AN ANALYSIS OF FINANCIAL STATEMENTS OF VIRGINIA'S RETAIL FARM EQUIPMENT BUSINESSES

by

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INTRODUCTION

Relationship of Retail Farm Equipment Businesses to Farming

Within the past fifty years, farm mechanization has become a vital part of our agricultural economy. The application of machinery and equipment on farms has reduced the burden and drudgery of performing farm work. While the use of machinery and equipment has enabled agriculture to expand production, it has correspondingly reduced the cost of production per unit. Farm mechanization has released manpower from farming, which has enabled industry to expand. This has contributed to a higher standard of living.

With the advent of specialization, there has developed more interdependence between the various segments of the agricultural industry and between the various parts of our economy. The final cost of a commodity is made up of costs from all sectors. In general, increased efficiency in any sector of an industry will benefit the entire industry.

The farm equipment retailer plays an important role in the farm machinery distribution process. As farmers continue to shift from the use of farm-produced power to purchased machinery and equipment, they depend more heavily upon farm equipment firms to supply their machinery and equipment needs. Also, as farming becomes more specialized, farmers become more dependent upon these firms for repair parts and the servicing of farm equipment. Thus, the farm machinery and equipment industry is closely related to the production of the nation's supply of food and fiber.

The Development and Growth of the Farm Machinery and Equipment Industry within the United States since 1880

Although the farm machinery and equipment industry in the United States began to develop at an earlier date, a distinct type of marketing process did not evolve and become recognizable until around 1880. The settlement of the West and the development of a network of towns provided the location for rural retailing of machinery and equipment. In 1877, the establishment of Deere and Mansur works in Moline, Illinois, to produce corn planters provided the basis for the developing branch house system of distribution, which exists today. At this stage of development, the established retailers of machinery and equipment supplemented the products produced by Deere and Mansur with purchases from other manufacturers and began to offer a partial "line" of equipment and machinery to their farmer-customers.

With the establishment of the distribution system, manufacturers began to expand. Mergers, acquisitions by purchase, and other forms of consolidation characterized the period from 1900 to 1915. The first large-scale corporation, the International Harvester Company, was organized in 1902 and immediately began to expand its facilities. Deere and Company embarked on a planned growth in the direction of a "full line" firm. Most of the other developing industries were also acquiring specialty manufacturers and expanding beyond a one-product line.

During the period 1915-35, the acceptance of the tractor, and the development and partial acceptance of the principal harvesting machines--

hay baler, corn picker, grain combine, and cotton picker--enabled most retailers to offer a comparatively "full line" of equipment and machinery. The farm equipment industry expanded rapidly during this period.

During the period 1935 to 1953, several events influenced the growth and development of the equipment industry. The end of the Great Depression and war in Europe stimulated the production of our export crops, wheat and cotton. This gave the farmer the incentive to invest in machines, provided they could be obtained from short-in-supply dealers.

In retrospect, it has been postulated that the post-war demand for tractors and major crop production equipment misled many people in the farm equipment industry. Capital and human resources were committed or continued in excess during this period. Since mid-1953, there has been a tendency for the supply of the traditional, established machines to exceed the demand for these machines.

The continuous decline in the number of commercial farmers, the pressure on farm income from surpluses, and changing consumption habits have, to a degree, resulted in a shift in the demand for equipment. The shift has been from a mass market to a more specialized market. Thus, as the farm equipment industry progresses into the future, it will be faced with a mature market, a market in which more change than growth can be anticipated. 1/

1/ George H. Seferovich, "Epochs in Farm Equipment Marketing," Implement and Tractor, February 1, 1961, pp. 34-37.

Changes in Farming and Farm Equipment Businesses

The number of farms in the United States and Virginia has been decreasing, while the average size of farm has been increasing (Table 1). From 1920 to 1954, the number of farms in the United States decreased from 6,448,343 farms to 4,782,416 farms. In Virginia, the number of farms decreased from 186,242 farms in 1920 to 97,623 farms in 1959.

Table 1. Number of Farms and Average Size of Farm, United States and Virginia, 1920-1959

Year	Number of farms		Average size of farm 1/	
	United States	Virginia	United States	Virginia
1920	6,448,343	186,242	148.2	99.7
1925	6,371,640	193,723	145.1	88.8
1930	6,288,648	170,610	156.9	98.1
1935	6,812,350	197,632	154.8	89.3
1940	6,096,799	174,885	174.0	94.0
1945	5,859,169	173,051	194.8	94.5
1950	5,382,162	150,997	215.6	103.1
1954	4,782,416	136,416	242.2	107.7
1959	NA	97,623	NA	134.5

1/ Acres per farm.

Source: Bureau of the Census, U. S. Census of Agriculture, 1954: Volume II, General Report, United States and other comparable volumes; and Bureau of the Census, U. S. Census of Agriculture, 1959: Volume I, Counties, Part 24, Virginia.

As the number of farms has decreased, the average size of farm has increased. Average number of acres per farm in the United States in 1920 was 148.2 acres. By 1954, the average number of acres per farm in the United States was 242.2. In Virginia, average land acreage per farm increased from 99.7 acres in 1920 to 134.5 acres in 1959.

Another significant change in agriculture has been the shift in the source of farm power. The number of horses and mules on farms in the United States and Virginia has decreased, while the number of tractors on farms has increased rapidly (Table 2). From 1920 to 1954, the number of horses and mules on farms in the United States decreased from 25,199,552 to 4,141,288. In Virginia, the number of horses and mules on farms decreased from 409,295 in 1920 to 84,293 in 1959.

Table 2. Number of Horses and Mules and Number of Tractors on Farms, United States and Virginia, 1920-1959

Year	Number of horses and mules		Number of tractors	
	United States	Virginia	United States	Virginia
1920	25,199,552	409,295	246,083	2,379
1925	22,081,520	362,664	505,933	6,750
1930	18,885,856	297,747	920,021	9,757
1935	16,676,010	255,831	NA	NA
1940	13,931,531	253,097	1,567,430	11,951
1945	11,628,794	237,461	2,421,747	23,418
1950	7,603,910	194,832	3,609,281	48,133
1954	4,141,288	121,279	4,692,341	77,567
1959	NA	84,293	NA	92,329

Source: Bureau of the Census, U. S. Census of Agriculture, 1954: Volume II, General Report, United States and other comparable volumes; and Bureau of the Census, U. S. Census of Agriculture, 1959: Volume I, Counties, Part 24, Virginia.

The number of tractors on farms in the United States increased from 246,083 in 1920 to 4,692,341 in 1954. Tractors on farms in Virginia increased from 2,379 in 1920 to 92,329 in 1959.

In recent years, there has been a steady decline in the number of franchised farm equipment businesses in the United States. In 1960,

there were approximately 18,000 fewer farm equipment businesses than in 1940 (Figure 1).

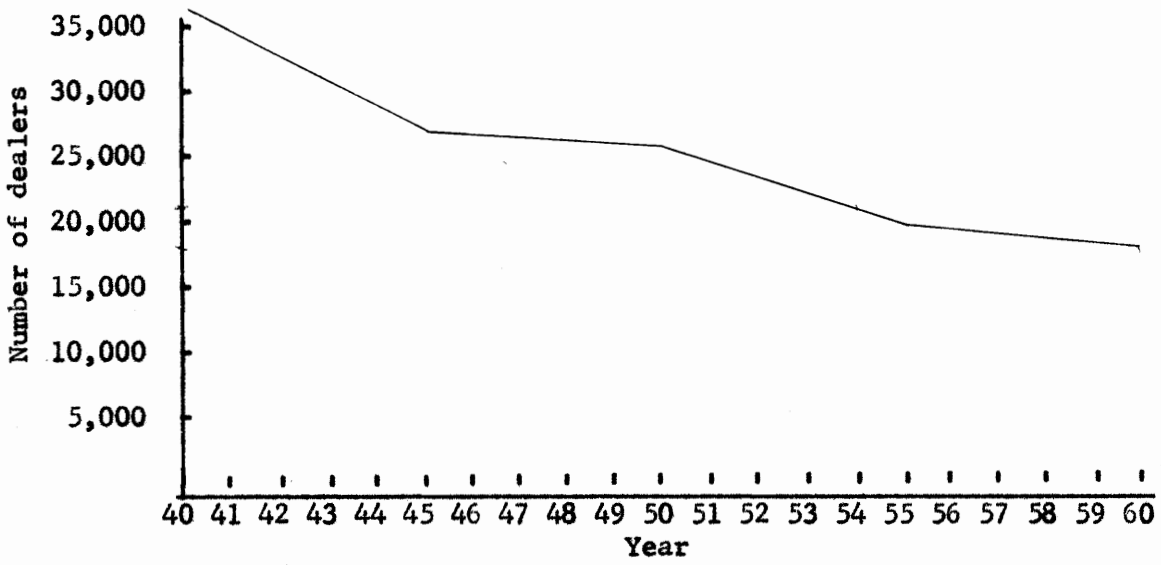

Figure 1. Estimated Number of Franchised Farm Equipment Businesses, United States, 1940-1960

Source: Virginia Farm Equipment Association, Richmond, Virginia.

Nature of Problem

In past years, sales of farm machinery were replacing animal and human labor. As most Virginia farms have become mechanized, the sale of new farm equipment is largely for replacement of present equipment--either for worn-out equipment or for replacing smaller units with larger units. Many firms entered the farm equipment business during a period when there was a rapid build-up in the number of tractors and equipment on farms. During this period it was easy to sell new equipment. Also, there were relatively few items of used equipment traded in on the purchase of new machinery. Today, with the sale of practically every unit of new equipment, the dealer must take in a unit of used

equipment. It is now more difficult than ever before to dispose of the large amount of used equipment at profitable prices.

Furthermore, the decrease in the number of farms and the increase in size of farm brought about a different type of customer for farm equipment. These customers demand larger units of equipment and may purchase complete systems of farm equipment. Generally, this type of individual is a preferred customer. However, when investing large sums of money, this customer will seek the best bargain possible. Competition among farm equipment dealers for the business of these customers has driven margins down. If farm equipment businesses are to survive in the present competitive situation, they will have to make more efficient use of the resources employed.

Other than the Cost of Doing Business survey 1/, farm equipment dealers do not have any standards or guideposts of efficient use of the various resources employed in their businesses. Furthermore, many dealers do not keep detailed accounts to show where their resources are being used. Without a knowledge of the cost and use of the various resources, it is difficult to improve the efficiency of business operations.

Objectives of Study

This project is a pioneer project in Virginia. Long-range plans include several other projects in the farm machinery and equipment field.

1/ National Retail Farm Equipment Association, Cost of Doing Business, Saint Louis, Missouri.

The primary objective of this study is to present an over-all description of the financial structure of Virginia's farm machinery and equipment industry.

Other objectives of this study are as follows:

(1) to determine the resources employed within Virginia farm equipment businesses,

(2) to provide guideposts for individual farm equipment businesses to use in adjusting resources within the firm to increase net returns 1/,

(3) to determine the effects of selected factors on net profits of farm equipment dealers, and

(4) to provide basic information to guide further research in this field.

Review of Literature

Rondo A. Christensen at Cornell University conducted a study with the purpose of making a business management analysis of a representative group of New York farm equipment firms. 2/ Further objectives of the study were (1) to ascertain the costs of operation of these firms,

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1/ Guidepost, as used in this study, is defined as being financial information presented in such manner that it may be used by farm equipment dealers to compare their financial records with those of other businesses. It is recognized that this information has limited use.

2/ Rondo A. Christensen, Factors Affecting Returns in Retail Farm Equipment Businesses, Cornell University Agricultural Experiment Station, Research Bulletin 1087, December, 1957.

(2) to determine those business management factors which contribute most to success, and (3) to provide information to farm equipment dealers which might be useful to them in the study of their own businesses. Data for the 1955 operating year were obtained from the financial records of seventy-three New York retail farm equipment businesses. For purposes of analysis, the firms were divided into three size of business groups, using total net sales as an indicator of size, and into three profitability groups, using labor income as an indicator of profit. The method of analysis used was that of comparative analysis.

The study indicated that size of business, sales diversification, gross margin per dollar of sales, operating efficiency, labor efficiency, and capital efficiency were all related to variations in returns. Statistical techniques were not used to determine which factors were significant. However, it was stated that of the factors studied, size of business was the most important factor affecting returns.

Another significant statement made was that labor income varied from a negative $14,368 to $794 among the twenty-four "low profit" firms, from $895 to $4,161 among the twenty-five "medium profit" firms, and from $4,246 to $33,296 among the twenty-four "high profit" firms. Labor income was computed by taking: (1) total net sales, (2) less cost of goods sold, (3) less operating expenses (not including the operator's salary allowance), and (4) less five percent interest on the average net worth.

William A. Cromarty of Michigan State University conducted a study of the factors affecting the demand for farm machinery and tractors. 1/ This study attempted to determine those factors which have an influence on the total demand for farm machinery in the United States.

The agricultural experiment station at Louisiana State University has recently initiated a research project dealing with business organization of farm equipment businesses. 2/ The objectives of the study are (1) to describe the Louisiana retail farm equipment industry, and (2) to uncover problem areas associated with the farm equipment businesses.

Also, other agricultural experiment stations are conducting research in the field of business agencies serving agriculture. However, none of these are in the field of farm equipment.

Selection of Sample

Information for selecting a sample was obtained by mail questionnaire sent to all franchised farm equipment dealers in Virginia. Approximately 72 percent of the dealers returned the questionnaire. Respondents who were unwilling to provide detailed financial information were eliminated. Firms that had been in operation for less than two fiscal years were eliminated.

1/ William A. Cromarty, The Demand for Farm Machinery and Tractors, Michigan State Agricultural Experiment Station, Technical Bulletin 275, November, 1959.

2/ F. L. Corty, The Farm Equipment Firms of Louisiana, Louisiana State University Agricultural Experiment Station, Unpublished Information, Baton Rouge 3, Louisiana.

The firms were grouped into five sales categories. Fifteen firms were selected at random from each group. Alternate firms, randomly selected, were used when an originally selected firm was unable to provide the desired information.

Many franchised farm machinery and equipment dealers operate other types of businesses in conjunction with farm equipment. Therefore, the definition of a retail farm machinery and equipment business, as used in this study, is an establishment from which at least 75 percent of its sales are derived from the sale of new farm equipment, used farm equipment, parts, and service labor.

Nature and Characteristics of Financial Records

Data used in this study were obtained from the records of sixty-two Virginia farm machinery and equipment dealers located throughout the State (Figure 2). The data were taken from financial statements for the 1960 fiscal year. 1/ When available, a departmental breakdown of gross margins was obtained and an effort was made to obtain expenses and net profits by departments.

Several characteristics of the industry prevented the use of the total number of firms selected in the original sample. Many of the firms visited, particularly those with a small volume of sales, did not keep detailed financial information. Several firms did not have records

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1/ The 1960 fiscal year for most firms ended December 31. A few firms had fiscal years ending on other dates.

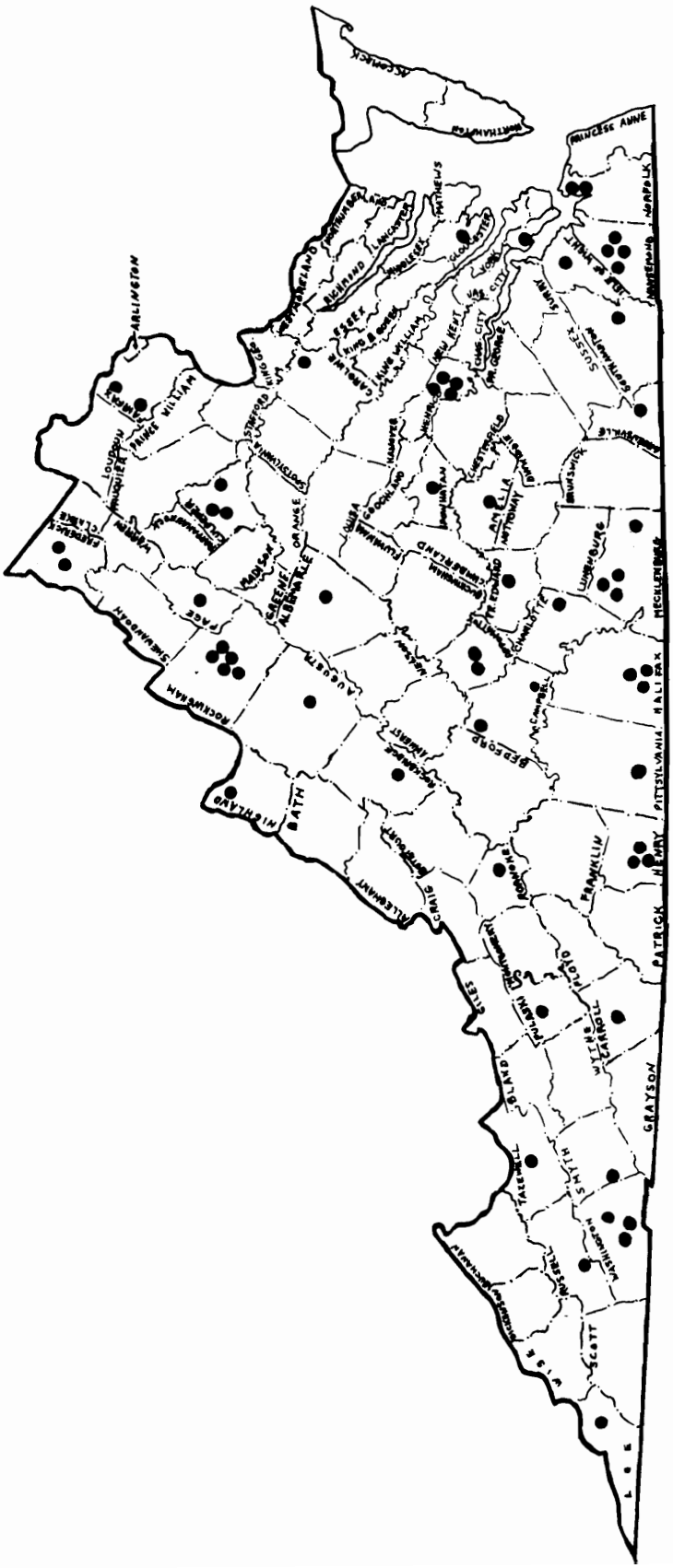

Figure 2. Location of 62 Retail Farm Equipment Businesses Used in This Study, Virginia, 1960

of such things as inventory by department, investment, or a breakdown of costs.

It was necessary to visit 103 firms in order to obtain sixty-two usable records (Table 3). Forty-one of the dealers could not or would not provide the type of information needed. It should be noted that 46.3 percent of these fell within the category with the least amount of sales. Of twenty-seven dealers with sales of less than $100,000, only eight could provide the data requested.

Table 3. Number of Retail Farm Equipment Businesses Visited and Number of Usable Records Obtained, by Sales Groups, Virginia, 1960

Sales group	Firms visited	Usable records	Difference
$100,000 or less	27	8	19
$100,001 - 200,000	22	15	7
$200,001 - 300,000	18	15	3
$300,001 - 400,000	18	15	3
More than $400,000	18	9	9
Total	103	62	41

The reason for most records not being usable was that records were not separated from other businesses (Table 4). Some of the more common businesses operated in conjunction with farm equipment were truck sales, car sales, hardware, feed, seed, and fertilizer. Some of the less common were furniture businesses, egg operations, and vegetable packing. In a few cases, it was possible to separate the records of the farm equipment business from those of the other businesses. Yet, there were twenty-four firms which did not segregate their machinery business from other businesses.

Table 4. Reasons Why Records Were Not Obtained from 41 Retail Farm Equipment Businesses, Virginia, 1960

Sales group	Records not separated	Unsatisfactory records	Records not available	Dealers not cooperative	Total
$100,000 or less	11	3	3	2	19
$100,001 - 200,000	2	2	0	3	7
$200,001 - 300,000	2	0	0	1	3
$300,001 - 400,000	1	2	0	0	3
More than $400,000	8	0	1	0	9
Total	24	7	4	6	41

There were seven businesses which had records that were unsatisfactory for this study. These were either incomplete, or not broken down sufficiently. The records of four dealers were not available for various reasons, and six dealers were not willing to furnish the information needed.

Furthermore, of the sixty-eight records obtained, only thirty-eight businesses had gross margins by departments (Table 5). Only two of the total number of firms visited had allocated operating expenses to each department.

Table 5. Number of Retail Farm Equipment Businesses with Gross Margins by Departments, by Sales Groups, Virginia, 1960

Sales group	No. of firms*	With margins by departments	Without margins by departments
$100,000 or less	8	4	4
$100,001 - 200,000	15	7	8
$200,001 - 300,000	15	9	6
$300,001 - 400,000	16	10	6
More than $400,000	14	8	6
Total	68	38	30

* This includes firms with gross margins by departments but which did not have their financial statements segregated for the various types of businesses.

Method of Analysis

The primary method of analysis used in this study was comparative analysis. The analysis was based on five sales groups.

Among and within analysis of variance was used to test whether significant differences existed among sales groups for selected statement of profit and loss and balance sheet items. Where significant differences did exist, separation of means was employed to determine which of the five arithmetic means were significantly different.

Several sample characteristics were computed for each of the items selected from the statement of profit and loss and the balance sheet. Those characteristics computed and their definitions were as follows:

(1) range - the smallest and largest value occurring within each sales group for each selected item.

(2) arithmetic mean - the sum of all relevant observations divided by the number of such observations.

(3) median - the middle item of a set of observations such that one-half of the values are less and one-half of the values are greater.

(4) standard deviation - the value obtained by taking the square root of the variance. The variance is defined as being the sum of squares of the deviations of the observations from the arithmetic mean, divided by one less than the total number of observations.

(5) coefficient of variation - the standard deviation stated as a percent of the arithmetic mean.

Selected business ratios were computed for each sales group and for all firms.

Each sales group was further divided into two profit groups. The financial statements by profit groups for all firms are presented in the body of the thesis; the profit groups for the individual sales groups can be found in Appendix C.

Also, multiple regression was used to investigate the effects of several independent variables on net profits.

CHARACTERISTICS OF VIRGINIA'S RETAIL FARM EQUIPMENT BUSINESSES 1/

Location of Firms

In 1960 there were 312 franchised farm machinery and equipment dealers in Virginia. These dealers are located throughout the State (Figure 3).

Organization of Businesses

Of the 217 firms providing information on business organization, 112 dealerships were corporations; 57 were partnerships; and 47 were single proprietorships (Table 6). Only one dealership was organized as a cooperative.

Table 6. Distribution of 217 Retail Farm Equipment Businesses, by Type of Business Organization, Virginia, 1961

Type of business organization	Number of firms	Percent
Corporation	112	51.6
Partnership	57	26.3
Single proprietorship	47	21.6
Cooperative	1	0.5
Total	217	100.0

1/ Data presented in this section were taken from mail questionnaires which were returned by 223 Virginia retail farm equipment businesses.

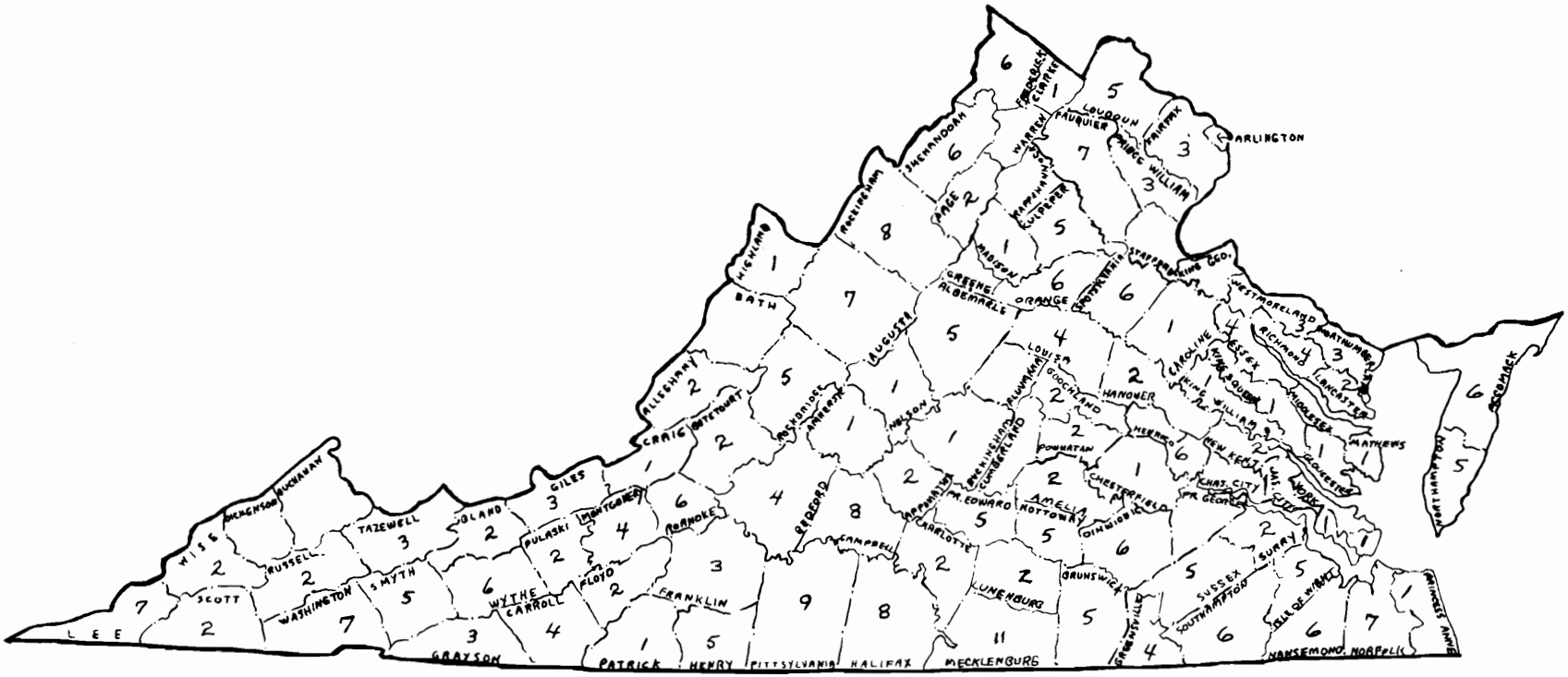

Figure 3. Number of Retail Farm Equipment Businesses, by Counties, Virginia, 1960

Source: Virginia Farm Equipment Association, Richmond, Virginia

Years in Operation

Of the 212 firms reporting, approximately one-third were not in the farm equipment business in 1950 (Table 7). Furthermore, 17 percent were not in business in 1955. Approximately 31 percent of these firms entered the farm equipment business between 1945 and 1950, a period when sales of farm equipment were good. Eight of these firms had been in the farm equipment business for over fifty years.

Table 7. Distribution of 212 Retail Farm Equipment Businesses, by Years in Operation, Virginia, 1961

Years in operation	Number of firms	Percent
Under 5	36	17.0
5 - 10	35	16.5
11 - 15	65	30.6
16 - 20	11	5.2
21 - 25	22	10.4
26 - 50	35	16.5
Over 50	8	3.8
Total	212	100.0

Years Operated under Present Management

As expected, a close relationship existed between number of years in operation and number of years operated under present management. Of these 212 firms, approximately one-fifth had managers with less than five years experience in their present position (Table 8). Approximately 19 percent of the firms had been operating under the present management for more than twenty years.

Table 8. Distribution of 212 Retail Farm Equipment Businesses, by Years Operated under Present Management, Virginia, 1961

Years operated under present management	Number of firms	Percent
Under 5	44	20.7
5 - 10	54	25.5
11 - 15	61	28.8
16 - 20	13	6.1
21 - 25	15	7.1
26 - 50	24	11.3
Over 50	1	0.5
Total	212	100.0

Volume of Sales

The Virginia retail farm equipment industry is characterized by a large number of relatively small businesses. Over two-thirds of the 210 dealers had sales of less than $200,000 annually (Table 9). About eight percent had sales of more than $400,000.

Table 9. Distribution of 210 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1961

Sales group	Number of firms	Percent
$100,000 or less	71	33.8
$100,001 - 200,000	71	33.8
$200,001 - 300,000	31	14.8
$300,001 - 400,000	20	9.5
More than $400,000	17	8.1
Total	210	100.0

Merchandise Handled

It is a common practice in the farm equipment industry for retail dealers to handle merchandise other than the traditional farm machinery and equipment items.

Allied Lines

A large proportion of Virginia dealers handled garden and lawn equipment, dairy equipment, and orchard equipment (Table 10). A smaller number carried chain saws, farm pumps and irrigating systems.

Table 10. Number of Retail Farm Equipment Businesses Handling Various Allied Lines, Virginia, 1961

Allied lines	Number of firms
Garden and lawn equipment	71
Dairy equipment	42
Orchard equipment	33
Chain saws	23
Farm pumps and irrigating systems	8

Other Merchandise

In addition to the items shown in Table 10, Virginia farm equipment dealers sold various other items (Table 11). A relatively large number of firms sold gas and oil and hardware. A smaller number carried such items as cars and/or trucks, fertilizer and feed and seed. A few sold appliances. Occasionally a firm carried several of the above items.

Table 11. Number of Retail Farm Equipment Businesses Handling Various Other Merchandise, Virginia, 1961

Kind of merchandise	Number of firms
Gas and oil	59
Hardware	56
Cars and/or trucks	29
Feed and seed	27
Fertilizer	25
Appliances	7

Inventory

The majority of the firms, 51.2 percent, took only an annual inventory (Table 12). This practice does not provide an accurate measure of average inventory. Also, it does not reflect inventory seasonality. A monthly inventory was taken by 40.6 percent of the 219 firms. This practice provides an accurate measure of average inventory and it also reflects inventory seasonality.

Table 12. Distribution of Retail Farm Equipment Businesses, by Frequency of Taking Inventory, Virginia, 1961

Time period	Number of firms	Percent
Monthly	89	40.6
Bi-monthly	1	0.5
Quarterly	11	5.0
Semi-annually	6	2.7
Annually	112	51.2
Total	219	100.0

COMPARATIVE ANALYSIS OF FINANCIAL STATEMENTS

Sales groups, as used in this and the following sections, have been labeled A, B, C, D, E. Group A includes those firms with annual sales of $100,000 or less; Group B, those firms with sales of $100,001 to $200,000; Group C, those firms with sales of $200,001 to $300,000; Group D, those firms with sales of $300,001 to $400,000; and Group E, those firms with sales of more than $400,000.

Statement of Profit and Loss

An annual statement of profit and loss (often referred to as an operating statement) summarizes the receipts and expenses and shows the profit or loss realized by the business for a yearly period. The statement of profit and loss for the sample firms shows, in the order listed, sales, cost of goods sold, gross margin, operating expenses, profit from operations, other income, and profit before income taxes for the 1960 fiscal year. This statement provides information which is used in making management decisions.

Before proceeding with the analysis, it should be recognized that Groups A and E are open-end groups. In each case, the upper and lower limits are known. In Group A, the lowest sales obtained by a firm were $24,394.21; in Group E, the highest sales were $697,752.58 (Appendix B, Table I). Also, Groups A and E included fewer firms than the other groups. Recognition of these differences is important in making analysis of and drawing conclusions for sales groups.

Volume of Sales

Among and within analysis of variance was used to test the null hypothesis that no significant differences in volume of sales existed among sales groups. The hypothesis was rejected since the F ratio was significant at the 99 percent level of probability (Table 13).

Table 13. Among and Within Analysis of Variance of Volume of Sales, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Billion)	Mean square (Million)	F ratio
Among	4	1,234	308,554	1,405**
Within	57	12	219	
Total	61	1,246		

** Significant at 99 percent level of probability.

Separation of means was used to determine which of the arithmetic means were significantly different. The analysis revealed that the mean of each group was significantly different from that of every other group (Table 14).

The analysis presented in this section followed the expected pattern. It was suspected that each sales group would be significantly different, since the data were grouped and tabulated on the basis of sales volume. In addition to providing information on volume of sales, the analysis also provided a basis for comparing firm records by the chosen sales groups.

Table 14. Separation of Means of Volume of Sales, Based on Sales Groups, Virginia, 1960

Results:*

Group	A	B	C	D	E
Mean	73,038.24	149,085.16	236,943.40	343,278.88	509,008.92

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different. (If no line, each mean is significantly different from every other mean.)

* Based on least significant range at 99 percent level of probability.

Gross Margin

Gross margin is sales less cost of goods sold. Cost of goods sold includes purchases, assembly and handling of new equipment, cost of reconditioning used machinery and equipment, in-bound freight and express, and cost of shop labor. Assuming assembly and handling of new machinery and cost of freight to be proportional to sales, gross margins will vary among firms according to mark-up, salaries paid to service employees, and amount of reconditioning of used equipment.

With the exception of Group E, gross margins (as a percent of sales) decreased with an increase in size of business (Table 15). Group A firms obtained the highest margin as a percent of sales. In order to remain in business, smaller firms need higher margins to cover higher costs per unit of sales.

The among and within analysis of variance for gross margins (in absolute amount) showed that significant differences existed among

Table 15. Sales, Cost of Goods Sold, and Gross Margins of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales	Cost of goods sold	Gross margin	Gross margin as % of sales
A	8	$ 73,038.24	$ 59,243.42	$13,794.81	18.89
B	15	149,085.16	123,066.24	26,018.92	17.45
C	15	236,943.40	197,143.51	39,799.89	16.80
D	15	343,278.88	285,717.12	57,561.76	16.77
E	9	509,008.92	416,103.52	92,905.41	18.25
All firms	62	259,758.03	214,641.65	45,116.38	17.37

sales groups (Table 16). However, of all possible combinations, the sales group means of Groups A and B, B and C, and C and D were not significantly different (Table 17).

Table 16. Among and Within Analysis of Variance of Gross Margins, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Million)	F ratio
Among	4	36,620	9,155	24.22**
Within	57	21,549	378	
Total	61	58,169		

** Significant at 99 percent level of probability.

The median for Group E was a more representative measure of gross margin than was the arithmetic mean. This was evident since a wide difference existed between the mean and median (Appendix B, Table II).

Individual firm comparisons showed that the margins of two firms within this group were considerably above the mean and that all other margins were below the mean.

Table 17. Separation of Means of Gross Margins, Based on Sales Groups, Virginia, 1960

Results:*					
Group	A	B	C	D	E
Mean	13,794.81	26,018.92	39,799.89	57,561.76	92,905.41

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different.

* Based on least significant range at 99 percent level of probability.

Operating Expenses

Analysis of variance showed that significant differences existed among the average operating expenses for the five sales groups (Table 18).

Table 18. Among and Within Analysis of Variance of Operating Expenses, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Million)	F ratio
Among	4	24,535	6,134	29.22**
Within	57	11,966	209	
Total	61	36,501		

** Significant at 99 percent level of probability.

The average operating expenses of Groups D and E were significantly different from those of every other group (Table 19). However, average operating expenses for Groups A and B, and B and C were not significantly different at the 99 percent level of probability. (All means were significantly different at the 95 percent level of probability.)

Table 19. Separation of Means of Operating Expenses, Based on Sales Groups, Virginia, 1960

Results:*					
Group	A	B	C	D	E
Mean	13,589.79	27,042.88	38,533.65	55,023.66	78,520.94
Results:**					
Group	A	B	C	D	E
Mean	13,589.79	27,042.88	38,533.65	55,023.66	78,520.94

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different. (If no line, each mean is significantly different from every other mean.)

* Based on least significant range at 95 percent level of probability.

** Based on least significant range at 99 percent level of probability.

The operating expenses for the smaller firms, in absolute amount, were lower than those of the larger firms (Tables 20 and 21). However, as a percent of sales, the total expenses of the smaller firms were greater than those of the larger firms. Although operating expenses increased with an increase in sales, they did not increase as rapidly as sales. This implies that some economies of scale do exist.

Operating expenses for all firms averaged $42,329.19 or 16.30 percent of sales (Tables 20 and 21). Salaries, the largest single operating expense item, averaged $19,643.12 for all firms. Salaries include wages and bonuses paid to owners (and/or officers and general managers), salesmen, partsmen, and office employees. 1/

Differences in operating efficiency existed within sales groups. This was strongly suggested by the wide differences found in firms with the low and high operating expenses for each sales group (Appendix B, Table III). Inspection of individual firms within groups further indicated that those firms with the most sales did not consistently have the highest operating expenses. In each sales group, instances could be found where two firms with approximately the same sales would have considerably different operating expenses.

Profit before Income Taxes

Gross margin less operating expenses is profit from operations. Profit from operations plus other income is profit before income taxes. Other income included such items as cash and volume discounts, interest

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1/ Salaries paid to owners, officers, and/or general managers varied from none to rather large amounts. In order to put the firms on a more comparable basis, it was assumed that each person acting in the capacity of general manager for each firm would receive a salary of $5,000 for his labor. In those cases where a firm was paying less than the assumed amount, the difference was charged as a salary expense; if they were paying more than the assumed amount, the excess was added to net profits. A few firms were charged $10,000 or more for management's labor since they indicated that two persons or more were employed as full-time managers.

Table 20. Operating Expenses of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Operating expenses	Sales group A	B	C	D	E	All firms
Number of firms	8	15	15	15	9	62
Salaries	$ 7,386.61	$12,213.86	$16,431.37	$25,824.93	$38,798.39	$19,763.40
Advertising and sales promotion	223.10	1,113.07	1,525.68	2,326.87	3,389.18	1,722.13
After sale expense	147.50	1,831.81	2,435.91	1,196.25	2,246.27	1,667.04
Depreciation and rent	1,683.10	1,923.35	3,971.62	5,577.81	5,936.48	3,854.59
Auto and truck expense	529.64	1,150.17	1,138.29	2,423.75	2,154.14	1,521.09
Taxes and licenses	739.95	1,527.57	2,472.42	3,174.94	4,956.21	2,550.80
Insurance	410.02	960.92	2,003.90	2,747.47	3,493.10	1,941.98
Shop expense	273.82	837.53	1,037.19	1,653.27	2,478.93	1,248.72
Telephone and telegraph	190.74	526.89	742.57	1,211.70	1,335.52	818.76
Heat, lights, water	588.65	508.98	1,077.77	1,177.52	1,840.27	1,011.86
Professional services	146.56	418.39	351.03	680.30	603.93	457.32
Office expenses	53.93	239.93	309.92	337.03	807.00	338.67
Bad debts	214.72	802.17	266.72	1,189.50	2,953.80	1,002.87
Interest	238.85	1,458.74	962.78	1,692.36	2,087.62	1,329.16
Dues and subscriptions	11.81	219.32	75.76	269.30	200.65	167.20
Postage	28.65	25.43	292.80	301.65	566.40	235.89
Travel and entertainment	174.55	201.56	346.09	542.93	1,235.07	465.66
Repairs	145.75	571.07	990.86	1,068.49	993.00	799.34
Miscellaneous expense	401.85	512.12	2,100.96	1,627.58	2,444.98	1,432.73
Total operating expenses	$13,589.79	$27,042.88	$38,533.65	$55,023.66	$78,520.94	$42,329.19

Table 21. Operating Expenses as a Percent of Sales of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Operating expenses	Sales group A	B	C	D	E	All firms
Number of firms	8	15	15	15	9	62
			Percent of sales			
Salaries	10.11	8.19	6.93	7.52	7.62	7.61
Advertising and sales promotion	0.31	0.75	0.64	0.68	0.67	0.66
After sale expense	0.20	1.23	1.02	0.35	0.44	0.64
Depreciation and rent	2.30	1.29	1.68	1.62	1.17	1.49
Auto and truck expense	0.73	0.77	0.48	0.71	0.42	0.59
Taxes and licenses	1.01	1.02	1.04	0.92	0.97	0.98
Insurance	0.56	0.64	0.85	0.80	0.69	0.75
Shop expense	0.37	0.56	0.44	0.48	0.48	0.48
Telephone and telegraph	0.26	0.35	0.31	0.35	0.26	0.32
Heat, lights, water	0.81	0.34	0.45	0.34	0.36	0.39
Professional services	0.20	0.28	0.15	0.20	0.12	0.18
Office expense	0.07	0.16	0.13	0.10	0.16	0.13
Bad debts	0.29	0.54	0.11	0.35	0.58	0.39
Interest	0.33	0.98	0.41	0.49	0.41	0.51
Dues and subscriptions	0.02	0.15	0.03	0.08	0.04	0.06
Postage	0.04	0.02	0.12	0.09	0.11	0.09
Travel and entertainment	0.24	0.14	0.15	0.16	0.24	0.18
Repairs	0.20	0.38	0.42	0.31	0.20	0.31
Miscellaneous expense	0.55	0.34	0.89	0.47	0.48	0.55
Total operating expenses	18.61	18.13	16.27	16.03	15.42	16.30

earned, bad debts recovered, and some miscellaneous income. (Other income should not be confused with profit obtained from the sale of miscellaneous items. The sales, cost of goods sold, and gross margin for miscellaneous goods sold were included with total sales, cost of goods sold, and gross margin.)

In each group, other income added a substantial amount to profit from operations (Table 22). A large amount of variation in other income existed within sales groups (Appendix B, Table IV). This variation was expected since several firms within each group had little or no other income, while some firms had large amounts.

Table 22. Profit before Income Taxes of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Profit from operations	Other income	Profit before income taxes	Profit before income taxes as % of sales
A	8	$ 205.03	$ 411.21	$ 616.24	0.84
B	15	(1,023.96)*	1,951.65	927.69	0.63
C	15	1,266.24	4,250.40	5,516.64	2.33
D	15	2,538.10	7,593.11	10,131.21	2.95
E	9	14,384.46	10,629.58	25,014.04	4.92
All firms	62	2,787.19	4,933.60	7,720.79	2.97

* Negative figure.

The among and within analysis of variance revealed that significant differences existed among sales groups for net profit before income taxes (Table 23). However, when the individual group means were tested for significant differences, it was found that only Group E

was different from every other group (Table 24). This does not mean that the non-significant groups had comparable profits; instead, it strongly indicates that the variation within groups was so great that meaningful comparisons of profits by sales groups could not be made.

Table 23. Among and Within Analysis of Variance of Profit before Income Taxes, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Thousand)	F ratio
Among	4	3,947	986,881	7.260**
Within	57	7,748	135,930	
Total	61	11,695		

** Significant at 99 percent level of probability.

Table 24. Separation of Means of Profit before Income Taxes, Based on Sales Groups, Virginia, 1960

Results:*

Group	A	B	C	D	E
Mean	616.24	927.69	5,516.64	10,131.21	25,014.04

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different.

* Based on least significant range at 99 percent level of probability.

However, the wide differences found among profits by sales groups do warrant some general statements.

The range showed that some managers were combining resources more efficiently than other managers (Appendix B, Table V). For example, a firm in Group C showed a profit of $33,403.56. The least successful firm within the same group showed a loss of $16,503.01.

It is also noticeable that with an increase in sales volume, net profit increased at a variable rate. On the average, Group C firms were about five times as profitable as Groups A and B; Group D was about twice as profitable as C; and E was about 2.5 times as profitable as D. To protect their larger capital investment, the large firms must obtain a higher profit than the smaller firms.

Of all businesses included in the study, eighteen firms showed a net loss for the 1960 operating year. Unless these firms become more efficient, many will be forced to leave the farm equipment industry.

Balance Sheet

A balance sheet depicts the financial condition of a business as of a specific date. The balance sheet shows the assets, the liabilities, and the proprietary equity of the business. The types of assets and liabilities of a business are important in business analysis. From an individual business standpoint, changes in the various balance sheet accounts affect the financial position of the business.

Total Assets

The average total assets for all firms was $143,764.24. They were composed of $117,138.33 of total current assets, $24,393.92 fixed assets,

and $2,231.99 other assets (Table 25). Other assets included all deferred charges and prepaid expenses. Current assets per firm accounted for 81.48 percent of the total investment for all firms. The average total current assets varied from 79.64 percent of total assets for Group C to 85.03 percent of total assets for Group A.

The largest single asset item was inventory. Inventory included new machinery, used machinery, parts, and all other saleable merchandise on hand, such as cars, trucks, garden and lawn equipment, etc. A departmental breakdown of inventory for the sixty-two dealers was not possible, since several firms did not include this information in their financial statements. However, inventory was 55.09 percent of total assets, or approximately five out of every ten dollars of total investment was in inventory. Inventory by sales groups varied from 47.25 percent of total assets for Group A to 59.83 percent of total assets for Group C.

As a percent of total assets, the remaining current assets were composed of 6.44 percent cash and marketable securities, 12.15 percent accounts receivable, 7.10 percent notes receivable, and 0.70 percent other current assets. Other current assets included such things as financial reserves and contracts in transit.

The sixty-two dealers had an average of $24,393.92 invested in fixed assets. Fixed assets included land, buildings, shop equipment and tools, cars and trucks, office equipment and furniture, and other depreciable or non-depreciable fixed assets such as investments in real estate, driveways, fences, etc. Other assets averaged $2,231.99 per firm.

Table 25. Total Assets of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Item	Sales group A	B	C	D	E	All firms
Number of firms	8	15	15	15	9	62
Cash and securities	$ 7,335.53	$ 5,066.15	$ 6,389.61	$ 10,680.54	$ 20,337.20	$ 9,254.25
Accounts receivable	10,823.22	11,064.88	12,527.13	21,592.89	35,418.63	17,469.79
Notes receivable	4,867.00	3,745.19	6,115.73	8,536.47	35,281.12	10,200.44
Inventory	28,802.23	53,979.16	79,717.75	103,628.54	124,450.92	79,199.32
Other current assets	-0-	202.04	1,365.21	640.75	3,309.03	1,014.53
Total current assets	$51,827.98	$74,057.41	$106,115.43	$145,079.19	$218,796.90	$117,138.33
Fixed assets	9,109.26	15,667.47	24,134.05	31,207.27	41,601.86	24,393.92
Other assets	15.13	1,508.16	3,000.82	3,113.43	2,625.16	2,231.99
Total assets	$60,952.37	$91,233.04	$133,250.30	$179,419.89	$263,023.92	$143,764.24
			Percent of total assets			
Cash and securities	12.04	5.54	4.80	5.95	7.73	6.44
Accounts receivable	17.76	12.13	9.40	12.03	13.47	12.15
Notes receivable	7.98	4.11	4.59	4.76	13.41	7.10
Inventory	47.25	59.17	59.83	57.76	47.32	55.09
Other current assets	-0-	0.22	1.02	0.36	1.26	0.70
Total current assets	85.03	81.17	79.64	80.86	83.19	81.48
Fixed assets	14.94	17.18	18.11	17.39	15.82	16.97
Other assets	0.03	1.65	2.25	1.75	0.99	1.55
Total assets	100.00	100.00	100.00	100.00	100.00	100.00

The among and within analysis of variance for total assets revealed that significant differences existed among sales groups (Table 26).

Table 26. Among and Within Analysis of Variance of Total Assets, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Million)	F ratio
Among	4	244,989	61,247	9.70**
Within	57	359,855	6,313	
Total	61	604,844		

** Significant at 99 percent level of probability.

Separation of means further revealed that the average total assets of Groups D and E were not significantly different (Table 27). Also, significant differences did not exist among Groups A and C, B and C, C and D, and A and B. Again, this is an indication that a large amount of variation exists within groups.

Table 27. Separation of Means of Total Assets, Based on Sales Groups, Virginia, 1960

Results:*

Group	A	B	C	D	E
Mean	60,952.37	91,233.04	133,250.30	179,419.89	263,023.92

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different.

* Based on least significant range at 99 percent level of probability.

The coefficient of variation for total assets was more than 30 percent for each of the five sales groups (Appendix B, Table VI). The variation is further reflected by the range. Also, in each group, the arithmetic mean and median were very dissimilar. Further research is needed to explain causes of such large variation.

Total Liabilities

Individuals and institutions (other than the proprietors) owned 46.38 percent of the average assets used in these businesses (Table 28).

Current liabilities averaged $55,840.68 for the sixty-two dealers in the sample; long-term liabilities amounted to $10,836.22. As a percent of total assets, total current liabilities averaged 38.84 percent, and long-term liabilities, 7.54 percent.

The total current liabilities per firm consisted of $18,773.77 of accounts payable, $33,545.07 of notes payable, and $3,521.84 of accrued liabilities. 1/

Long-term debt ranged from none for Group A to 14.06 percent of total assets for Group D. Of the sixty-two farm machinery and equipment businesses, forty-one firms did not have long-term debt (Table 29). One firm had long-term liabilities of less than $10,000, while approximately 25 percent of the dealers had long-term indebtedness of from $11,000 to $40,000. Four firms, or 6.5 percent, had long-term debt of over $40,000.

1/ Accrued liabilities are those expenses which have been incurred, but have not been paid. They include such items as wages, interest, taxes, and rent.

Table 28. Total Liabilities and Net Worth of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Item	Sales group A	B	C	D	E	All firms
Number of firms	8	15	15	15	9	62
Accounts payable	$ 8,603.44	$12,698.72	$ 20,015.85	$ 22,245.32	$ 30,083.09	$ 18,773.77
Notes payable	6,445.07	29,990.15	33,016.22	36,818.79	58,984.07	33,545.07
Accrued liabilities	702.11	2,231.03	1,413.93	2,273.90	13,772.72	3,521.84
Total current liabilities	$15,750.62	$44,919.90	$ 54,446.00	$ 61,338.01	$102,839.88	$ 55,840.68
Long-term liabilities	-0-	6,980.10	8,082.04	25,233.02	7,490.88	10,836.22
Total liabilities	$15,750.62	$51,900.00	$ 62,528.04	$ 86,571.03	$110,330.76	$ 66,676.90
Net worth	45,201.75	39,333.04	70,722.26	92,848.86	152,693.16	77,087.34
Total liabilities and net worth	$60,952.37	$91,233.04	$133,250.30	$179,419.89	$263,023.92	$143,764.24
			Percent of total assets			
Accounts payable	14.12	13.92	15.02	12.40	11.43	13.06
Notes payable	10.57	32.87	24.78	20.52	22.43	23.33
Accrued liabilities	1.15	2.45	1.06	1.27	5.24	2.45
Total current liabilities	25.84	49.24	40.86	34.19	39.10	38.84
Long-term liabilities	-0-	7.65	6.07	14.06	2.85	7.54
Total liabilities	25.84	56.89	46.93	48.25	41.95	46.38
Net worth	74.16	43.11	53.07	51.75	58.05	53.62
Total liabilities and net worth	100.00	100.00	100.00	100.00	100.00	100.00

Table 29. Distribution of 62 Retail Farm Equipment Businesses, by Amount of Long-Term Liabilities, Virginia, 1960

Amount of long-term liabilities (Thousand)	Number of firms	Percent of firms
None	41	66.1
$ 1 - 10	1	1.6
11 - 20	8	12.9
21 - 30	5	8.1
31 - 40	3	4.8
Over 40	4	6.5
Totals	62	100.0

The total accounts payable for all groups was $18,553.42 (Table 30). Accounts payable per firm by sales groups varied from a low of $8,603.44 for Group A to a high of $30,083.09 for Group E. As a percent of total assets, there was considerable variation among groups. Average accounts payable varied from 11.43 percent for Group E to 15.02 percent for Group C.

Notes payable per firm averaged $33,545.07 (Table 31). Notes payable per firm increased from a low of $6,445.07 for Group A to $58,984.07

Table 30. Accounts Payable of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	Number of firms	Accounts payable	Accounts payable as % of total assets
A	8	$ 8,603.44	14.12
B	15	11,787.95	13.46
C	15	20,015.85	15.02
D	15	22,245.32	12.40
E	9	30,083.09	11.43
All groups	62	18,553.42	12.99

for Group E. Average notes payable for Groups B, C, and D varied only slightly in terms of dollars. As a percent of total assets, notes payable varied from 10.57 percent for Group A to 32.34 percent for Group B.

Table 31. Notes Payable of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	Number of firms	Notes payable	Notes payable as % of total assets
A	8	$ 6,445.07	10.57
B	15	29,990.15	32.34
C	15	33,016.22	24.78
D	15	36,818.79	20.52
E	9	58,984.07	22.43
All groups	62	33,545.07	23.20

The computed value of the F ratio for total liabilities was significant (Table 32). However, of all possible combinations, the arithmetic means of only Groups A and D, and A and E were significantly different (Table 33).

Table 32. Among and Within Analysis of Variance of Total Liabilities, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Million)	F ratio
Among	4	46,744	11,686	4.53**
Within	57	146,922	2,577	
Total	61	193,666		

** Significant at 99 percent level of probability.

Table 33. Separation of Means of Total Liabilities, Based on Sales Groups, Virginia, 1960

Results:*					
Group	A	B	C	D	E
Mean	15,750.62	51,900.00	62,528.04	86,571.03	110,330.76

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different.

* Based on least significant range at 99 percent level of probability.

The variation of total liabilities within sales groups was even greater than that of total assets. The coefficient of variation ranged from 58.79 percent for Group A to 94.46 percent for Group B (Appendix B, Table VII). However, the mean and median for Groups A, C, and D were similar. The range in total liabilities by sales groups showed that some firms have small amounts of liabilities compared to greater amounts for other firms within the same sales group (Appendix B, Table VII).

Net Worth

The F ratio for net worth was significant (Table 34). The average net worth for Group E was significantly different from that of every other group (Table 35). The mean for Group D was different for Groups A and B, but not C. Also, the combinations of Groups A and B, A and C, and B and C were not significantly different.

Net worth for each sales group was also characterized by a large amount of variation (Appendix B, Table VIII). Sales Group D had the

Table 34. Among and Within Analysis of Variance of Net Worth, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Million)	F ratio
Among	4	85,294	21,323	5.71**
Within	57	212,776	3,733	
Total	61	298,070		

** Significant at 99 percent level of probability.

smallest coefficient of variation, which was 60.60 percent. The range by sales groups showed that at least two firms had extremely and almost unbelievably small net worths. These firms are operating almost entirely on borrowed capital.

Table 35. Separation of Means of Net Worth, Based on Sales Groups, Virginia, 1960

Results:*

Group	A	B	C	D	E
Mean	60,952.37	91,233.04	133,250.30	179,419.89	263,023.92

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different.

* Based on least significant range at 99 percent level of probability.

Returns to Management

Returns to management, as used here, are the net profit left to the business after all operating expenses have been paid, and after allowing for cost of management's labor and for opportunity cost on net worth. Returns to management are based on the following assumptions:

(1) Interest was paid on all borrowed capital;

(2) The opportunity cost of net worth was five percent annually;

(3) The manager's labor was worth $5,000 per person on an annual basis.

With these assumptions, returns to management should reflect more realistically the success of management in operating the business. The assumption concerning the value of manager's labor was made to alleviate the wide differences existing in actual salaries paid to owners, officers, and/or general managers.

The opportunity cost of net worth for Groups A and B exceeded the net profit obtained by these groups (Table 36). This suggests that the owners of the capital invested in some of these businesses would have realized greater returns if their capital had been invested at the opportunity cost of five percent annually.

It is equally important to note that the opportunity cost of the average net worth for Groups D and E was substantially below the actual net profit realized by these businesses. This further illustrates that a direct relationship exists between volume of sales and net profits.

Table 36. Returns to Management of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Profit before income taxes	1960 net worth	5% interest on net worth	Returns to management
A	8	$ 616.24	$ 45,201.75	$2,260.09	($ 1,643.85)*
B	15	927.69	39,333.04	1,966.65	(1,038.96)*
C	15	5,516.64	70,722.26	3,536.11	1,980.53
D	15	10,131.21	92,848.86	4,642.44	5,488.77
E	9	25,014.04	152,693.16	7,634.66	17,379.38
All firms	62	7,720.79	77,087.34	3,854.37	3,866.42

* Negative figure.

Business Ratios

Several financial and operating ratios were computed for each sales group and for all firms. In addition to providing a measure of the financial condition of the sample businesses, the ratios will be useful to managers in comparing individual firm ratios with the average of several similar firms.

The ratios are presented in three sections, which have been labeled capital relationship ratios, profit relationship ratios, and merchandise relationship ratios. This procedure was followed because the ratios presented in each section are closely related.

Capital Relationship Ratios

Sales to Net Working Capital: The ratio of sales to net working capital is a measure of capital use efficiency. With a given sales volume, a business with a smaller amount of net working capital than another business will have a higher rate of net working capital turnover. A slow turnover is generally associated with an inefficient use of capital. An excessively fast turnover can mean that a business is limiting its potential because of a lack of operating capital.

Of the five sales groups, Group A had the lowest net working capital turnover and Group B had the highest (Table 37). The variation in sales to net working capital existing among the sales groups is partially explained by the relationship of current assets to current

Table 37. Capital Relationship Ratios of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales to net working capital	Cash and receivables to current liabilities	Current assets to current liabilities
A	8	2.02	1.46	3.29
B	15	5.12	0.44	1.65
C	15	4.59	0.46	1.95
D	15	4.10	0.67	2.37
E	9	4.39	0.89	2.13
All firms	62	4.24	0.66	2.10

liabilities. Group A firms had a slower turnover than Group B and the other groups because they had more current assets per dollar of current liabilities.

Cash and Receivables to Current Liabilities: The cash and receivables to current liabilities ratio measures liquidity. It differs from the current assets to current liabilities ratio in that it does not include inventory. A direct relationship exists between the ratio and the liquidity of a firm. The higher the ratio, the more liquid the business; the lower the ratio, the less liquid the business. In most small businesses, a ratio of one dollar of cash and receivables for each one dollar of current liabilities is regarded as being satisfactory.

As a group, the sixty-two firms had approximately 65 cents of cash and receivables per dollar of current liabilities. On the average, Group A firms were in a more liquid position than the other sales groups.

Current Assets to Current Liabilities: The current ratio, or the current assets to current liabilities ratio, indicates the ability of a firm to meet its current obligations. A ratio of two to one means that for each dollar of debt, the business had two dollars of current assets which can be converted into cash in a rather short period of time. A ratio of less than two to one in many businesses is considered as being unsafe, or that the business is approaching financial difficulty.

In addition to being most liquid, Group A firms were also in a better position to meet their current debt. The ratio indicates that

Group A firms had considerably more dollars of current assets per dollar of current liabilities than any of the other groups. Group B had fewer dollars of current assets per dollar of current liabilities than any other group.

Profit Relationship Ratios

Gross Margin to Sales: A manager strives to obtain the highest margin possible commensurate with his sales objective. For each individual sale or business transaction, it is necessary to consider the marginal revenue in relation to the marginal cost--both in the present and future. Yet, over a long period, gross margins must be sufficient to cover operating expenses plus a reasonable profit. Margins obtained by other firms of similar size in the same type of business provide a guide as to the general mark-up of competitive firms and as to the limits within which operating expenses must be maintained.

Gross margins to sales were discussed in the section dealing with the profit and loss statement, page 38. However, gross margins to sales are shown by sales groups in Table 38.

Net Profit to Sales: The ratio of net profit to sales reflects the over-all efficiency of a business.

For each one dollar of sales, the sixty-two sample firms realized an average net profit of 2.97 cents (Table 38). However, net profit was less than one cent per dollar of sales for Groups A and B. Groups C and D obtained net profits of 2.33 cents and 2.95 cents per dollar

of sales. Group E firms obtained net profits of about 5 cents per dollar of sales.

Table 38. Profit Relationship Ratios of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Gross margin to sales	Net profit to sales	Net profit to net worth
		(Percent)	(Percent)	(Percent)
A	8	18.89	0.84	1.36
B	15	17.45	0.63	2.36
C	15	16.80	2.33	7.80
D	15	16.77	2.95	10.91
E	9	18.25	4.92	16.42
All firms	62	17.37	2.97	10.02

Net Profit to Net Worth: Net profit expressed as a percentage of net worth indicates the return on owner's equity that is being realized by the business. The returns to the business should be equal to or greater than what the capital would return if invested in some alternative enterprise. The net profit to net worth ratio differs from returns to management in that it does not allow for an opportunity cost on the capital invested in the business.

The return on the capital invested by the smaller businesses was considerably below that of the larger businesses. The ratio for Groups A and B was less than three percent. Unless these firms can become more efficient, the owners of the capital invested should consider investing their capital in a more profitable enterprise.

Merchandise Relationship Ratios

Inventory Turnover: Inventory turnover is cost of goods sold divided by average inventory. A rapid turnover is associated with good merchandising and an adequate inventory control. Firm managers should attempt to maintain an inventory at a level which is consistent with sales.

Due to seasonality, inventory will fluctuate throughout the year. In order to eliminate seasonality, yearly inventory turnover should be based on the average monthly inventory. Since a small proportion of dealers keeps inventory on a monthly basis, it was necessary to use the beginning and ending inventories in arriving at the inventory turnovers for the various sales groups. Firm managers should be aware of this when comparing their turnovers with those presented in Table 40.

It was suspected that no significant differences would exist among the average inventory turnovers for the various sales groups. The analysis of variance verified these suspicions since the F ratio was not significant (Table 39).

All sales groups were characterized by a large amount of variation. Also, the range given for inventory turnover for each sales group showed extreme differences. The coefficient of variation for Group D was 71 percent, and inventory turnover ranged from a low of 1.48 to a high of 10.53 (Appendix B, Table X).

It should be noted that, on the average, Group A firms obtained the lowest turnover and Group E the highest. However, this analysis

indicates that inventory turnover is not associated with volume of sales.

Table 39. Among and Within Analysis of Variance of Inventory Turnover, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares	Mean square	F ratio
Among	4	21.718	5.430	1.58
Within	57	195.930	3.437	
Total	61	217.648		

Inventory to Net Working Capital: Average inventory expressed as a percent of net working capital serves as a guide in determining whether too much capital is invested in inventory. When this ratio exceeds 100 percent, firm managers should consider reducing inventory.

Table 40. Merchandise Relationship Ratios of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Inventory turnover	Inventory to net working capital (Percent)
A	8	1.81	90.51
B	15	2.31	183.11
C	15	2.37	161.03
D	15	2.71	126.10
E	9	3.37	106.54
All firms	62	2.66	131.70

It is important to note that the ratio for each of Groups B, C, and D was well above the given standard (Table 40). This strongly indicates that these groups may have too much capital tied up in inventory. Firms with an inventory to net working capital ratio of more than 100 percent should make a detailed appraisal of merchandise on hand. The ratio for Group A was lower than those of the other groups because Group A firms had more current assets.

Number of Employees

Number of employees is expressed as the number of man equivalents employed during the year. When a single employee was engaged in two or more jobs, his time was allocated to specified departments by the manager's estimate of the time spent in each. For example, if an employee had spent 50 percent of his time doing office work and 50 percent selling parts, half a man was allocated to each of these departments. If a person had worked for the business less than a year, the fraction of the year worked was recorded.

The typical Virginia farm equipment business employs about nine people (Table 41). Of these, 1.31 do sales work; about four people repair machinery; and 1.20 persons sell parts.

About one full-time office worker was employed by the average farm equipment business. In general, the smaller businesses employed less than a full-time office worker, while the larger firms employed more than one office worker. In many of the smaller firms, the office

Table 41. Number of Employees of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Total	Sales-men	Office workers	Owners, officers, and/or managers	Parts-men	Shop-men	Delivery-men	Janitors
A	8	4.76	0.46	0.71	0.54	0.69	2.19	0.09	0.08
B	15	6.13	0.84	0.96	0.82	0.88	2.47	0.13	0.03
C	15	8.54	1.42	0.91	1.12	1.10	3.42	0.47	0.10
D	15	12.38	1.66	1.25	1.67	1.42	5.56	0.67	0.15
E	9	14.60	2.11	1.45	1.89	2.00	6.00	0.94	0.21
All firms	62	9.28	1.31	1.06	1.22	1.20	3.92	0.46	0.11

work was performed by persons who also were responsible for other activities.

The sixty-two farm equipment businesses were managed by an average of 1.22 persons. In several instances, the owner of a small business was performing activities of salesman, partsman, office worker, and others. Also, some of the larger businesses which were owned by more than one person indicated that management duties were divided between two or more persons. In these cases, the time spent performing duties not directly associated with management was allocated accordingly.

Sales per Employee

A more detailed analysis of labor cost and labor efficiency was not made because of limited information. Relatively few firms gave salaries paid by type of worker, and in some instances cost of service labor could not be separated from cost of goods sold. However, relating number of employees to sales does provide a rough measure of labor efficiency.

The among and within analysis of variance for sales per employee showed that significant differences existed among sales groups (Table 42). Separation of means further revealed that the average amount of sales per employee for Group E was significantly different from Groups A and B. However, Groups C, D, and E were not different from each other, and neither were Groups B, C, and D.

The arithmetic mean and median were about the same for each sales group. The range showed that some firms were obtaining substantially

more sales per employee than other firms within the same sales group. The variation was greatest within Group A. Again, this could have been due to the lesser number of firms included in this group (Appendix B, Table IX).

Table 42. Among and Within Analysis of Variance of Sales per Employee, Based on Sales Groups, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Million)	Mean square (Thousand)	F ratio
Among	4	1,638	409,497	8.55**
Within	57	2,730	47,906	
Total	61	4,368		

** Significant at 99 percent level of probability.

Table 43. Separation of Means of Sales per Employee, Based on Sales Groups, Virginia, 1960

Results:*

Group	A	B	C	D	E
Mean 1/	16,222.81	26,060.57	28,742.35	28,819.10	36,784.77

Note: Any two means not underscored by the same line are significantly different. Any two means underscored by the same line are not significantly different.

* Based on least significant range at 99 percent level of probability.

1/ Simple average, not weighted average.

Gross Margin by Departments

Gross margin for departments indicates to management the productivity of sales in each department. The least or most profitable department cannot be determined from gross margin alone. If operating costs were known, management could then determine which departments are the most efficient, which might be expanded, and which needs managerial reorganization.

Of the sixty-two firms used in the study, only thirty-three firms kept records of sales, cost of goods sold, and gross margin on a departmental basis. This is another indication that a large number of Virginia farm equipment dealers lacks the type of records necessary for sound business management.

New Equipment Department

In general, sales of new equipment exceeded the sales of any other department (Table 46). In given localities, an individual firm may sell more used than new equipment, depending upon the demand for such equipment.

Gross margin on new equipment averaged 20.57 percent of sales for these thirty-three firms. Gross margin, as a percent of sales, varied only slightly among sales groups. Since mark-up is usually a certain proportion of the cost of new equipment, size of business would be expected to have little effect on gross margin.

Table 44. Sales, Cost of Goods Sold, and Gross Margin of New Equipment Department of 33 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales	Cost of goods sold	Gross margin	Percent of sales
A	4	$ 30,070.08	$ 23,518.43	$ 6,551.65	21.79
B	7	67,575.72	54,564.83	13,010.89	19.25
C	9	138,478.20	108,307.46	30,170.74	21.79
D	9	159,238.33	127,458.09	31,780.24	19.96
E	4	259,240.68	206,315.83	52,924.86	20.41
All firms	33	130,597.63	103,732.75	26,864.88	20.57

Used Equipment Department

The used equipment department showed a loss for all sales groups (Table 45). Before any operational costs, all firms lost an average of $6,815.37 on used equipment. The average loss by Group E firms was substantially above that of the other groups.

More detailed research is needed to determine causes for the non-profitability of the used equipment department. However, it is speculated that these losses occur because farm equipment dealers tend to make over-allowances for used equipment items taken in as partial payment for new equipment. In effect, this action on the part of the dealer lowers the retail price of the new equipment unit. Thus, the problem becomes that of price competition rather than management's inability to evaluate correctly the present value of the used equipment unit.

Table 45. Sales, Cost of Goods Sold, and Gross Margins of Used Equipment Department of 33 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales	Cost of goods sold	Gross margin	Percent of sales
A	4	$ 7,719.22	$ 7,734.67	($ 15.45)*	(0.20)*
B	7	26,686.13	28,427.42	(1,741.28)*	(6.53)*
C	9	47,603.84	53,692.74	(6,088.90)*	(12.79)*
D	9	51,354.11	59,658.71	(8,304.60)*	(16.17)*
E	4	81,283.51	102,062.22	(20,778.71)*	(25.56)*
All firms	33	43,437.44	50,252.80	(6,815.37)*	(15.69)*

* Negative figure.

Parts Department

The parts department returned a higher gross margin in relation to sales than any other department. Comparison of gross margins as a percent of sales for all departments revealed that the margin obtained on parts was substantially above that of the other departments (Table 46).

Table 46. Sales and Gross Margins of All Firms, by Department, Virginia, 1960

Department	Sales	Gross margin as % of sales
New	$130,597.63	20.57
Used	43,437.44	(15.69)*
Parts	52,327.29	27.55
Service	15,927.05	16.44
Miscellaneous	10,116.90	18.07

* Negative figure.

The margin on parts varied from a low of 20.29 percent for Group A to a high of 29.04 percent for Group B (Table 47). Groups A, B, and C sold considerably less parts than did Groups D and E. A large capital investment is required to maintain an adequate inventory of parts. Since small dealers operate on a low capital investment, it is difficult for these firms to maintain a large inventory of parts.

Table 47. Sales, Cost of Goods Sold, and Gross Margins of Parts Department of 33 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales	Cost of goods sold	Gross margin	Percent of sales
A	4	$20,987.72	$16,729.24	$ 4,258.48	20.29
B	7	28,360.25	20,125.51	8,234.74	29.04
C	9	38,431.88	28,050.47	10,381.41	27.01
D	9	85,698.85	61,053.52	24,645.34	28.76
E	4	81,787.84	60,313.32	21,474.52	26.26
All firms	33	52,327.29	37,908.63	14,418.66	27.55

Service Department

There was considerable difference in service sales among sales groups. For example, sales for Group B were greater than for Group A, but sales by Group C were about half those of Group B (Table 48). Likewise, gross margins as a percent of sales did not follow the expected pattern. Groups A and E had considerably lower margins than did the other groups. Also, the margins on service varied from 1.05 percent to 21.24 percent.

The variation in sales and margins may be due to the emphasis placed on the sale of service labor by the different farm equipment firms. Some businesses maintain a sizeable shop, while others concentrate more on the sale of new machinery, used machinery, and particularly parts because of the higher mark-up. Some firm managers feel that they are forced to maintain a shop because of competition. Also, many dealers feel that a good shop attracts customers to their business.

Table 48. Sales, Cost of Goods Sold, and Gross Margins of Service Department of 33 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales	Cost of goods sold 1/	Gross margin	Percent of sales
A	4	$ 3,338.79	$ 3,303.79	$ 35.00	1.05
B	7	18,445.52	15,040.18	3,405.34	18.46
C	9	9,337.34	7,562.88	1,774.46	19.00
D	9	20,583.80	16,212.35	4,371.45	21.24
E	4	28,457.16	26,680.31	1,776.86	6.24
All firms	33	15,927.05	13,308.93	2,618.12	16.44

1/ Cost of goods sold represents salaries of service employees and other goods sold through the service department.

Miscellaneous Department

The miscellaneous department includes the sale of other allied lines. Common items sold included garden and lawn equipment, feed and seed, hardware, fertilizer, etc. The sale of these items adds diversification to the farm equipment business.

The figures pertaining to this department (Table 49) are characterized by a large amount of variability and inconsistency. For example, while the margin for Group E firms was 27.91 percent, Group A firms had a negative margin of 19.32 percent. Correspondingly, sales varied from a high of $38,497.62 to a low of $499.14.

It is difficult to explain the variation existing among the sales groups. However, many dealers are willing to carry these items simply as a service to potential farm machinery customers.

Table 49. Sales, Cost of Goods Sold, and Gross Margins of Miscellaneous Department of 33 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Sales group	No. of firms	Sales	Cost of goods sold	Gross margin	Percent of sales
A	4	$ 499.14	$ 595.57	($ 96.43)*	(19.32)*
B	7	4,500.40	4,148.41	351.99	7.82
C	9	3,206.29	3,239.57	(33.28)*	(1.04)*
D	9	13,056.81	11,325.91	1,730.90	13.26
E	4	38,497.62	27,753.58	10,744.04	27.91
All firms	33	10,116.90	8,288.63	1,828.27	18.07

* Negative figure.

Financial Statements by Profit Groups

The average financial statements by sales groups were characterized by considerable variation. Therefore, the average statements are not very representative. These averages do not show what the more profitable firms of similar size were doing with available resources. In order to provide information which would allow managers to make

better comparisons, the financial statements were separated and tabulated on the basis of profit groups. Statements of profit and loss and balance sheets by profit groups are presented in Appendix C, by sales groups.

Statement of Profit and Loss

A comparison of the sixty-two firms on the basis of thirty-one low profit firms and thirty-one high profit firms showed that the high profit group had considerably more sales than did the low profit group (Table 50). The sales of the high profit group amounted to $331,503.09 compared to $188,012.97 for the low profit group. Likewise, the high profit group also had the largest gross margin.

In addition to having a larger margin, the high profit firms also had less total expenses when expressed as a percentage of sales (Table 51). These two factors, and the fact that the high profit group had more other income, accounted for a large part of the difference existing in net profits between the two profit groups. The high profit firms showed a profit of $16,614.84, compared to a loss of $1,173.25 for the low profit group.

Total Assets

In absolute amount, the high profit group had more capital invested in total assets than did the low profit group (Table 52). The high profit group had total assets of $177,627.75, compared to $109,900.73 for the low profit group.

As a percent of total assets, the low profit group had the most total current assets. The difference between the total current assets of the two groups was due mainly to the larger inventory of the low profit group.

Table 50. Statement of Profit and Loss of All Firms, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	All firms
Number of firms	31	31	62
SALES	$188,012.97	$331,503.09	$259,758.03
COST OF GOODS SOLD	157,889.92	271,393.37	214,641.65
GROSS MARGIN	30,123.05	60,109.72	45,116.38
EXPENSES:			
Salaries	15,377.43	24,149.37	19,763.40
Advertising and sales promotion	1,318.14	2,126.11	1,722.13
After sale expense	1,433.88	1,900.19	1,667.04
Depreciation and rent	3,136.46	4,572.73	3,854.59
Auto and truck expense	1,212.45	1,829.73	1,521.09
Taxes and licenses	1,852.65	3,248.95	2,550.80
Insurance	1,643.02	2,240.93	1,941.98
Shop expense	966.44	1,531.00	1,248.72
Telephone and telegraph	578.29	1,059.23	818.76
Heat, lights, water	780.58	1,243.15	1,011.86
Professional services	392.95	521.68	457.32
Office expense	256.70	420.64	338.67
Bad debts	782.46	1,223.28	1,002.87
Interest	1,394.53	1,263.78	1,329.16
Dues and subscriptions	144.20	190.19	167.20
Postage	185.10	286.68	235.89
Travel and entertainment	434.24	497.07	465.66
Repairs	701.82	896.87	799.34
Miscellaneous expense	1,371.16	1,494.30	1,432.73
TOTAL EXPENSES	33,962.50	50,695.88	42,329.19
PROFIT FROM OPERATIONS	(3,839.45)*	9,413.84	2,787.19
OTHER INCOME	2,666.20	7,201.00	4,933.60
PROFIT BEFORE INCOME TAXES	(1,173.25)*	16,614.84	7,720.79

* Negative figure.

The high profit firms had the most capital invested in fixed assets. In absolute amount, the typical high profit firm had fixed assets in the amount of $33,340.04, as compared to only $15,447.79 for the typical low profit firm.

Table 51. Statement of Profit and Loss as a Percent of Sales of All Firms, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	All firms
Number of firms	31	31	62
	Percent of sales		
SALES	100.00	100.00	100.00
COST OF GOODS SOLD	83.98	81.87	82.63
GROSS MARGIN	16.02	18.13	17.37
EXPENSES:			
Salaries	8.18	7.27	7.61
Advertising and sales promotion	0.70	0.64	0.66
After sale expense	0.76	0.57	0.64
Depreciation and rent	1.67	1.38	1.49
Auto and truck expense	0.64	0.55	0.59
Taxes and licenses	0.99	0.98	0.98
Insurance	0.87	0.68	0.75
Shop expense	0.51	0.46	0.48
Telephone and telegraph	0.31	0.32	0.32
Heat, lights, water	0.42	0.38	0.39
Professional services	0.20	0.16	0.18
Office expense	0.14	0.13	0.13
Bad debts	0.42	0.37	0.39
Interest	0.74	0.38	0.51
Dues and subscriptions	0.08	0.06	0.06
Postage	0.10	0.09	0.09
Travel and entertainment	0.23	0.15	0.18
Repairs	0.37	0.27	0.30
Miscellaneous expense	0.73	0.45	0.55
TOTAL EXPENSES	18.06	15.29	16.30
PROFIT FROM OPERATIONS	(2.04)*	2.84	1.07
OTHER INCOME	1.42	2.17	1.90
PROFIT BEFORE INCOME TAXES	(0.62)*	5.01	2.97

* Negative figure.

Table 52. Total Assets of All Firms, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	All firms
Number of firms	31	31	62
Cash and marketable securities	$ 4,687.45	$ 13,821.04	$ 9,254.25
Accounts receivable	13,677.06	21,262.52	17,469.79
Notes receivable	3,540.56	16,860.32	10,200.44
Other current assets	490.18	1,538.89	1,014.53
Inventory	70,234.54	88,164.10	79,199.32
Total current assets	$ 92,629.79	$141,646.87	$117,138.33
Fixed assets	15,447.79	33,340.04	24,393.92
Other assets	1,823.15	2,640.84	2,231.99
Total assets	$109,900.73	$177,627.75	$143,764.24
	Percent of total assets		
Cash and marketable securities	4.27	7.78	6.44
Accounts receivable	12.44	11.97	12.15
Notes receivable	3.22	9.49	7.10
Other current assets	0.45	0.87	0.70
Inventory	63.90	49.63	55.09
Total current assets	84.28	79.74	81.48
Fixed assets	14.06	18.77	16.97
Other assets	1.66	1.49	1.55
Total assets	100.00	100.00	100.00

Total Liabilities and Net Worth

In absolute amount, the high profit group had more total indebtedness than did the low profit group; but as related to total assets, the total liabilities of the high profit group were considerably below those of the low profit group (Table 53). The total liabilities of the high profit firms were 39.45 percent of total assets, while those of the low profit group were 57.57 percent of total assets.

Table 53. Total Liabilities and Net Worth of All Firms, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	All firms
Number of firms	31	31	62
Accounts payable	$ 20,708.03	$ 16,839.51	$ 18,773.77
Notes payable	30,703.19	36,386.95	33,545.07
Accrued liabilities	1,953.15	5,090.53	3,521.84
Total current liabilities	$ 53,364.37	$ 58,316.99	$ 55,840.68
Long-term liabilities	9,910.05	11,762.39	10,836.22
Total liabilities	$ 63,274.42	$ 70,079.38	$ 66,676.90
Net worth	46,626.31	107,548.37	77,087.34
Total liabilities and net worth	$109,900.73	$177,627.75	$143,764.24
	Percent of total assets		
Accounts payable	18.84	9.48	13.06
Notes payable	27.94	20.48	23.33
Accrued liabilities	1.78	2.87	2.45
Total current liabilities	48.56	32.83	38.84
Long-term liabilities	9.01	6.62	7.54
Total liabilities	57.57	39.45	46.38
Net worth	42.43	60.55	53.62
Total liabilities and net worth	100.00	100.00	100.00

A relatively small difference existed in long-term liabilities between the two groups. However, the current liabilities as a percent of assets for the low profit group were considerably above those of the high profit group. The higher accounts and notes payable of the low profit firms accounted for most of the differences in indebtedness between the two profit groups.

The high profit group owned 60.55 percent of their total assets, compared to only 42.43 percent for the low profit group. In absolute

amount, the net worth of the high profit group was $107,548.37, compared to $46,626.31 for the low profit group.

FACTORS AFFECTING NET PROFITS

Method of Regression Analysis

The preceding section indicated that net profits are highly variable and are influenced by several factors. The large variation made it difficult to formulate conclusions about net profits and related factors. Therefore, multiple regression techniques were employed to evaluate more effectively the effects of selected factors on net profits.

Hypotheses and Procedure

The variables used in the regression and how they were expected to affect net profits were as follows:

(1) Volume of sales - it was hypothesized that volume of sales and net profit would be directly correlated.

(2) Other income - since other income was added to profit from operations to obtain the dependent variable (net profits), it was expected that net profit and other income would be directly correlated.

(3) Gross margin - a direct relationship was expected to exist between net profit and gross margin.

(4) Operating expenses - an inverse relationship was expected to exist between net profit and operating expenses.

(5) Advertising - it was believed that net profit and the amount spent for advertising would be directly related.

(6) Inventory turnover - it was expected that as inventory turnover increases, net profits would also increase.

(7) Sales per employee - it was believed that net profit and sales per employee would be directly correlated.

(8) Total assets - net profit and total assets were expected to be directly correlated.

(9) Accounts receivable, (10) Accounts payable, and

(11) Other liabilities 1/ - an indirect relationship was expected to exist between each of these variables and net profit.

(12) Net working capital - it was believed that a curvilinear relationship would exist between net profit and net working capital. That is, at first net profits would increase as working capital increases. After working capital as related to sales increases above a certain level, it would depress profits.

Linear Regression Model

The effects on net profit of the above selected factors were estimated by the following linear regression model:

$$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{122}(X_{12})^2$$

1/ Other liabilities are defined as total liabilities (including long-term debt) less accounts payable.

where the variables

$\hat{Y}$ = net profit before income taxes in dollars and cents,

X_1 = volume of sales in dollars and cents,

X_2 = other income per $1,000 sales,

X_3 = gross margin per $1,000 sales,

X_4 = operating expenses per $1,000 sales,

X_5 = advertising expense per $1,000 sales,

X_6 = inventory turnover (cost of goods sold ÷ average inventory),

X_7 = sales per employee,

X_8 = total assets per $1,000 sales,

X_9 = accounts receivable per $1,000 sales,

X_{10} = accounts payable per $1,000 sales,

X_{11} = other liabilities per $1,000 sales,

X_{12} = net working capital per $1,000 sales;

and the estimated coefficients

b_0 = the intercept 1/,

b_1 = the effect on net profits of a one-unit change in volume of sales,

b_2 = the effect on net profits of a one-unit change in other income per $1,000 sales,

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1/ The intercept is a purely hypothetical number. Its sole purpose is to determine the proper level of net profits throughout the entire equation.

b_3 = the effect on net profits of a one-unit change in gross margin per $1,000 sales,

b_4 = the effect on net profits of a one-unit change in operating expenses per $1,000 sales,

b_5 = the effect on net profits of a one-unit change in amount spent for advertising per $1,000 sales,

b_6 = the effect on net profits of a one-unit change in inventory turnover,

b_7 = the effect on net profits of a one-unit change in amount of sales per employee,

b_8 = the effect on net profits of a one-unit change in total assets per $1,000 sales,

b_9 = the effect on net profits of a one-unit change in accounts receivable per $1,000 sales,

b_{10} = the effect on net profits of a one-unit change in accounts payable per $1,000 sales,

b_{11} = the effect on net profits of a one-unit change in other liabilities per $1,000 sales,

$b_{12} + b_{122}$ 1/ = the effect on net profits of a one-unit change in net working capital per $1,000 sales.

Other statistics obtained in conjunction with the above estimates were: (1) the multiple correlation coefficient (R^2), (2) a test of

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1/ The addition of $b_{12}(X_{12}) + b_{122}(X_{12})^2$ results in a curvilinear effect of X_{12} on net profits.

significance for the partial regression coefficients, and (3) the standard error of estimate of the partial regression coefficients.

Results of Analysis

The multiple correlation coefficient (R^2) expresses the percentage of the total variability explained by the regression equation. The multiple correlation coefficient for the linear regression model was significant at the 99 percent level of probability (Table 54). The regression equation explained 83.68 percent of the variation in net profits.

Table 54. Analysis of Variance for Regression Analysis, Based on Data Obtained from 62 Retail Farm Equipment Businesses, Virginia, 1960

Source of variation	Degrees of freedom	Sum of squares (Billion)	Mean square (Billion)	F ratio
Due to regression	13	97,992	7,538	18.94**
Error	48	19,118	398	
Total	61	117,110		

$R^2 = .8368$

** Significant at 99 percent level of probability.

The partial regression coefficients for the linear regression equation are given in Table 56. The test of significance for the regression coefficients revealed that variables X_1 through X_4 were significant at the 99 percent level of probability, and that variable X_5 was significant at the 95 percent level of probability. The remaining variables--X_6 through $(X_{12})^2$--were non-significant.

Table 55. Partial Regression Coefficients Computed from Data Obtained from 62 Retail Farm Equipment Businesses, Virginia, 1960

Variable	Description	Regression coefficient	Standard error of estimate	F ratio
X_1	Volume of Sales	0.047	0.008	31.090**
X_2	Other income ∕	174.709	58.405	8.948**
X_3	Gross margin ∕	234.809	22.509	108.823**
X_4	Operating expenses ∕	-176.932	29.341	36.364**
X_5	Advertising ∕	-798.868	342.032	5.455*
X_6	Inventory turnover	-959.852	606.141	2.508
X_7	Sales per employee	0.089	0.165	0.289
X_8	Total assets ∕	5.809	7.052	0.678
X_9	Accounts receivable ∕	-10.313	15.928	0.419
X_{10}	Accounts payable ∕	-1.719	10.835	0.025
X_{11}	Other liabilities ∕ 1/	-8.967	9.303	0.929
X_{12}	Net working capital ∕	-3,082.097	9,679.391	0.101
$(X_{12})^2$	Net working capital squared ∕	29.762	76.318	0.152
b_0	Point of origin 2/	-13,920.909	--	--

* Significant at 95 percent level of probability.
** Significant at 99 percent level of probability.
∕ Per $1,000 sales.
1/ Total liabilities including long-term debt less accounts payable.
2/ Expressed in dollars and cents.

Deletion

After completing a regression analysis, the researcher may wish to delete one (or more) factor(s) that was not as important as originally believed; or he may discover that the analysis as completed does not sufficiently explain the variation in the dependent variable, or may want to add other variables. Since the regression coefficients for several factors were non-significant, certain variables were deleted from the regression equation.

Effect of Deletion on Multiple Correlation Coefficient and Partial Regression Coefficients

After deleting variables X_7 through $(X_{12})^2$, the regression equation was reduced to

$$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$$

where the X's have the same meaning as previously indicated in the original regression equation.

The multiple correlation coefficient was not appreciably affected by the deletion of the selected variables. Before deletion, the regression equation explained 83.68 percent of the variation in net profits; after deletion, it explained 82.64 percent (Table 56).

The partial regression coefficients for variables X_1, X_2, and X_4 increased by a small amount; X_3 decreased by a small amount; and X_5 and X_6 increased substantially (Table 57). The variable X_5 was now significant at the 99 percent level of probability, and X_6 was significant at the 95 percent level of probability.

Table 56. Analysis of Variance for Regression Analysis after Deleting Selected Variables

Source of variation	Degrees of freedom	Sum of squares (Billion)	Mean square (Billion)	F ratio
Due to regression	6	96,778	16,129	43.59**
Error	55	20,332	370	
Total	61	117,110		

R^2 = .8264

** Significant at 99 percent level of probability.

Table 57. Partial Regression Coefficients after Deleting Variables X_7 through $(X_{12})^2$, Computed from Data Obtained from 62 Retail Farm Equipment Businesses, Virginia, 1960

Variable	Description	Regression coefficient	Standard error of estimate	F ratio
X_1	Volume of sales	0.048	0.007	48.448**
X_2	Other income ≠	179.119	53.342	11.276**
X_3	Gross margin ≠	234.585	20.824	126.905**
X_4	Operating expenses ≠	-178.113	23.238	58.750**
X_5	Advertising ≠	-859.021	286.394	8.997**
X_6	Inventory turnover	-1,052.710	459.542	5.248*
b_0	Point of origin 1/	-10,508.317	--	--

* Significant at 95 percent level of probability.
** Significant at 99 percent level of probability.
≠ Per $1,000 sales.
1/ Expressed in dollars and cents.

Interpretation of Partial Regression Coefficients

The interpretation of the partial regression coefficients, as presented below, relates to the equation:

$$\hat{Y} = -10,508.317 + 0.048X_1 + 179.119X_2 + 234.585X_3 - 178.113X_4 - 859.021X_5 - 1,052.710X_6.$$

The coefficients are a mathematical estimate of the effect of one particular factor on net profits if all other factors are held constant at the average. The partial regression coefficients are interpreted as follows:

(a) For each $1 increase in volume of sales, net profit increased by about $0.05;

(b) An addition of other income in the amount of $1 per $1,000 sales increased net profit by $179.12;

(c) An increase in gross margin of $1 per $1,000 sales resulted in an increase in net profit in the amount of $234.58;

(d) An increase in operating expenses of $1 per $1,000 sales caused net profit to decrease by $178.11;

(e) For an increase in advertising cost of $1 per $1,000 sales, net profits decreased by $859.02; and

(f) A one-unit increase in inventory turnover was accompanied by a $1,052.71 decrease in net profit.

The regression analysis did not support the hypothesis that net profits and advertising are directly correlated. However, the negative partial regression coefficient can be explained when it is considered

that volume of sales remains constant with an increase in advertising cost. Without an increase in volume of sales, net profit should be expected to decrease with an increase in an operating expense. Thus, as used in the regression equation, the variable of advertising cost did not correctly measure the effect advertising has on net profits. The effect of advertising on volume of sales would have to be known before the effect of advertising on net profit could be determined.

The negative partial regression coefficient obtained for inventory turnover should invoke some lively discussion since it is seemingly contradictory to theory.

The following discussion suggests several possible explanations for the negative value. They are offered with the hope that they might generate some interest in this area. It is recognized that none of the explanations are completely irrefutable.

Due to the nature of the retail farm equipment industry, it is possible for a business to maintain a large stock of machinery and equipment without its ever becoming a part of the business' investment. This situation occurs since dealers have the option of returning items to their respective manufacturers if they are not sold within a specified time period. This practice proves profitable to dealers in that it allows them to maintain a large stock of goods at a relatively low capital investment. This larger inventory makes possible a larger selection of items which may increase sales.

Another point to be made is that including such equipment as a part of inventory by some dealers results in heterogeneous data. Some dealers

consider the equipment held on the manufacturer's floor plan as a contingent liability. Thus, it does not become a part of inventory records, provided it is sold within a given time period. Other dealers include such equipment as part of their inventory before it is sold. The effect this has on inventory turnover can readily be seen. The dealers who include this equipment as part of their inventory will have a lower inventory turnover. It is possible that inventory turnover was not accurately reflected in the regression analysis.

Records available for most firms showed only the beginning and ending inventories. Therefore, the figures as included in the model did not reflect seasonality of inventory and may not have accurately measured average inventory. Also, the businesses from which records were obtained were located throughout the State. It is possible that some dealerships may have been at a period of high inventory, while others were at a period of low inventory.

Another factor which should be mentioned is that the regression coefficient was not significant at the 99 percent level of probability. Also, the standard error was so great that the coefficient has little meaning.

Thus, it is recommended that research of a more refined nature should be conducted within this general area. Perhaps a more refined model based on more homogeneous data will be more productive in this area.

SUMMARY AND IMPLICATIONS

Summary

Two-thirds of 210 franchised dealerships had annual sales of less than $200,000. Approximately one-half of these businesses were corporations, one-fourth were partnerships, and about one-fifth were single proprietorships. Only one dealership was organized as a cooperative. A large number of present businesses entered the farm equipment industry during the period 1947-51. The time of entry and number of years operated under the present management were closely associated. The farm machinery businesses attempt to obtain diversification by selling allied lines and other miscellaneous merchandise.

Of this sample, the average farm equipment business sold $259,758.03 of machinery and equipment. The margin obtained was 17.37 percent of sales; operating expenses were 16.30 percent of sales. After adding other income of $4,933.60, the average firm showed a net profit of $7,720.79, or 2.97 percent of sales. Total assets per firm were $143,764.24. Of this amount, $66,676.90 were liabilities and $77,087.34 was owner's equity. Returns to management averaged $3,866.42; the percent return on net worth was about 10 percent. The financial and operating condition of the businesses varied considerably. The average firm employed 9.24 persons.

The analysis of the financial statements by sales groups showed that net profits increased with an increase in size of business. As a percent of sales, relatively small variation existed among sales groups for gross

margin. In absolute amount, operating expenses increased with an increase in sales; but, as a percent of sales, operating expenses decreased as sales increased. The amount of other income increased as sales increased.

Analysis of gross margin by departments revealed that sales of new equipment were greater than those of other departments. As a percent of sales, the largest margin was obtained on parts. The used equipment department showed a loss for all sales groups. With the exception of new equipment, the gross margins varied considerably between departments and among sales groups.

Statistically significant differences existed among sales groups for the items of volume of sales, gross margin, operating expenses, net profits, total assets, total liabilities, net worth, and sales per employee. However, in some instances, the variation within sales groups was so great that comparisons of sales groups could not be made. Significant differences for inventory turnover did not exist among sales groups. The range revealed that wide differences existed among firms within sales groups for operating expenses, net profits, and other selected items. For many items, the coefficient of variation greatly exceeded 30 percent. It was also evident that for some factors, the median was a more representative measure than was the arithmetic mean.

Regression analysis showed that volume of sales, other income, gross margin, operating expenses, advertising and inventory turnover were statistically significant in explaining the variation in net profits. The multiple correlation coefficient, (R^2), was 0.8264. An

inverse relationship existed between net profits and inventory turnover. Several factors that might have contributed to the seemingly illogical result were examined.

Implications

The results of this study indicate that opportunities for considerable savings do exist within many Virginia retail farm equipment businesses. The wide variations in net profits for firms with similar sales imply that some firms are considerably more efficient in resource use than are other firms. Resource reallocation within the more inefficient firms should increase their profitability by a substantial amount.

The results further imply that it is possible for firms with small sales volume to realize substantial earnings. This should encourage firms of all sizes to strive for increased intra-firm efficiency.

The absence of detailed records by departments seems to indicate that many firm managers fail to realize the importance of keeping such records. There seemed to be a general lack of knowledge among firm managers as to how these records can be used in making management decisions.

Firm managers should be encouraged to adopt a more uniform system of record keeping. The seemingly contradictory result obtained for inventory turnover reflects the need for more homogeneous records. Research would be greatly enhanced by records of costs and expenses by departments.

Based on the results of this study, it is concluded that more detailed research of particular segments of these businesses would be of great benefit to Virginia's retail farm equipment industry. A study designed to determine the specific cause of the inverse relationship between net profits and inventory turnover could be of particular importance.

A more detailed analysis of trade-in practices and over-allowances as they affect the pricing of new equipment could be of special significance. Studies of specific areas of expense or of departments would reflect more accurately areas of inefficiencies. Studies designed to explain the causes of inefficiencies would be invaluable to Virginia's farm equipment dealers.

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VITA

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Attended elementary school in Lee County and graduated from Flatwoods High School in 1956.

Entered Union College, Barbourville, Kentucky, in 1956. Entered Virginia Polytechnic Institute in 1958. Graduated in June, 1960, with a Bachelor of Science Degree in Agricultural Economics.

Entered the graduate school in Agricultural Economics at Virginia Polytechnic Institute in September, 1960.

Blacksburg, Virginia, May, 1962

Max Rolfe Glass

Max Rolfe Glass

APPENDIX A

Sample Survey Schedules

MAIL QUESTIONNAIRE

Confidential Information

Code Number _____

1. Brand names of farm machinery and equipment handled:
   Tractor_____
   Field equipment_____
   Dairy equipment_____
   Orchard equipment_____
   Other (specify)_____

2. Location of branch outlets (if any)_____, _____, _____, _____.

3. When does your fiscal year end? _____.

4. How often do you take an inventory of your farm machinery and equipment? Monthly____, Bi-monthly____, Quarterly____, Semi-annually____, Annually____.

5. When was your firm organized? _____. How long has it been operated under the present management? _____ years.

6. Is your business a:
   Single proprietorship____ Corporation____
   Partnership____ Cooperative____

7. What percent of your farm machinery and equipment business comes from the following: ____% New equipment, ____% Used equipment, ____% Service labor, ____% Parts, ____% Light industrial equipment, ____% Equipment leasing.

8. Which of the following are sold in conjunction with your farm machinery and equipment business? Feed and seed____, Fertilizer____, Garden and lawn equipment____, Hardware____, Gas and oil____, Other (specify) _____, _____, _____.

9. Do you have your farm machinery and equipment costs broken down by departments? Yes___ No___.

MAIL QUESTIONNAIRE (Cont.)

10. Was your volume of farm machinery and equipment sales for the last fiscal year:
Under $100,000____,
100,000 - 200,000____,
200,000 - 300,000____,
300,000 - 400,000____,
400,000 - 500,000____,
500,000 - 1,000,000____,
Over 1,000,000____.

11. If your firm is selected in our sample, will you provide more detailed information? Yes____ No____

Report Prepared by:

_____
Name

_____
Title

BALANCE SHEET SCHEDULE

Confidential Code Number _____

Balance Sheet

_____ ___, 19___

ASSETS

Current Assets:

Cash..... $_____

Marketable Securities..... _____

Accounts Receivable..... _____

Notes Receivable..... _____

Inventories (at cost):

New Equipment..... $_____

Used Equipment.... _____

Parts..... _____

Other (specify)... _____

_____ _____

Total Current Assets - - - - - - - - - - - - - - - - $_____

Fixed Assets:

Land..... $_____

Buildings..... _____

Shop Equipment and Tools..... _____

Cars, Trucks, Trailers, etc..... _____

Office Equipment and Furniture..... _____

BALANCE SHEET SCHEDULE (Cont.)

Code Number _____

Other (specify)..... _____

_____

Total Fixed Assets - - - - - - - - - - - - - - - - - - $_____

Other Assets:

Deferred Charges

and Prepaid Expenses:

Insurance..... $_____

Taxes, Licenses... _____

Interest..... _____

Rent..... _____

Other (specify)... _____

_____ _____

Total Other Assets - - - - - - - - - - - - - - - - - - $_____

Total Assets - $_____

LIABILITIES AND NET WORTH

Current Liabilities:

Accounts Payable:

Trade..... $_____

Other..... _____ $_____

BALANCE SHEET SCHEDULE (Cont.)

Code Number _____

Notes Payable:

Trade..... $_____

Banks..... _____ $_____

Accrued Liabilities:

Wages..... $_____

Interest..... _____

Taxes..... _____

Social Security... _____

Other (specify)..... _____

_____ _____

_____ _____ _____

Total Current Liabilities - - - - - - - - - - - - - - - $_____

Long-Term Debt:

Notes and Mortgages Payable:

To Persons..... $_____

To Banks..... _____

To Insurance Cos.. _____

To Other..... _____ $_____

Bonds Payable..... _____

Other (specify):

_____ _____

_____ _____ _____

BALANCE SHEET SCHEDULE (Cont.)

Code Number _____

Total Long-Term Debt - - - - - - - - - - - - - - - - - - $_____

Total Liabilities - - - - - - - - - - - - - - - - - - $_____

Net Worth:

Capital Stock:

Preferred..... $_____

Common..... _____ $_____

Surplus:

Retained Earnings. _____ _____

Other (specify)... _____

Total Net Worth - $_____

Total Liabilities and Net Worth - - - - - - - - - $_____

STATEMENT OF PROFIT AND LOSS SCHEDULE

Confidential Code Number _____

STATEMENT OF PROFIT AND LOSS

FOR THE FISCAL YEAR ENDED _____ ___, 1960

	Amount	% of Sales
Sales.....	$_____	_____
Cost of Goods Sold:		
Inventory, _____ ___, 1959.....	$_____	_____
Purchases.....	_____	_____
Freight and Express.....	_____	_____
Inventory, _____ ___, 1960.....	$_____	_____
Cost of Goods Sold.....	$_____	_____
Gross Profit - - - - - - - - - - -	$_____	_____
Expenses:		
Salaries:		
Owners, Officers.. $_____		_____
Salesmen..... _____		_____
Partsmen..... _____		_____
Shop Labor..... _____		_____
Office Employees.. _____		_____
Other..... _____	$_____	_____
Depreciation:		
Building Depr. or Rent.... $_____		_____
Shop Equipment.... _____		_____

STATEMENT OF PROFIT AND LOSS SCHEDULE (Cont.)

Code Number _____

	Amount	% of Sales
Cars and Trucks.... _____		_____
Office Furn. & Equip_____		_____
Other..... _____	$_____	_____
Sales Promotion and Demonstration.....	_____	_____
Advertising.....	_____	_____
After Sale Expense.....	_____	_____
Auto and Truck Expense.....	_____	_____
Taxes:		
So. Sec. - FOAB... $_____		_____
So. Sec. - Unemp.. _____		_____
Real Estate and		
Business Taxes..... _____		_____
Licenses..... _____		_____
Other..... _____	$_____	_____
Insurance:		
Fire and Casualty. $_____		_____
Group Insurance... _____	$_____	_____
Shop Expense, Tools and Supplies.....	_____	_____
Telephone and Telegraph.....	_____	_____
Heat, Electricity, and Water.....	_____	_____
Professional Services.....	_____	_____
Office Expenses, Stationery, Printing.	_____	_____

STATEMENT OF PROFIT AND LOSS SCHEDULE (Cont.)

Code Number _____

	Amount	% of Sales
Bad Debts.....	_____	_____
Interest:		
On Current Debts.. $_____		_____
On Mortgages..... _____	_____	_____
Dues and Subscriptions.....	_____	_____
Postage.....	_____	_____
Travel and Entertainment.....	_____	_____
Repairs:		
Shop Equipment.... $_____		_____
Bldg. & Fixtures.. _____		_____
Office Equip. & Furn._____		_____
Cars and Trucks.... _____		_____
Other..... _____	$_____	_____
Amortization of Organ. Ex.....	_____	_____
Miscellaneous Expense.....	_____	_____
Total Expenses - - - - - - - - - -	$_____	_____
Profit from Operations - - - - - -	$_____	_____

Other Income:

Interest Earned..... $_____		_____
Cash Discounts Earned. _____		_____

STATEMENT OF PROFIT AND LOSS SCHEDULE (Cont.)

Code Number _____

		Amount	% of Sales
Other (specify):			
_____	_____		_____
_____	_____		_____
_____	_____	$_____	_____
Profit before Income Taxes - - - -		$_____	_____
Income Taxes:			
State.....	$_____		_____
Federal.....	_____	$_____	_____
Net Profit for the Year - - - - - -		$_____	_____

Enumerator 1, 2, 3

GROSS MARGINS BY DEPARTMENT AND LABOR SCHEDULES

Code Number _____

Gross Margins by Department

Department	Sales	Cost of Goods Sold	Gross Margin	% of Sales
New Equipment				
Used Equipment				
Parts				
Service				
Miscellaneous				
Total				

Labor

(Man Year Equivalents)

	Number
Salesmen	
Office Workers	
Officers, Owners, and/or Managers	
Partsmen	
Shop Labor	
Deliverymen	
Janitors	
Other (specify)	
Total Number of Employees	

APPENDIX B

Financial Statement Characteristics

Table I. Selected Characteristics of Volume of Sales of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$24,394.21	$102,045.57	$201,570.21	$301,185.16	$403,834.55
High	98,545.40	199,755.46	291,272.02	387,204.80	697,752.58
Mean	73,038.24	149,085.16	236,943.40	343,278.88	509,008.92
Median	78,941.97	153,377.82	234,908.58	344,957.90	505,255.93
Standard deviation	25,034.21	31,889.44	25,723.71	26,443.15	96,718.41
Coef. of variation	34.28%	21.39%	10.86%	7.70%	19.00%

Table II. Selected Characteristics of Gross Margin of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$ 5,512.69	$16,618.33	$24,309.98	$27,355.44	$ 58,186.48
High	24,394.38	46,152.93	79,577.28	84,519.65	190,492.13
Mean	13,794.81	26,018.92	39,799.89	57,561.76	92,905.41
Median	12,151.61	23,652.54	35,851.19	56,329.71	79,190.24
Standard deviation	6,005.72	8,756.98	15,511.91	14,693.78	41,580.94
Coef. of variation	43.54%	33.66%	38.97%	25.53%	44.76%

Table III. Selected Characteristics of Operating Expenses of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$ 7,489.96	$13,618.33	$23,142.91	$29,747.50	$ 53,289.32
High	18,004.06	51,304.34	57,819.57	79,596.06	137,516.47
Mean	13,589.79	27,042.88	38,533.65	55,023.66	78,520.94
Median	14,146.42	25,720.88	35,859.41	49,443.30	75,391.46
Standard deviation	3,184.94	9,370.68	12,767.29	15,966.06	24,533.97
Coef. of variation	23.44%	34.65%	33.13%	29.02%	31.25%

Table IV. Selected Characteristics of Other Income of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$ -0-	$ -0-	$ 90.77	$ -0-	$ 3,470.62
High	2,342.45	8,792.71	15,771.89	19,492.10	26,616.44
Mean	411.21	1,951.65	4,250.40	7,593.11	10,629.58
Median	-0-	648.82	3,082.67	10,543.98	7,763.81
Standard deviation	825.98	2,567.79	4,330.14	6,303.96	7,424.86
Coef. of variation	200.87%	131.57%	101.88%	83.02%	69.85%

Table V. Selected Characteristics of Profit before Income Taxes of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	($5,009.47)*	($ 7,214.50)*	($16,503.01)*	($ 9,439.05)*	$ 3,313.57
High	7,174.43	10,708.58	33,403.56	25,151.11	63,781.19
Mean	616.24	927.69	5,516.64	10,131.21	25,014.04
Median	(1,562.10)*	522.48	4,025.46	9,342.25	17,453.38
Standard deviation	--	--	--	--	--
Coef. of variation 1/	--	--	--	--	--

* Negative figure.

1/ Standard deviation and coefficient of variation are invalid for data which contain negative figures.

Table VI. Selected Characteristics of Total Assets of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$ 27,451.22	$ 43,765.57	$ 63,604.36	$ 83,274.55	$113,592.03
High	123,946.04	259,990.55	234,998.79	253,450.79	565,065.84
Mean	60,952.37	91,233.04	133,250.30	179,419.89	263,023.92
Median	43,863.47	67,386.25	123,458.61	188,662.65	174,207.34
Standard deviation	36,810.45	57,857.66	51,948.77	54,111.86	167,604.60
Coef. of variation	60.39%	63.42%	38.99%	30.16%	63.72%

Table VII. Selected Characteristics of Total Liabilities of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$ 3,120.48	$ 1,395.65	$ 18,137.39	$ 86.00	$ 39,801.45
High	28,528.04	191,611.65	141,744.75	204,214.11	278,110.65
Mean	15,750.62	51,900.00	62,528.04	86,571.03	110,330.76
Median	16,634.07	38,661.54	62,366.27	89,190.27	96,795.69
Standard deviation	9,260.40	49,025.87	35,760.07	60,749.35	72,867.79
Coef. of variation	58.79%	94.46%	57.19%	70.17%	66.04%

Table VIII. Selected Characteristics of Net Worth of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$12,382.00	$ 3,373.73	$ 13,080.21	$ 2,124.28	$ 43,549.01
High	95,418.00	101,243.15	197,601.40	214,444.67	356,302.60
Mean	45,201.75	39,333.04	70,722.26	92,848.86	152,693.16
Median	34,387.89	34,706.87	41,132.54	92,736.86	81,371.82
Standard deviation	33,612.28	24,826.36	57,924.12	56,266.94	114,532.82
Coef. of variation	74.36%	63.12%	81.90%	60.60%	75.01%

Table IX. Selected Characteristics of Sales per Employee of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	$ 8,131.40	$14,972.71	$17,609.78	$20,721.42	$25,352.68
High	28,405.90	38,344.46	36,983.77	43,364.25	48,265.72
Mean	16,222.81	26,060.57	28,742.35	28,819.10	36,784.77
Median	15,173.16	27,805.78	29,363.57	27,755.81	39,286.06
Standard deviation	6,167.14	6,687.66	5,156.02	6,154.63	9,299.66
Coef. of variation	38.02%	25.66%	17.94%	21.36%	25.28%

Table X. Selected Characteristics of Inventory Turnover of 62 Retail Farm Equipment Businesses, by Sales Groups, Virginia, 1960

Characteristic	Sales group A	B	C	D	E
Number of firms	8	15	15	15	9
Range:					
Low	0.90	0.63	1.50	1.48	2.47
High	4.93	5.06	8.31	10.53	0.22
Mean	2.23	2.85	2.80	3.69	4.08
Median	1.92	2.68	2.63	2.66	2.80
Standard deviation	1.31	1.12	1.65	2.62	1.99
Coef. of variation	58.74%	39.30%	58.93%	71.00%	48.77%

APPENDIX C

Profit Group Financial Statements

Table I. Total Assets of Sales Group A, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group A average
Number of firms	4	4	8
Cash and marketable securities	$ 2,251.40	$12,419.66	$ 7,335.53
Accounts receivable	4,923.18	16,723.26	10,823.22
Notes receivable	188.75	9,545.24	4,867.00
Other current assets	-0-	-0-	-0-
Inventory	33,180.88	24,423.59	28,802.23
Total current assets	$40,544.21	$63,111.75	$51,827.98
Fixed assets	15,657.98	2,560.54	9,109.26
Other assets	30.26	-0-	15.13
Total assets	$56,232.45	$65,672.29	$60,952.37
	Percent of total assets		
Cash and marketable securities	4.01	18.92	12.04
Accounts receivable	8.77	25.46	17.76
Notes receivable	0.30	14.53	7.98
Other current assets	-0-	-0-	-0-
Inventory	59.02	37.19	47.25
Total current assets	72.10	96.10	85.03
Fixed assets	27.85	3.90	14.94
Other assets	0.05	-0-	0.03
Total assets	100.00	100.00	100.00

Table II. Total Liabilities and Net Worth of Sales Group A, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group A average
Number of firms	4	4	8
Accounts payable	$12,117.44	$ 5,089.44	$ 8,603.44
Notes payable	8,701.19	4,188.95	6,445.07
Accrued liabilities	559.33	844.89	702.11
Total current liabilities	$21,377.96	$10,123.28	$15,750.62
Long-term liabilities	-0-	-0-	-0-
Total liabilities	$21,377.96	$10,123.28	$15,750.62
Net worth	34,854.49	55,549.02	45,201.75
Total liabilities and net worth	$56,232.45	$65,672.30	$60,952.37
	Percent of total assets		
Accounts payable	21.56	7.75	14.12
Notes payable	15.47	6.38	10.57
Accrued liabilities	0.99	1.29	1.15
Total current liabilities	38.02	15.42	25.84
Long-term liabilities	-0-	-0-	-0-
Total liabilities	38.02	15.42	25.84
Net worth	61.98	84.58	74.16
Total liabilities and net worth	100.00	100.00	100.00

Table III. Statement of Profit and Loss of Sales Group A, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group A average
Number of firms	4	4	8
SALES	$59,772.49	$86,303.99	$73,038.24
COST OF GOODS SOLD	49,947.09	68,539.76	59,243.42
GROSS MARGIN	9,825.40	17,764.23	13,794.82
EXPENSES:			
Salaries	6,777.31	7,995.92	7,386.61
Advertising and sales promotion	120.66	325.54	223.10
After sale expense	87.55	207.47	147.50
Depreciation and rent	2,212.65	1,153.55	1,683.10
Auto and truck expense	328.76	730.52	529.64
Taxes and licenses	674.95	840.88	739.95
Insurance	360.99	459.06	410.02
Shop expense	502.99	44.65	273.82
Telephone and telegraph	199.13	182.36	190.74
Heat, lights, water	427.17	750.13	588.65
Professional services	84.94	208.19	146.56
Office expense	33.56	74.30	53.93
Bad debts	256.25	173.19	214.72
Interest	331.97	145.73	238.85
Dues and subscriptions	3.75	19.88	11.81
Postage	41.81	15.50	28.65
Travel and entertainment	28.59	320.51	174.55
Repairs	291.50	-0-	145.75
Miscellaneous expense	26.16	777.53	401.84
TOTAL EXPENSES	12,790.67	14,388.91	13,589.79
PROFIT FROM OPERATIONS	(2,965.27)*	3,375.32	205.03
OTHER INCOME	40.78	781.64	411.21
PROFIT BEFORE INCOME TAXES	(2,924.49)*	4,156.96	616.24

* Negative figure.

Table IV. Statement of Profit and Loss as a Percent of Sales of Sales Group A, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group A average
Number of firms	4	4	8
	Percent of sales		
SALES	100.00	100.00	100.00
COST OF GOODS SOLD	83.56	79.42	81.11
GROSS MARGIN	16.44	20.58	18.89
EXPENSES:			
Salaries	11.34	9.26	10.11
Advertising and sales promotion	0.20	0.38	0.32
After sale expense	0.15	0.24	0.20
Depreciation and rent	3.70	1.34	2.30
Auto and truck expense	0.55	0.85	0.73
Taxes and licenses	1.13	0.93	1.01
Insurance	0.60	0.53	0.56
Shop expense	0.84	0.05	0.37
Telephone and telegraph	0.33	0.21	0.26
Heat, lights, water	0.71	0.87	0.81
Professional services	0.14	0.24	0.20
Office expense	0.06	0.09	0.07
Bad debts	0.43	0.20	0.29
Interest	0.56	0.17	0.33
Dues and subscriptions	0.01	0.02	0.02
Postage	0.07	0.02	0.04
Travel and entertainment	0.05	0.37	0.24
Repairs	0.49	0.00	0.20
Miscellaneous expense	0.04	0.90	0.55
TOTAL EXPENSES	21.40	16.67	18.61
PROFIT FROM OPERATIONS	(4.96)*	3.91	0.28
OTHER INCOME	0.07	0.91	0.56
PROFIT BEFORE INCOME TAXES	(4.89)*	4.82	0.84

* Negative figure.

Table V. Total Assets of Sales Group B, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group B average
Number of firms	7	8	15
Cash and marketable securities	$ 9,509.13	$ 1,178.53	$ 5,066.14
Accounts receivable	10,953.85	11,162.03	11,064.88
Notes receivable	1,177.00	5,992.36	3,745.19
Other current assets	310.72	106.95	202.04
Inventory	42,782.05	63,776.63	53,979.16
Total current assets	$64,732.75	$ 82,216.50	$74,057.41
Fixed assets	12,827.74	18,152.23	15,667.47
Other assets	1,706.76	1,334.38	1,508.16
Total assets	$79,267.25	$101,703.11	$91,233.04
	Percent of total assets		
Cash and marketable securities	12.00	1.15	5.55
Accounts receivable	13.82	10.98	12.13
Notes receivable	1.48	5.89	4.11
Other current assets	0.39	0.11	0.22
Inventory	53.97	62.71	59.17
Total current assets	81.66	80.84	81.18
Fixed assets	16.18	17.85	17.17
Other assets	2.16	1.31	1.65
Total assets	100.00	100.00	100.00

Table VI. Total Liabilities and Net Worth of Sales Group B, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group B average
Number of firms	7	8	15
Accounts payable	$ 2,490.05	$ 21,631.32	$12,698.72
Notes payable	20,405.13	38,377.04	29,990.15
Accrued liabilities	1,007.55	3,301.56	2,231.03
Total current liabilities	$23,902.73	$ 63,309.92	$44,919.90
Long-term liabilities	10,139.51	4,215.63	6,980.10
Total liabilities	$34,042.54	$ 67,525.55	$51,900.00
Net worth	45,225.02	34,177.56	39,333.04
Total liabilities and net worth	$79,267.26	$101,703.11	$91,233.04
	Percent of total assets		
Accounts payable	3.15	21.26	13.92
Notes payable	25.74	37.73	32.87
Accrued liabilities	1.27	3.25	2.45
Total current liabilities	30.15	62.25	49.24
Long-term liabilities	12.79	4.15	7.65
Total liabilities	42.95	66.39	56.89
Net worth	57.05	33.61	43.11
Total liabilities and net worth	100.00	100.00	100.00

Table VII. Statement of Profit and Loss of Sales Group B, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group B average
Number of firms	7	8	15
SALES	$146,518.70	$151,330.82	$149,085.16
COST OF GOODS SOLD	126,440.82	120,113.49	123,066.24
GROSS MARGIN	20,077.88	31,217.33	26,018.92
EXPENSES:			
Salaries	12,502.62	11,961.19	12,213.86
Advertising and sales promotion	1,207.46	1,030.48	1,113.07
After sale expense	1,761.43	1,893.42	1,831.81
Depreciation and rent	2,043.51	1,818.21	1,923.35
Auto and truck expense	734.75	1,513.67	1,150.17
Taxes and licenses	1,538.48	1,518.02	1,527.57
Insurance	931.73	986.46	960.92
Shop expense	672.09	982.28	837.53
Telephone and telegraph	434.93	607.35	526.89
Heat, lights, water	587.43	440.32	508.98
Professional services	300.45	521.58	418.39
Office expense	231.06	247.69	239.93
Bad debts	948.77	673.90	802.17
Interest	776.56	2,055.65	1,458.74
Dues and subscriptions	415.76	47.44	219.32
Postage	19.34	30.77	25.43
Travel and entertainment	101.29	289.30	201.56
Repairs	594.79	550.31	571.07
Miscellaneous expense	277.27	717.61	512.13
TOTAL EXPENSES	26,079.72	27,885.65	27,042.88
PROFIT FROM OPERATIONS	(6,001.84)*	3,331.68	(1,023.96)*
OTHER INCOME	2,338.51	1,613.15	1,951.65
PROFIT BEFORE INCOME TAXES	(3,663.33)*	4,944.83	927.69

* Negative figure.

Table VIII. Statement of Profit and Loss as a Percent of Sales, for Sales Group B, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group B average
Number of firms	7	8	15
	Percent of sales		
SALES	100.00	100.00	100.00
COST OF GOODS SOLD	86.30	79.37	82.55
GROSS MARGIN	13.70	20.63	17.45
EXPENSES:			
Salaries	8.53	7.90	8.19
Advertising and sales promotion	0.82	0.68	0.75
After sale expense	1.21	1.26	1.23
Depreciation and rent	1.39	1.21	1.29
Auto and truck expense	0.50	1.00	0.77
Taxes and licenses	1.05	1.00	1.02
Insurance	0.63	0.65	0.64
Shop expense	0.46	0.65	0.56
Telephone and telegraph	0.30	0.40	0.35
Heat, lights, water	0.40	0.29	0.34
Professional services	0.21	0.34	0.28
Office expense	0.16	0.16	0.16
Bad debts	0.65	0.45	0.54
Interest	0.53	1.36	0.98
Dues and subscriptions	0.28	0.03	0.15
Postage	0.01	0.02	0.02
Travel and entertainment	0.07	0.19	0.14
Repairs	0.41	0.36	0.38
Miscellaneous expense	0.19	0.47	0.34
TOTAL EXPENSES	17.80	18.43	18.13
PROFIT FROM OPERATIONS	(4.10)*	2.20	(0.68)*
OTHER INCOME	1.60	1.07	1.31
PROFIT BEFORE INCOME TAXES	(2.50)*	3.27	0.63

* Negative figure.

Table IX. Total Assets of Sales Group C, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	Profit group: High profit	Profit group: Group C average
Number of firms	7	8	15
Cash and marketable securities	$ 1,302.65	$ 10,840.71	$ 6,389.61
Accounts receivable	13,536.17	11,644.22	12,527.13
Notes receivable	1,025.98	10,569.26	6,115.73
Other current assets	229.29	2,359.13	1,365.21
Inventory	95,768.69	65,673.18	79,717.75
Total current assets	$111,862.78	$101,086.50	$106,115.43
Fixed assets	18,136.55	29,381.86	24,134.05
Other assets	3,020.13	2,983.93	3,000.82
Total assets	$133,019.46	$133,452.29	$133,250.30
	Percent of total assets		
Cash and marketable securities	0.98	8.11	4.80
Accounts receivable	10.18	8.73	9.40
Notes receivable	0.77	7.92	4.59
Other current assets	0.17	1.77	1.02
Inventory	72.00	49.21	59.83
Total current assets	84.10	75.74	79.64
Fixed assets	13.63	22.02	18.11
Other assets	2.27	2.24	2.25
Total assets	100.00	100.00	100.00

Table X. Total Liabilities and Net Worth of Sales Group C, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	Profit group: High profit	Group C average
Number of firms	7	8	15
Accounts payable	$ 25,724.52	$ 15,020.76	$ 20,015.85
Notes payable	40,420.41	26,537.54	33,016.22
Accrued liabilities	393.37	2,306.93	1,413.93
Total current liabilities	$ 66,538.30	$ 43,865.23	$ 54,446.00
Long-term liabilities	12,341.28	4,355.21	8,082.04
Total liabilities	$ 78,879.58	$ 48,220.44	$ 62,528.04
Net worth	54,139.88	85,231.85	70,722.26
Total liabilities and net worth	$133,019.46	$133,452.29	$133,250.30
	Percent of total assets		
Accounts payable	19.33	11.25	15.02
Notes payable	30.39	19.89	24.78
Accrued liabilities	0.30	1.73	1.06
Total current liabilities	50.02	32.87	40.86
Long-term liabilities	9.28	3.26	6.07
Total liabilities	59.30	36.13	46.93
Net worth	40.70	63.87	53.07
Total liabilities and net worth	100.00	100.00	100.00

Table XI. Statement of Profit and Loss of Sales Group C, by Profit Groups, Virginia, 1960

Item	Profit group		
	Low profit	High profit	Group C average
Number of firms	7	8	15
SALES	$235,409.74	$238,285.35	$236,943.40
COST OF GOODS SOLD	201,752.06	193,111.02	197,143.51
GROSS MARGIN	33,657.68	45,174.33	39,799.89
EXPENSES:			
Salaries	15,716.05	17,057.28	16,431.37
Advertising and sales promotion	1,560.88	1,494.89	1,525.68
After sale expense	1,945.26	2,865.24	2,435.91
Depreciation and rent	3,739.73	4,174.52	3,971.62
Auto and truck expense	1,185.15	1,097.28	1,138.29
Taxes and licenses	2,730.28	2,246.80	2,472.42
Insurance	2,504.61	1,565.78	2,003.90
Shop expense	914.95	1,144.14	1,037.19
Telephone and telegraph	519.45	937.80	742.57
Heat, lights, water	1,313.72	871.31	1,077.77
Professional services	314.41	383.08	351.03
Office expense	282.58	333.85	309.92
Bad debts	91.75	419.81	266.73
Interest	1,349.03	624.82	962.78
Dues and subscriptions	68.26	82.33	75.76
Postage	506.23	106.05	292.80
Travel and entertainment	102.48	559.25	346.09
Repairs	532.27	1,392.13	990.86
Miscellaneous expense	2,327.73	1,902.53	2,100.96
TOTAL EXPENSES	37,704.82	39,258.89	38,533.65
PROFIT FROM OPERATIONS	(4,047.14)*	5,915.44	1,266.24
OTHER INCOME	2,184.99	6,057.65	4,250.40
PROFIT BEFORE INCOME TAXES	(1,862.15)*	11,973.09	5,516.64

* Negative figure.

Table XII. Statement of Profit and Loss as a Percent of Sales of Sales Group C, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group C average
Number of firms	7	8	15
	Percent of sales		
SALES	100.00	100.00	100.00
COST OF GOODS SOLD	85.70	81.04	83.20
GROSS MARGIN	14.30	18.96	16.80
EXPENSES:			
Salaries	6.68	7.16	6.93
Advertising and sales promotion	0.66	0.63	0.64
After sale expense	0.82	1.21	1.02
Depreciation and rent	1.59	1.76	1.68
Auto and truck expense	0.50	0.46	0.48
Taxes and licenses	1.16	0.94	1.04
Insurance	1.07	0.66	0.85
Shop expense	0.39	0.48	0.44
Telephone and telegraph	0.22	0.39	0.31
Heat, lights, water	0.56	0.37	0.45
Professional services	0.13	0.16	0.15
Office expense	0.12	0.14	0.13
Bad debts	0.04	0.18	0.11
Interest	0.57	0.26	0.42
Dues and subscriptions	0.03	0.03	0.03
Postage	0.22	0.04	0.12
Travel and entertainment	0.04	0.23	0.15
Repairs	0.23	0.58	0.42
Miscellaneous expense	0.99	0.80	0.89
TOTAL EXPENSES	16.02	16.48	16.26
PROFIT FROM OPERATIONS	(1.72)*	2.48	0.54
OTHER INCOME	0.93	2.54	1.79
PROFIT BEFORE INCOME TAXES	(0.79)*	5.02	2.33

* Negative figure.

Table XIII. Total Assets of Sales Group D, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group D average
Number of firms	7	8	15
Cash and marketable securities	$ 7,615.91	$ 13,362.10	$ 10,680.54
Accounts receivable	20,413.50	22,624.85	21,592.89
Notes receivable	7,089.16	9,802.87	8,536.47
Other current assets	200.19	1,026.24	640.75
Inventory	123,486.66	86,252.68	103,628.54
Total current assets	$158,805.42	$133,068.74	$145,079.19
Fixed assets	14,947.57	45,434.51	31,207.27
Other assets	1,439.32	4,615.76	3,133.43
Total assets	$175,192.31	$183,119.01	$179,419.89
	Percent of total assets		
Cash and marketable securities	4.35	7.30	5.95
Accounts receivable	11.65	12.36	12.03
Notes receivable	4.05	5.35	4.76
Other current assets	0.11	0.56	0.36
Inventory	70.49	47.10	57.76
Total current assets	90.65	72.67	80.86
Fixed assets	8.53	24.81	17.39
Other assets	0.82	2.52	1.75
Total assets	100.00	100.00	100.00

Table XIV. Total Liabilities and Net Worth of Sales Group D, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group D average
Number of firms	7	8	15
Accounts payable	$ 31,346.21	$ 14,282.03	$ 22,245.32
Notes payable	43,340.85	31,111.99	36,818.79
Accrued liabilities	1,703.96	2,772.61	2,273.90
Total current liabilities	$ 76,391.02	$ 48,166.63	$ 61,338.01
Long-term liabilities	43,376.53	9,357.44	25,233.02
Total liabilities	$119,767.55	$ 57,524.07	$ 86,571.03
Net worth	55,424.76	125,594.94	92,848.86
Total liabilities and net worth	$175,192.31	$183,119.01	$179,419.89
	Percent of total assets		
Accounts payable	17.89	7.80	12.40
Notes payable	24.74	16.99	20.52
Accrued liabilities	0.97	1.51	1.27
Total current liabilities	43.60	26.30	34.19
Long-term liabilities	24.76	5.11	14.06
Total liabilities	68.36	31.41	48.25
Net worth	31.64	68.59	51.75
Total liabilities and net worth	100.00	100.00	100.00

Table XV. Statement of Profit and Loss of Sales Group D, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group D average
Number of firms	7	8	15
SALES	$329,160.29	$355,632.65	$343,278.88
COST OF GOODS SOLD	273,313.49	296,570.31	285,717.12
GROSS MARGIN	55,846.80	59,062.34	57,561.76
EXPENSES:			
Salaries	28,158.77	23,782.82	25,824.93
Advertising and sales promotion	3,028.56	1,712.89	2,326.87
After sale expense	1,980.65	509.90	1,196.25
Depreciation and rent	6,527.49	4,746.84	5,577.81
Auto and truck expense	2,468.30	2,384.77	2,423.75
Taxes and licenses	2,826.48	3,479.83	3,174.94
Insurance	2,667.37	2,817.56	2,747.47
Shop expense	1,857.72	1,474.38	1,653.27
Telephone and telegraph	1,182.68	1,237.10	1,211.70
Heat, lights, water	947.35	1,378.91	1,177.52
Professional services	662.50	695.88	680.30
Office expense	247.96	414.96	337.03
Bad debts	849.14	1,487.32	1,189.50
Interest	2,496.22	988.99	1,692.36
Dues and subscriptions	170.45	355.79	269.30
Postage	477.05	148.18	301.65
Travel and entertainment	784.75	331.34	542.93
Repairs	1,265.69	895.95	1,068.49
Miscellaneous expense	1,868.88	1,416.44	1,627.58
TOTAL EXPENSES	60,468.01	50,259.85	55,023.66
PROFIT FROM OPERATIONS	(4,621.21)*	8,802.49	2,538.10
OTHER INCOME	6,082.95	8,914.49	7,593.11
PROFIT BEFORE INCOME TAXES	1,461.74	17,716.98	10,131.21

* Negative figure.

Table XVI. Statement of Profit and Loss as a Percent of Sales of Sales Group D, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group D average
Number of firms	7	8	15
	Percent of sales		
SALES	100.00	100.00	100.00
COST OF GOODS SOLD	83.03	83.39	83.23
GROSS MARGIN	16.97	16.61	16.77
EXPENSES:			
Salaries	8.55	6.69	7.52
Advertising and sales promotion	0.92	0.48	0.68
After sale expense	0.61	0.14	0.35
Depreciation and rent	1.98	1.33	1.62
Auto and truck expense	0.75	0.67	0.71
Taxes and licenses	0.86	0.98	0.92
Insurance	0.81	0.79	0.80
Shop expense	0.56	0.41	0.48
Telephone and telegraph	0.36	0.35	0.35
Heat, lights, water	0.29	0.39	0.34
Professional services	0.20	0.20	0.20
Office expense	0.08	0.12	0.11
Bad debts	0.26	0.42	0.35
Interest	0.76	0.28	0.49
Dues and subscriptions	0.05	0.10	0.08
Postage	0.14	0.04	0.09
Travel and entertainment	0.24	0.09	0.16
Repairs	0.38	0.25	0.31
Miscellaneous expense	0.57	0.40	0.47
TOTAL EXPENSES	18.37	14.13	16.03
PROFIT FROM OPERATIONS	(1.40)*	2.48	0.74
OTHER INCOME	1.85	2.50	2.21
PROFIT BEFORE INCOME TAXES	0.45	4.98	2.95

* Negative figure.

Table XVII. Total Assets of Sales Group E, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group E average
Number of firms	4	5	9
Cash and marketable securities	$ 15,169.59	$ 24,471.29	$ 20,337.20
Accounts receivable	33,438.92	37,002.40	35,418.63
Notes receivable	30,851.99	38,824.42	35,281.12
Other current assets	2,129.83	4,252.39	3,309.03
Inventory	99,126.50	144,710.45	124,450.92
Total current assets	$180,716.83	$249,260.95	$218,796.90
Fixed assets	17,224.02	61,104.14	41,601.86
Other assets	4,612.51	1,035.28	2,625.16
Total assets	$202,553.36	$311,400.37	$263,023.92
	Percent of total assets		
Cash and marketable securities	7.49	7.86	7.73
Accounts receivable	16.51	11.88	13.47
Notes receivable	15.23	12.47	13.41
Other current assets	1.05	1.37	1.26
Inventory	48.94	46.47	47.32
Total current assets	89.22	80.05	83.19
Fixed assets	8.50	19.62	15.82
Other assets	2.28	0.33	0.99
Total assets	100.00	100.00	100.00

Table XVIII. Total Liabilities and Net Worth of Sales Group E, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group E average
Number of firms	4	5	9
Accounts payable	$ 27,148.65	$ 32,430.63	$ 30,083.09
Notes payable	53,766.65	63,158.01	58,984.07
Accrued liabilities	6,746.25	19,393.91	13,772.72
Total current liabilities	$ 87,661.55	$114,982.55	$102,839.88
Long-term liabilities	3,750.00	10,483.58	7,490.88
Total liabilities	$ 91,411.55	$125,466.13	$110,330.76
Net worth	111,141.81	185,934.24	152,693.16
Total liabilities and net worth	$202,553.36	$311,400.37	$263,023.92
	Percent of total assets		
Accounts payable	13.40	10.41	11.43
Notes payable	26.54	20.28	22.43
Accrued liabilities	3.34	6.23	5.24
Total current liabilities	43.28	36.92	39.10
Long-term liabilities	1.85	3.37	2.85
Total liabilities	45.13	40.29	41.95
Net worth	54.87	59.71	58.05
Total liabilities and net worth	100.00	100.00	100.00

Table XIX. Statement of Profit and Loss of Sales Group E, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	High profit	Group E average
Number of firms	4	5	9
SALES	$472,786.80	$537,986.63	$509,008.92
COST OF GOODS SOLD	403,907.77	425,860.12	416,103.52
GROSS MARGIN	68,879.03	112,126.51	92,905.40
EXPENSES:			
Salaries	35,110.72	41,748.52	38,798.39
Advertising and sales promotion	2,737.22	3,910.76	3,389.18
After sale expense	1,474.62	2,863.58	2,246.27
Depreciation and rent	4,754.46	6,882.10	5,936.48
Auto and truck expense	1,390.40	2,765.13	2,154.14
Taxes and licenses	3,645.68	6,004.64	4,956.21
Insurance	3,438.29	3,536.96	3,493.10
Shop expense	2,191.07	2,709.22	2,478.93
Telephone and telegraph	725.38	1,823.63	1,335.52
Heat, lights, water	2,095.69	1,635.93	1,840.27
Professional services	729.04	503.85	603.93
Office expense	333.50	1,185.80	807.00
Bad debts	4,309.75	1,869.05	2,953.80
Interest	2,166.37	2,024.62	2,087.62
Dues and subscriptions	135.37	252.87	200.65
Postage	471.09	642.65	566.40
Travel and entertainment	1,099.09	1,343.85	1,235.07
Repairs	1,126.73	886.01	993.00
Miscellaneous expense	1,977.01	2,819.36	2,444.98
TOTAL EXPENSES	69,911.48	85,408.53	78,520.94
PROFIT FROM OPERATIONS	(1,032.45)*	26,717.98	14,384.46
OTHER INCOME	8,423.03	12,394.82	10,629.58
PROFIT BEFORE INCOME TAXES	7,390.58	39,112.80	25,014.04

* Negative figure.

Table XX. Statement of Profit and Loss as a Percent of Sales of Sales Group E, by Profit Groups, Virginia, 1960

Item	Profit group: Low profit	Profit group: High profit	Group E average
Number of firms	4	5	9
		Percent of sales	
SALES	100.00	100.00	100.00
COST OF GOODS SOLD	85.43	79.16	81.75
GROSS MARGIN	14.57	20.84	18.25
EXPENSES:			
Salaries	7.43	7.76	7.62
Advertising and sales promotion	0.58	0.73	0.67
After sale expense	0.31	0.53	0.44
Depreciation and rent	1.01	1.28	1.17
Auto and truck expense	0.30	0.51	0.42
Taxes and licenses	0.77	1.12	0.97
Insurance	0.73	0.66	0.69
Shop expense	0.46	0.50	0.48
Telephone and telegraph	0.15	0.34	0.26
Heat, lights, water	0.44	0.30	0.36
Professional services	0.15	0.09	0.12
Office expense	0.07	0.22	0.16
Bad debts	0.91	0.35	0.58
Interest	0.46	0.38	0.41
Dues and subscriptions	0.03	0.05	0.04
Postage	0.10	0.12	0.12
Travel and entertainment	0.23	0.25	0.24
Repairs	0.24	0.16	0.20
Miscellaneous expense	0.42	0.52	0.48
TOTAL EXPENSES	14.79	15.87	15.42
PROFIT FROM OPERATIONS	(0.22)*	4.97	2.83
OTHER INCOME	1.78	2.30	2.09
PROFIT BEFORE INCOME TAXES	1.56	7.27	4.92

* Negative figure.

Table XXI. Capital Relationship Ratios of 62 Retail Farm Equipment Businesses, by Sales Groups and Profit Groups, Virginia, 1960

Profit group	No. of firms	Sales to net working capital	Cash and receivables to current liabilities	Current assets to current liabilities
A				
Low	4	3.12	0.34	1.90
High	4	1.63	3.82	6.23
Av.	8	2.02	1.46	3.29
B				
Low	7	3.59	0.91	2.71
High	8	8.00	0.29	1.30
Av.	15	5.12	0.44	1.65
C				
Low	7	5.19	0.24	1.68
High	8	4.16	0.75	2.30
Av.	15	4.59	0.46	1.95
D				
Low	7	3.99	0.46	2.08
High	8	4.19	0.95	2.76
Av.	15	4.10	0.67	2.37
E				
Low	4	5.08	0.91	2.06
High	5	4.01	0.87	2.17
Av.	9	4.39	0.89	2.13
All firms				
Low	31	4.79	0.41	1.74
High	31	3.99	0.89	2.43
Av.	62	4.24	0.66	2.10

Table XXII. Profit Relationship Ratios of 62 Retail Farm Equipment Businesses, by Sales Groups and Profit Groups, Virginia, 1960

Profit group	No. of firms	Net profit to net worth	Net profit to sales	Gross margin to sales
		(Percent)	(Percent)	(Percent)
A				
Low	4	(8.39)*	(4.89)*	16.44
High	4	7.48	4.82	20.58
Av.	8	1.36	0.84	18.89
B				
Low	7	(8.10)*	(2.50)*	13.70
High	8	14.47	3.27	20.63
Av.	15	2.36	0.63	17.45
C				
Low	7	(3.44)*	(0.79)*	14.30
High	8	14.05	5.02	18.96
Av.	15	7.80	2.33	16.80
D				
Low	7	2.64	0.44	16.97
High	8	14.11	4.98	16.61
Av.	15	10.91	2.95	16.77
E				
Low	4	6.65	1.56	14.57
High	5	21.04	7.27	20.84
Av.	9	16.42	4.92	18.25
All firms				
Low	31	(2.52)*	(0.62)*	16.02
High	31	15.45	5.01	18.13
Av.	62	10.02	2.97	17.37

* Negative figure.

Table XXIII. Merchandise Relationship Ratios of 62 Retail Farm Equipment Businesses, by Sales Groups and Profit Groups, Virginia, 1960

Profit group	No. of firms	Inventory turnover	Inventory to net working capital (Percent)
A			
Low	4	1.36	191.49
High	4	2.40	53.99
Av.	8	1.81	90.51
B			
Low	7	2.89	107.26
High	8	1.95	322.96
Av.	15	2.31	183.11
C			
Low	7	2.15	207.44
High	8	2.61	129.21
Av.	15	2.37	161.03
D			
Low	7	2.24	148.15
High	8	3.25	107.36
Av.	15	2.71	126.10
E			
Low	4	4.33	100.24
High	5	2.88	110.17
Av.	9	3.37	106.54
All firms			
Low	31	2.22	180.80
High	31	3.00	108.62
Av.	62	2.66	131.70

ABSTRACT

Data obtained by mail questionnaire and financial statements of sixty-two firms permitted a partial description and analysis of Virginia's retail farm equipment industry.

The data were combined and analyzed according to sales and profit groups. The primary analysis used was comparative analysis. Selected business ratios, sales per employee, and returns to management were computed for each sales group. Analysis of gross margin by departments was made for thirty-three firms by sales groups within and among departments.

Among and within analysis of variance was used to test whether statistically significant differences existed among sales groups. Separation of means was used to determine which means were significantly different. The standard deviation and coefficient of variation were calculated to measure the variation among firms. The range, arithmetic mean, and median were also computed. Regression analysis was employed to measure the effects of selected factors on net profits.

Wide variations existed in net profits for the sample firms. Evidence of economies of scale was found. There were firms within each sales group which showed substantial profits. However, there were firms within four of the five sales groups which had severe losses.

Volume of sales, other income, gross margin, operating expenses, advertising, and inventory turnover were statistically significant in explaining the variation in net profits. However, advertising and inventory turnover did not affect net profits as hypothesized.

It was concluded that research of particular segments of the businesses is needed. The information as presented, however, should prove valuable to management in delineating problem areas.