

FINANCIAL RATIO ANALYSIS FOR DECISION-MAKING¹

by W.R. Luckham

Managers are responsible for the business health of their firms. It is their responsibility to avoid financial mistakes. Since money is the life blood of any business, successful commercial arborists must understand and manage this flow of debt and equity capital as it is used in various parts of their business if they are to guide the firm to achieve its' goals. They know that money costs money and that they must earn more than it costs if the business is to turn a profit.

Most tree care companies employ a mixture of debt and equity capital. How this mix is managed is crucial to business health. The financial side of the business can be managed by the use of appropriate financial management strategies just as the physical side of the business is managed. Financial ratios, which measure the relationship between two financial items or categories, are useful tools in this process. Ratios are like symptoms in that they do not tell you what is wrong, but rather guide your thinking and analysis into areas where problems may exist. They facilitate comparisons among unwieldy numbers, among various parts of the business as well as among different industry firms. When analyzed over time they can provide an early warning system to detect emerging trends in the financial condition of the business.

In order to properly use financial ratios in managerial decision making, it is necessary to understand how the firm works — from the financial viewpoint. The ratios should be used as a system of symptom identifiers and should be viewed over time rather than looking at an isolated figure. Further, some type of benchmark is extremely valuable. Industry standards for similar sized firms, classified as to profit level, provide good gauges for managerial analysis. Lacking the industry guides, data from a cooperative competitor or data from the firm's previous years'

records are useful in identifying improving or deteriorating financial conditions.

The basic data needed to develop ratios for analysis are found in two important financial statements: 1) the operating or Profit and Loss Statement (see Table 1) which provides data for a period of time (usually one year but often monthly or quarterly), and 2) the balance sheet or Net Worth Statement (see Table 2) which provides data for one point in time (usually at the end of the operating year).

Examples of these two statements are illustrated using data from a hypothetical firm, Acme Tree Service, Inc. Acme is about seven years old and employs four full-time employees (a foreman, climber, plus two ground workers) in addition to the manager and a part-time secretary/bookkeeper. The manager spends about one-half of his time actively working with a crew.

The operating statement is set up in a non-traditional way in order to yield better management information. The major difference is that all of the items under income and expense are cash items rather than a comingling of cash and non-cash expenses. Thus, the manager can quickly determine the amount of cash available to meet debt service, provide for replacement of worn out assets or for business expansion. This net cash income is adjusted for changes in supply and material inventories to reflect actual use, not just purchases, as the first step in bringing the statement into conformity with accrual accounting procedures and yields profit before depreciation. This step also allows the manager to keep an eye on the buildup of inventory as part of his overall cost control program. The second adjustment — for capital items — determines the annual charge for depreciation. It picks up purchases and sales of capital items as well as the non-cash depreciation charges and determines the bottom line profit-

¹Presented at the annual conference of the International Society of Arboriculture in Louisville, Kentucky in August 1982.

TABLE 1.

OPERATING STATEMENT

ACME TREE SERVICE, INC.

January 1 - December 31, 1981

CASH RECEIPTS		CASH OPERATING EXPENSE	
Pruning	\$ 80,800	Salaries	\$ 29,600
Spraying	45,600	Labor (incl. Fringe Benefits)	59,800
Tree Removal	21,900	Insurance	17,565
Landscaping	30,900	Materials & Supplies	10,500
Misc.	1,800	Sub-contractors	2,535
		Interest	13,352
		Equipment Repairs	3,500
		Gas, oil	9,428
		Equipment Rent	1,500
		Building Repairs	1,300
		Telephone	1,320
		Office Supplies	1,400
		Professional Services	1,500
		Licenses & Permits, Taxes	1,200
		Advertising	500
		Travel & Entertainment	500
		Dues, Subscriptions & Contributions	1,200
		Misc. Expenses	800
TOTAL	Receipts <u>\$181,000</u>	TOTAL	<u>\$157,500</u>

NET CASH INCOME \$ 23,500

ADJUSTMENTS FOR CHANGE IN OPERATING INVENTORY

	Materials & Supplies	Accounts Receivable	Accounts Payable	
Beginning Inventory	\$4,200	\$ _____	End of Period \$ _____	
Ending Inventory	<u>5,400</u>	_____	Beg. of Period \$ _____	
Net Change	<u>\$1,200</u>	+ \$ _____	+ _____	= \$ 1,200

NET OPERATING PROFIT \$ 24,700

ADJUSTMENTS FOR CAPITAL ITEMS

	Machinery & Equipment	Buildings - Improvements	
Beginning Inventory	\$ 40,770	\$ 36,800	
Purchases	-0-	-0-	
Sub-Total	\$ 40,770	\$ 36,800	
Ending Inventory	\$ 26,685	\$ 34,500	
Sales	-0-	-0-	
Sub-Total	\$ 26,685	\$ 34,500	
Net Change	\$ (14,085)	+ \$ (2,300)	= \$ (16,385)
			PROFIT (LOSS) \$ 8,315

TABLE 2. ACME TREE SERVICE, INC.
NET WORTH STATEMENT

DATE: December 31, 1981

<u>ASSETS</u>		<u>LIABILITIES</u>	
CURRENT:		CURRENT:	
Cash on Deposit	\$ 3,000	Notes Payable	\$ -0-
Accounts Receivable	<u>24,800</u>	Accounts Payable	<u>2,600</u>
Marketable Securities	<u>20,000</u>	Portion of Intermediate-Term	
Net Cash Surrender Value		Debt Due Within 12 months	<u>15,613</u>
of Life Insurance	<u>1,200</u>	Portion of Long-Term Debt	
Supplies	<u>3,600</u>	Due within 12 months	<u>10,566</u>
Other	<u>600</u>	Rent, Taxes, <u>Interest</u> Due	
TOTAL CURRENT	<u>\$ 53,200</u>	and Unpaid	<u>2,055</u>
		Other Debt Due Within 12	
INTERMEDIATE:		Months	<u>-0-</u>
Autos-Trucks	<u>\$ 16,125</u>	TOTAL CURRENT	<u>\$ 30,834</u>
Machinery-Equipment	<u>10,560</u>	INTERMEDIATE-TERM:	
Increase due to		Notes Payable	
Appreciation	<u>7,500</u>	Over 1 year but under	
Other	<u>\$</u>	8 years less portion	
TOTAL INTERMEDIATE	<u>\$ 34,185</u>	applied to current	
FIXED:		liabilities	<u>26,419</u>
Land	<u>\$ 18,000</u>	TOTAL INTERMEDIATE-TERM	<u>\$ 26,419</u>
Building-Improvements	<u>34,500</u>	LONG TERM:	
Other	<u>1,200</u>	Notes Payable	
Increase due to		8 years or over less	
Appreciation	<u>19,300</u>	portion applied to	
TOTAL FIXED	<u>\$ 73,000</u>	current liabilities	<u>\$ 45,297</u>
TOTAL ASSETS	<u>\$160,385</u>	Other	
		TOTAL LONG-TERM	<u>\$ 45,297</u>
		TOTAL LIABILITIES	<u>\$102,550</u>
		NET WORTH	<u>\$ 57,835</u>
		Liabilities + Net Worth	<u>\$160,385</u>

CONTINGENT LIABILITIES:

NOTES:

before-tax picture.

The **net worth statement** is fairly typical in layout except that assets are classed according to time and function in the firm. For example, **current assets** consist of cash or other assets that will (or could) become cash through normal operation during the course of the business year. **Current liabilities** include those items due and payable on demand or within the operating year.

Intermediate assets consist of those resources used primarily to support business operations rather than those which are expected to be sold or converted to cash through the normal flow of sales. **Intermediate Liabilities** are those which become due and payable beyond one year but less than 8 years.

Fixed assets are comprised primarily of land and buildings while **Long Term Liabilities** are usually mortgages due and payable over more than 8 years. **Net worth** or owners equity is a residual or the difference between the values of total assets and total liabilities. It is what would be left over if the firm were to be sold at an "arms length" sale and all outstanding claims from creditors paid.

Ratio Analyses

The ratios presented have been divided into four major categories that address different areas of management concern: 1) **Liquidity** (a short run look at the firm's ability to pay its bills as they become due; 2) **Solvency** (a longer run look at firm survival); 3) **Profitability** (relating profit — before or after tax to sales, total assets employed or to owners investment); and 4) **Efficiency** (selected measures that measure how well the firm is employing its resources).

The following ratios (see Table 3) have proved to be useful in a number of business analyses. Managers may select from these or compute other ratios which are especially meaningful to their businesses. For ease of comparison, these ratios should be calculated for several consecutive time periods and maintained in either a tabular or chart form.

Liquidity Ratios

The first group of ratios evaluate the liquidity of Acme Tree Service, Inc. Acme has a Current ratio

of 1.73, which means that it has \$1.73 of current assets for every \$1 of current liabilities. The general standard applied by bankers for the ratio is 2:1 but may vary from .5:1 to 3:1 or more depending upon the type of business, when the ratio was computed and the nature and timing of the current liabilities.

The Quick or Acid test ratio is a refinement of the current ratio in that it excludes inventory and any other current asset which cannot be quickly converted to cash. For Acme the ratio has a maximum of 1.55 to 1 but could be as low as .14 to 1 if the accounts receivable and marketable securities took some time to liquidate and the major portion of the current liabilities were due now. The general standard for the ratio is 1 to 1 or \$1 of quick assets for every \$1 of current debt.

Solvency Ratios

The second group of ratios look at use and structure of debt. Ratio #3, Leverage, indicates that Acme is using \$1.77 of debt capital for every \$1 of owner invested capital. Leverage is almost 2 while the lenders prefer to see a leverage figure of 1 or less. Obviously, a fairly young firm is going to be more highly levered than a more mature firm (unless the mature firm is in serious financial difficulty). Ratio #4 indicates Acme has 53 cents of current debt for every \$1 of owner capital. Further, Ratio #5 points out that 30% of the total debt is current. These three ratios (Leverage 1.77, Current debt to worth .53 and Debt structure .30) indicate impending trouble unless the firm is well managed and earning significant cash in a timely fashion. Overall the firm owes 64 cents for every \$1 of owner capital (Ratio #6). One would expect this ratio to be trending downward as the firm continues to develop. Since Acme is only about 7 years old, the figure is not alarming — unless the firm is not performing well. Lenders would like to see this ratio at .50 to 1 or less.

Profitability Ratios

The third category of ratios are not at all encouraging. While Ratio #7, Return on Investment, Net worth or, owners equity (ROI) indicates a 14.4% return on investment, remember that investment is relatively small. A better measure is Ratio #8, Return on Assets (ROA) which indicates

Table 3.

RATIO ANALYSIS
Acme Tree Service, Inc.
1981

LIQUIDITY RATIOS

$$(1) \text{ Current Ratio} \quad \frac{CA}{CL} = \frac{\$53,200}{\$30,834} = 1.73:1$$

$$(2) \text{ Quick (Acid Test) Ratio} \quad \frac{CA - \text{Inv.}}{CL} = \frac{\$53,200 - \$5,400}{\$30,834} = 1.55:1$$

SOLVENCY RATIOS

$$(3) \text{ Leverage} \quad \frac{TL}{NW} = \frac{\$102,550}{\$57,835} = 1.77$$

$$(4) \text{ Current Debt to Worth} \quad \frac{CL}{NW} = \frac{\$30,834}{\$57,835} = 0.53$$

$$(5) \text{ Debt Structure} \quad \frac{CL}{TL} = \frac{\$30,834}{\$102,550} = .30$$

$$(6) \text{ Net Capital Ratio} \quad \frac{TL}{TA} = \frac{\$102,550}{\$160,385} = .64$$

PROFITABILITY RATIOS

$$(7) \text{ Return on Equity} \quad \frac{N.Pr}{N.W.} = \frac{\$8,315}{\$57,835} \times 100 = 14.37\%$$

$$(8) \text{ Return on Assets} \quad \frac{N.Pr}{T.A.} = \frac{\$8,315}{\$160,385} \times 100 = 5.18\%$$

$$(9) \text{ Return on Sales} \quad \frac{N.Pr}{Gr. Sales} = \frac{\$8,315}{\$181,000} \times 100 = 4.59\%$$

EFFICIENCY RATIOS

$$(10) \text{ Sales per \$1 Expense} \quad \frac{Sales}{Expense} = \frac{\$181,000}{\$172,685} = \$1.05$$

$$(11) \text{ Sales per man} \quad \frac{Sales}{\# \text{ People}} = \frac{\$181,000}{4.5} = \$40,222$$

$$(12) \text{ Sales per \$1 Labor Expense} \quad \frac{Sales}{Labor Exp.} = \frac{\$181,000}{\$69,800} = \$2.59$$

$$(13) \text{ Cash Expense (-interest paid)/} \\ \text{Cash Receipt Ratio} \quad \frac{\$157,000 - \$13,352}{\$181,000} \times 100 = 79.64\%$$

that Acme is only earning 5.2% on its total assets. Currently, 100% safe, investments are yielding 10-12% or more. Thus, a large red flag is raised, which when viewed along with prior comments should cause management to pursue a vigorous analysis of the firm. Cost control, pricing and overall firm efficiency should be especially evaluated. The final ratio of this group, Profit on Sales (Ratio #9) continues the trend by reporting a profit before tax of only 4.6 cents on each dollar of sales.

Efficiency Ratios

The final group of ratios to be evaluated center on the firm's efficiency in the use of resources. Ratio #10 computes the average sales per man or about \$40,000 based upon 4 full time men plus about ½ of the manager's time. What sales volume should be generated per man? In prior years, \$40,000 was fairly reasonable. With the inflation of the past few years, this figure should be substantially higher — if the firm's (and industries') pricing strategies have kept pace with the economy. Perhaps \$60-\$70,000 may not be unreasonable. Ratio #12 indicates that Acme earned \$2.59 for every \$1 spent on labor. Again, either efficiency or pricing appear to be areas of concern. This concern is heightened by Ratio #11, which indicates that Acme spent \$1 for every \$1.05 received in income. Again, the returns are not nearly sufficient for the risks involved.

The Next Step

Emphasis should be directed to overall cost control as well as to pricing policies and general firm efficiency. Item by item comparison with industry standards or averages would be an appropriate next step. The final ratio #13 (Cash Operating Expense to Cash Receipts) raises a further red flag by indicating that Acme has cash expenses of almost 80 cents for every \$1 of gross income. (Generally a ratio of 60-65:100 represents a sound condition, 70-75:100 is an area of potential danger, and 80 or more per 100

indicates the likelihood of financial difficulty). This leaves 20 cents of every sales dollar to cover debt service. Current debt service (Net Worth Statement) requires almost 16 cents out of every sales dollar. Lenders would *like* to see a cushion of 20% above debt service to cover unforeseen events and provide security for the loans. Again, Acme is marginal.

Summary and Conclusion

Overall, Acme is walking a tight rope and is dependent upon everything working as planned in order to survive. The fact that interest expense ranks among the top 5 items on the operating statement should raise a red flag. With insurance in the number 3 spot, questions should be raised to determine why and institute corrective programs. While the debt structure is a little heavy in the current area, it is manageable as long as the business holds up, the accounts get collected and the firm avoids "new paint fever." The major area of concern is with the operating statement items as previously discussed, and an in-depth analysis appears to be warranted. Some analysis of the costs and returns associated with each of the services would be in order, with the possibility of restructuring the business if necessary. Labor costs and labor efficiency are important cost control area. Acme should explore its labor recovery rate, i.e., what percent of the labor that Acme paid for did Acme actually get paid for? This may reveal areas of inefficiency that might ordinarily go undetected. Finally, serious attention should be devoted to the pricing area. This is generally the one area which has the most impact on the long run survival of the firm. Acme has the potential to become a much more profitable firm, it also has the potential to fail. It is largely up to management.

*Extension Economist
Agricultural Marketing
Department of Agricultural Economics
VPI&SU
Blacksburg, VA*