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For Wood Product Firms...The Use of Financial Indicators
Michigan State University
Cooperative Extension Service
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August 1982
8 pages

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For Wood Products Firms . . .

The Use of Financial Indicators

By Henry A. Huber, Extension Specialist, Forestry Dept.

Financial indicator ratios can be useful to any business regardless of size, and the largest of companies use them to measure financial progress and determine potentially weak areas that may need further attention. Smaller companies can and should use indicator ratios, and this publication is designed to assist small businessmen in the forest products area, particularly in pallet manufacturing, to do a more effective job of business management.

Not only should a small businessman frequently compare his own financial ratios, but it is usually helpful if he can compare his own business with other similar businesses of the same type.

A financial ratio is simply a relationship between two sets of dollar values expressed as a single figure. The Department of Forestry and the Cooperative Ex-

tension Service of Michigan State University have compiled, with the assistance of a number of cooperating Michigan and U.S. pallet manufacturers, a series of important financial indicator ratios. These ratios can assist the businessman in making management decisions, and when considered as a whole, reflect to a measure the condition of the pallet manufacturing business.

Information from Pallet Manufacturers

We will make three major divisions for each sales dollar received by individual companies. They are (1) operating expenses, (2) cost of raw materials, (3) income or profit (before tax). Each sales dollar received by the company is assigned to one of these three categories (Figure 1).

Operating expenses is the largest of the three items and the one the manager can best influence. Therefore, the 53 percent assigned to operating expense is further subdivided (Figure 2).

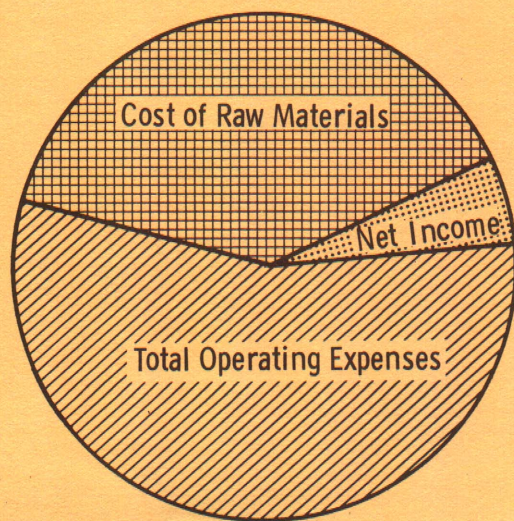


Figure 1. Major Sales Dollar Allocation.

Other Ratios of Interest

Other ratios may be calculated and useful to forest products manufacturers, such as these six.

1. $\frac{\text{Sales}}{\text{Accounts Receivable}}$
2. $\frac{\text{Sales}}{\text{Inventory}}$
3. $\frac{\text{Sales}}{\text{Fixed Assets}}$
4. $\frac{\text{Sales}}{\text{Total Assets}}$
5. $\frac{\text{Sales}}{\text{Liabilities}}$
6. $\frac{\text{Net Income}}{\text{Sales}}$

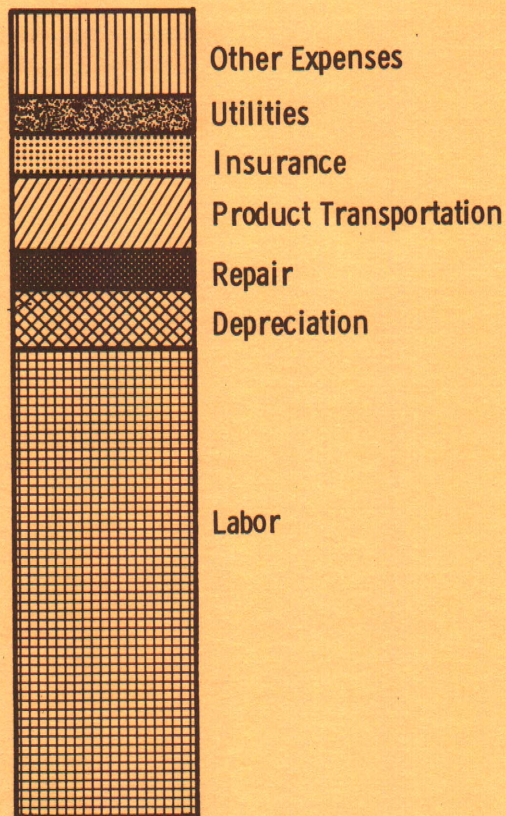


Figure 2. Operating Expense Allocation as a Ratio of Sales Dollar.

How to Calculate Financial Ratios

Indicator ratios can be calculated from the individual firms operating financial statements. The dollar value of sales, raw materials used, and total expenses and insurance are the major divisions. To determine raw materials used, follow this procedure:

Step I. Find the Raw Material Cost.

Beginning Inventory		
Logs	\$2,000.00	
Nails	200.00	
Subtotal		\$2,200.00
plus materials purchased		
	\$2,200.00	
	5,500.00	
Subtotal		\$7,700.00
less final inventory		
Logs	\$3,000.00	
Nails	200.00	
Subtotal		-3,200.00
TOTAL RAW MATERIAL USED		\$4,500.00

For this example, materials in process are considered nil and storage and handling costs are assigned to the material purchase cost.

Step II. Find the Operating Expense.

Total expenses are broken down into the following categories and totaled as below. All expenses for the firm, other than raw materials, should be included in this group.

Labor	\$2500.00
Depreciation	200.00
Repairs	400.00
Product Transportation	100.00
Insurance	300.00
Utilities	100.00
Other Expenses	400.00
TOTAL Operating Expense	\$4000.00
(for a given period of time.)	

Step III. Find the Net Income.

The sum of raw materials used, total expenses and net income should be equal to the sales dollar.

$$\text{Sales} - \text{Raw Materials} + \text{Expenses} = \text{Net Income.}$$

Step IV. Find Other Data.

Other items of financial information can be used to develop a more complete ratio picture:

- 1) Accounts Receivable
- 2) Inventory
- 3) Fixed Assets
- 4) Total Assets
- 5) Liabilities

Step V. Determining Ratios.

A financial ratio is merely a relationship between two sets of dollar values determined by dividing one by the other. Let's compare the cost of raw materials used to sales. Divide the cost of raw materials by total sales dollars.

$$\text{Example: } \frac{\text{Cost of raw materials used}}{\text{Sales}} = \frac{4,500}{10,000} = 45.0$$

Thus, the ratio for cost of raw materials to sales, is 45, meaning 45% of every sales dollar is used to purchase raw materials.

The ratio for total operating expenses can be found by dividing total operating expense by sales.

$$\text{Example: } \frac{\text{Total Operating Expense}}{\text{Sales}} = \frac{4,000}{10,000} = 40.0$$

Thus, 40% of the sales dollar in this example is used for operating expense. Likewise, net income to sales can be expressed as a ratio.

$$\text{Example: } \frac{1,500}{10,000} = 15.0$$

In the examples above 45 cents of each sales dollar went to purchase raw materials, 40 cents for expenses, and 15 cents for net profit.

Other ratios can be determined using the same method. The actual average ratios of 40 operating pallet manufacturers were calculated and are shown in Table 1. To show the range, the high and low are also presented in Table 1.

What do These Financial Ratios Mean?

The first three ratios are a percentage of the total sales dollar used for (1) purchase of raw materials, (2) operating expenses, and (3) net income or profit before income tax.

Each of these can be further broken down and financial ratios can then be determined. In Figure 2, operating expense is divided into seven important divisions. The first and largest of these is labor which for the selected 17 Michigan pallet manufacturers (Table 1) averaged 32.2 percent in 1970. (For every sales dollar, 32.2 cents were used for labor.) This ratio not only reflects the wage rate but also the productivity of the labor. If this ratio is high, it should be of concern to management and may be the result of a high hourly rate, or low production, or lack of mechanization, or any combination of the three.

The range of the labor to sales ratio for the 40 pallet manufacturers varied from 10.0 to 53.3 percent in 1970. It should be noted there was considerable variation in the amount of manufacturing labor performed by the 40 firms studied. Some used cut-to-size and length lumber and only nailed it into a pallet whereas others cut cants or squared logs into lumber, others cut their pallet material from a round log. Obviously, the greater amount of labor was involved in cutting round logs, and this difference in type of pallet operation accounted at least in part for the wide variation in the range of ratios.

The financial ratio can also assist in pricing the finished pallet. Any pallet manufacturer that cuts out a pallet based only on board feet overlooks a large portion of his costs which may be a completely different percentage than his raw material cost. See page 7 for a sample pricing sheet for pallets that takes into account the many factors that influence pallet cost.

Over the last 10 years, average pallet ratios have been calculated for cooperating firms in Michigan, (See Table II.) The pallet business is one of the earliest and important indicators of general business and economic conditions. Pallets are required before any manufactured parts or finished goods can be delivered. As the manufacturing tempo increases, more pallets are required and when orders for manufactured goods decline so does the need for pallets. If economists could determine the fluctuations in the pallet business it would be one of their best economic indicators.

TABLE I. AVERAGE FINANCIAL RATIO'S OF 40 U.S. AND CANADIAN PALLET MANUFACTURERS FOR 1970.

RATIO	MICHIGAN		U.S.*		TOTAL U.S.			
	NO. OF FIRMS	AVG. RATIO	NO. OF FIRMS	AVG. RATIO	NO. OF FIRMS	AVG. RATIO	HI RATIO	LO RATIO
SALES DOLLAR BREAKDOWN:								
<u>Cost of Raw Material</u> Sales	17	42.1	23	48.8	40	46.0	83.2	22.1
<u>Total Operating Expense</u> Sales	17	51.8	23	46.4	40	48.7	73.1	17.8
<u>Net Income (before tax)</u> Sales	17	6.1	23	4.8	40	5.3	16.8	-(1.0)
TOTAL		100.0		100.0		100.0		
OPERATING EXPENSE DOLLAR BREAKDOWN:								
<u>Labor</u> Sales	17	32.2	23	28.2	40	29.9	51.3	10.0
<u>Depreciation</u> Sales	17	3.3	23	2.8	40	3.0	7.0	0.2
<u>Repairs</u> Sales	17	2.5	23	2.0	40	2.2	4.9	0.5
<u>Product Transportation</u> Sales	17	4.9	23	4.2	40	4.5	10.7	0.6
<u>Insurance</u> Sales	17	2.0	22	1.2	39	1.6	5.4	0.4
<u>Utilities</u> Sales	17	2.0	23	1.2	40	1.5	5.4	0.1
<u>Other Expense</u> Sales	17	4.9	23	6.8	40	6.0	16.9	1.8
TOTAL		51.8		46.4		48.7		
OTHER RATIOS TO SALES DOLLAR:								
<u>Sales</u> Accounts Receivable	17	15.6	22	15.9	39	15.8	39.7	3.2
<u>Sales</u> Inventory	14	21.4	21	21.9	35	21.7	87.8	5.5
<u>Sales</u> Fixed Assets	17	5.5	23	9.4	40	7.7	54.3	1.1
<u>Sales</u> Total Assets	17	2.6	23	30.9	40	18.9	10.6	0.7
<u>Sales</u> Liabilities	15	8.7	22	11.7	37	10.5	68.2	0.7
OTHER IMPORTANT RATIOS								
<u>Net Income</u> Total Assets	17	13.6	23	13.1	40	13.3	79.0	-(4.7)
<u>Net Income</u> Replacement Value	15	19.5	21	16.4	36	17.7	82.0	-(4.5)

* United States and Canada, except Michigan.

TABLE II. FINANCIAL RATIOS OF PALLET MANUFACTURES CLASSIFIED BY SIZE, RAW MATERIAL USED AND PRODUCT PRODUCED.

RATIO	Sales Dollar Size*			Raw Material Used		Pallet Product Manufactured	
	A&B (20)	C (13)	D (6)	Lumber (20)	Logs (18)	Ware-house (15)	Expend-able (23)
SALES DOLLAR BREAKDOWN:							
<u>Cost of Raw Material</u>							
Sales	49.5	43.8	36.9	52.4	38.4	38.1	44.0
<u>Total Operating Exp.</u>							
Sales	46.0	50.4	56.0	42.8	56.4	45.6	51.9
<u>Net Income (before tax)</u>							
Sales	4.5	5.8	7.1	4.8	5.2	6.3	4.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
OPERATING EXPENSE DOLLAR BREAKDOWN:							
<u>Labor</u>							
Sales	28.2	30.9	35.1	25.9	35.3	26.9	32.9
<u>Depreciation</u>							
Sales	2.6	3.3	3.6	2.6	3.3	3.0	3.0
<u>Repairs</u>							
Sales	2.1	2.5	2.2	1.8	2.8	2.4	2.2
<u>Product Transp.</u>							
Sales	4.2	4.7	5.4	3.6	5.6	4.4	4.6
<u>Insurance</u>							
Sales	1.4	1.6	2.0	1.0	2.1	1.2	1.7
<u>Utilities</u>							
Sales	1.2	1.5	2.8	1.1	2.0	1.3	1.6
<u>Other Expenses</u>							
Sales	6.3	5.9	4.9	6.8	5.3	6.4	6.0
TOTAL	46.0	50.4	56.0	42.8	56.4	45.6	51.9
OTHER RATIOS TO SALES DOLLAR:							
<u>Sales</u>							
Accts. Receivable	13.7	18.2	17.5	16.4	15.7	13.4	16.5
<u>Sales</u>							
Inventory	17.9	28.7	13.3	21.9	23.3	14.0	25.6
<u>Sales</u>							
Fixed Assets	9.7	5.1	7.3	7.6	8.4	10.0	6.2
<u>Sales</u>							
Total Assets	2.8	3.2	3.1	3.2	2.8	2.4	3.3
<u>Sales</u>							
Liabilities	11.7	5.9	14.4	12.8	8.2	10.3	10.6
OTHER IMPORTANT RATIOS							
<u>NET INCOME</u>							
TOTAL ASSETS	8.8	20.1	15.6	14.0	14.2	11.6	13.7
<u>NET INCOME</u>							
REPLACEMENT VALUE	15.2	23.5	16.2	13.9	23.5	22.8	12.8

* Size by Sales Dollar A & B = 500,000+; C = 200,000 to 499,999; D = 0 to 199,999.

TABLE III. AVERAGE FINANCIAL RATIOS OF SELECTED MICHIGAN PALLET MANUFACTURERS BY YEAR.

AVERAGE RATIO BY YEAR										
RATIO	1961	1962	1963	1964	1965	1966	1967	1968	1969	1971
<u>Cost of Raw Material</u> Sales	32.5	35.8	37.2	34.6	36.2	39.9	38.7	33.6	40.5	51.1
<u>Total Expenses</u> Sales	63.5	59.4	57.5	58.2	55.6	53.0	55.8	59.2	53.3	48.1
<u>Net Income - Before Tax</u> Sales	4.0	4.8	5.3	7.2	8.2	7.1	5.5	7.2	5.3	.8
<u>Labor Cost</u> Sales	36.2	33.8	34.7	32.7	33.6	31.7	32.6	36.2	32.9	27.7
<u>Depreciation</u> Sales	4.4	4.9	4.0	4.0	3.9	4.0	4.0	4.5	3.4	3.8
<u>Repairs</u> Sales	3.2	2.7	2.7	2.3	3.0	2.2	2.4	3.3	2.5	2.3
<u>Product Transport</u> Sales	3.9	4.8	3.9	4.3	3.8	1.2	*5.6	*5.6	*5.3	3.8
<u>Insurance</u> Sales	2.2	3.2	2.0	3.0	2.7	3.1	3.2	2.7	2.2	2.3
<u>Utilities</u> Sales								2.2	2.2	1.5
<u>Other Expenses</u> Sales	13.6	10.0	10.2	11.9	8.6	10.8	8.2	4.8	4.8	6.7
<u>Sales</u> Accounts Receivable	37.0	35.1	24.3	27.1	16.6	20.5	15.8	17.2	15.6	17.2
<u>Sales</u> Inventory	23.9	19.3	41.0	46.8	40.2	28.2	30.9	31.8	23.4	20.2
<u>Sales</u> Fixed Assets	5.3	5.2	12.7	4.1	4.9	6.0	5.5	7.1	5.2	6.0
<u>Sales</u> Total Assets	3.3	3.2	4.5	2.9	2.7	2.7	3.4	2.7	2.6	2.6
<u>Sales</u> Liabilities	12.3	10.2	12.4	22.6	11.7	9.3	8.7	10.7	8.1	6.6
<u>Net Income</u> Total Assets	6.3	7.4	16.7	16.3	22.8	19.0	21.6	23.4	14.5	4.8
<u>Net Income</u> Replacement Value									20.8	8.8

*Before 1967 only gas and oil were entered.

**SAMPLE
PALLET COST SHEET**

COMPANY _____ PHONE _____

(NAME & ADDRESS) _____ DATE _____

Size _____

Quantity _____

Parts size Stringer _____

deck _____

Thickness _____

Width _____

Length _____

Bd. Ft. _____

Species _____

Material Cost _____

ASSEMBLY LABOR (By Operation) _____

1. _____

2. _____

3. _____

HANDLING _____

BURDEN (By Operation) _____

1. _____

2. _____

3. _____

NAILS (Staples) _____

SPECIAL _____

SELLING & ADMIN. _____

NET COST _____

DELIVERY _____

PROFIT _____

DISCOUNT _____

DELIVERED SELLING PRICE _____

MICHIGAN STATE UNIVERSITY



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