	1600	1846	2022	2022	2022
Dues	400	462	505	505	505
Annual Meet	1500	1731	1895	1895	1895
Warehouse Lic.	78	90	99	99	99
Tot Nondepreciable FC			196832	196832	196832
			=====	=====	=====
Ndeprec. FC per Bu.			.0463133	.0231566	.0154378
Depreciable			Annual Equiv. Cost (Int. Rt. = 10.36%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	46157	4782	4782	4782
Elevator Struct.	1912000	2206317	244810	244810	244810
Driveway Struct.	420000	484651	53877	53877	53877
Elevator Mach.	750000	865449	147618	147618	147618
Dust Control	150000	173090	29524	29524	29524
Drier System	150000	173090	29524	29524	29524
Electrical	180000	207708	35410	35410	35410
Aeration and Temp	100000	115393	19682	19682	19682
RR Trackage	265180	306000	40861	40861	40861
Railcar Mover	43330	50000	11320	11320	11320
Office Bldg.	105000	121163	13437	13437	13437
Office Furniture	30000	34618	5912	5912	5912
Contingencies	250000	288483	47678	47678	47678
Total Depr. FC Per Yr.			684434	684434	684434
			=====	=====	=====
Total Depr. FC Per Bu.			.1610433	.0805217	.0536811

Table A49 : Variable Costs For A 1,100,000 Bushel Capacity Elevator In 1988

Item Name	1980 Cst.	'88 Cst.	Due to Grain Handling		
			Turn.5	Turn.10	Turn.15
Bookkeeper/Secreta	17488	20180	4924	9848	14772
Laborers	76960	88807	21669	43338	65006
Emp Ben	24556	28336	6914	13828	20742
Payroll Tax	7084	8174	2473	4946	7418
Unemp Comp	1058	1221	369	739	1108
Office Supp	6500	7837	1775	3550	5325
Elevator Supp	7500	8654	4327	8654	12982
Power	18000	20771	8308	16617	24925
Telephone	11943	14399	7200	14399	21599
Subscriptions	1000	1206	273	546	819
Advertising	4000	4823	1160	2320	3480
Special Meet	1000	1154	174	348	523
Travel & Con	3521	4063	614	1227	1841
Legal Fees	1300	1500	366	732	1098
Rodent Cont	850	981	169	337	506
Tax & Div	1000	1154	282	563	845
Data Process	1750	2019	486	971	1457
Grain Test/Weigh	92438	106667	53334	106667	160001
Workmen's Co	5200	6000	<u>1815</u>	<u>3630</u>	<u>5445</u>
Total Variable Costs			116630	233261	349891
Int. on Var. Cost (6Mo, 9.5%)			5540	11080	16620
Interest on Gr Ha (15 days, 9.5%)			<u>75376</u>	<u>150752</u>	<u>226128</u>
Total Operating Cost			197546	395092	592638
			=====	=====	=====
Operating Cst per Bu.			.0359175	.0359175	.0359175

Table A50: Fixed Costs For A 1,100,000 Bushel Capacity Elevator in 1988

Nondepreciable			Annual Equiv. Cost (Int. Rt. = 9.5%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Insurance	46468	53621	58715	58715	58715
Bonds	6320	7293	7986	7986	7986
Taxes	11429	13188	14441	14441	14441
Mgr. Salary	51996	60000	65700	65700	65700
Asst. Mgr. Sal	27500	31733	34748	34748	34748
Emp Ben	23451	27061	29632	29632	29632
Payroll Tax	5962	6880	7533	7533	7533
Unemp Comp	353	407	446	446	446
Workmen's Co	1733	2000	2190	2190	2190
Director Fees	1600	1846	2022	2022	2022
Dues	400	462	505	505	505
Annual Meet	1500	1731	1895	1895	1895
Warehouse Lic.	78	90	99	99	99
Tot Nondepreciable FC			225911	225911	225911
			=====	=====	=====
Ndeprec. FC per Bu.			.0410747	.0205374	.0136916
Depreciable			Annual Equiv. Cost (Int. Rt. = 10.36%)		
Item Name	1980 Cst.	'88 Cst.	Turn.5	Turn.10	Turn.15
Land	40000	46157	4782	4782	4782
Elevator Struct.	2365000	2729048	302837	302837	302837
Driveway Struct.	420000	484651	53877	53877	53877
Elevator Mach.	1000000	1153931	196824	196824	196824
Dust Control	175000	201938	34444	34444	34444
Drier System	150000	173090	29524	29524	29524
Electrical	190000	219247	37381	37381	37381
Aeration and Temp	130000	150011	25557	25557	25557
RR Trackage	265180	306000	40861	40861	40861
Railcar Mover	43330	50000	11320	11320	11320
Office Bldg.	105000	121163	13437	13437	13437
Office Furniture	30000	34618	5912	5912	5912
Contingencies	275000	317331	52446	52446	52446
Total Depr. FC Per Yr.			809201	809201	809201
			=====	=====	=====
Total Depr. FC Per Bu.			.1471274	.0735637	.0490425

Appendix B

Table B1

Estimated Margins For North Dakota, South Dakota, and Minnesota in 1984		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.192	.046
300,000	.197	.044
500,000	.158	.042
850,000	.115	.038
1,100,000	.154	.038

Estimated Margins For Washington and Idaho in 1984		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.182	.046
300,000	.187	.044
500,000	.150	.042
850,000	.110	.038
1,100,000	.146	.038

Estimated Margins For Montana, Wyoming, and Colorado in 1984		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.187	.046
300,000	.192	.044
500,000	.154	.042
850,000	.113	.038
1,100,000	.149	.038

Table B2

Estimated Margins For North Dakota, South Dakota, and Minnesota in 1985		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.185	.044
300,000	.189	.042
500,000	.150	.039
850,000	.110	.036
1,100,000	.146	.036

Estimated Margins For Washington and Idaho in 1985		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.175	.044
300,000	.180	.042
500,000	.142	.039
850,000	.105	.036
1,100,000	.139	.036

Estimated Margins For Montana, Wyoming, and Colorado in 1985		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.180	.044
300,000	.185	.042
500,000	.147	.039
850,000	.107	.036
1,100,000	.143	.036

Table B3

Estimated Margins For North Dakota, South Dakota, and Minnesota in 1986		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.166	.038
300,000	.171	.036
500,000	.133	.034
850,000	.097	.031
1,100,000	.130	.030

Estimated Margins For Washington and Idaho in 1986		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.158	.038
300,000	.162	.036
500,000	.127	.034
850,000	.093	.031
1,100,000	.123	.030

Estimated Margins For Montana, Wyoming, and Colorado in 1986		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.162	.038
300,000	.168	.036
500,000	.130	.034
850,000	.095	.031
1,100,000	.126	.030

Table B4

Estimated Margins For North Dakota, South Dakota, and Minnesota in 1987		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.171	.039
300,000	.175	.037
500,000	.138	.035
850,000	.100	.031
1,100,000	.133	.031

Estimated Margins For Washington and Idaho in 1987		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.163	.039
300,000	.166	.037
500,000	.131	.035
850,000	.094	.031
1,100,000	.126	.031

Estimated Margins For Montana, Wyoming, and Colorado in 1987		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.167	.039
300,000	.171	.037
500,000	.135	.035
850,000	.097	.031
1,100,000	.130	.031

Table B5

Estimated Margins For North Dakota, South Dakota, and Minnesota in 1988		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.180	.044
300,000	.186	.042
500,000	.147	.040
850,000	.106	.036
1,100,000	.142	.036

Estimated Margins For Washington and Idaho in 1988		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.171	.044
300,000	.176	.042
500,000	.139	.040
850,000	.102	.036
1,100,000	.135	.036

Estimated Margins For Montana, Wyoming, and Colorado in 1988		
Bushel Capacity	Long Run Margin	Short Run Margin
100,000	.176	.044
300,000	.181	.042
500,000	.143	.040
850,000	.105	.036
1,100,000	.138	.036

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