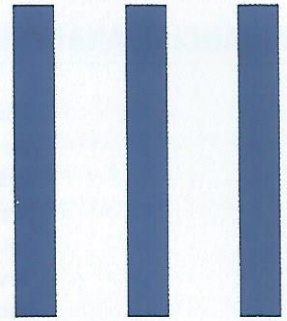


Section



Financial Analysis for Marketing Decisions

FINANCIAL ANALYSIS

Financial analysis is an important aspect of strategic marketing planning and should be an integral part of marketing problem and case analysis. In this section, we present several financial tools that are useful for analyzing marketing problems and cases. First, we investigate break-even analysis, which is concerned with determining the number of units or dollar sales, or both, necessary to break even on a project or to obtain a given level of profits. Second, we illustrate net present value analysis, which is a somewhat more sophisticated tool for analyzing marketing alternatives. Finally, we investigate ratio analysis, which can be a useful tool for determining the financial condition of the firm, including its ability to invest in a new or modified marketing program.

Breakeven Analysis

Breakeven analysis is a common tool for investigating the potential profitability of a marketing alternative. The *breakeven point* is that level of sales in either units or sales dollars at which a firm covers all of its costs. In other words, it is the level at which total sales revenue just equals the total costs necessary to achieve these sales.

To compute the breakeven point, an analyst must have or be able to obtain three values. First, the analyst needs to know the selling price per unit of the product (*SP*). For example, suppose the Ajax Company plans to sell its new electric car through its own dealerships at a retail price of \$5,000. Second, the analyst needs to know the level of fixed costs (*FC*). Fixed costs are all costs relevant to the project that do not change regardless of how many units are produced or sold. For instance, whether Ajax produces and sells 1 or 100,000 cars, Ajax executives will receive their salaries, land must be purchased for a plant, a plant must be constructed, and machinery must be purchased. Other fixed costs include such things as interest, lease payments, and sinking fund payments. Suppose Ajax has totaled all of its fixed costs and the sum is \$1.5 million. Third, the analyst must know the variable costs per unit produced (*VC*). As the name implies, variable costs are those that vary directly with the number of units produced. For example, each car Ajax produces involves costs for raw materials and components to build the car, such as batteries, electric motors, steel bodies, and tires; labor costs for operating employees; and machine costs, such as electricity and welding rods. Suppose Ajax totals these costs and the variable costs for each car produced equal \$3,500. With this information, the analyst can now determine the breakeven point, which is the number of units that must be sold to just cover the cost of producing the cars. The breakeven point is determined by dividing total fixed costs by the *contribution margin*. The contribution margin is simply the difference between the selling price per unit (*SP*) and variable costs per unit (*VC*). Algebraically,

$$\begin{aligned} BEP_{(\text{in units})} &= \frac{\text{Total fixed costs}}{\text{Contribution margin}} \\ &= \frac{FC}{SP - VC} \end{aligned}$$

Substituting the Ajax estimates,

$$\begin{aligned} BEP_{(\text{in units})} &= \frac{1,500,000}{5,000 - 3,500} \\ &= \frac{1,500,000}{1,500} \\ &= 1,000 \text{ units} \end{aligned}$$

In other words, the Ajax Company must sell 1,000 cars to just break even (i.e., for total sales revenue to cover total costs).

Alternatively, the analyst may want to know the breakeven point in terms of dollar sales volume. Of course, if the preceding analysis has been done, one could simply multiply the $BEP_{(in\ units)}$ times the selling price to determine the breakeven sales volume (i.e., 1,000 units \times \$5,000/unit = \$5 million). However, the $BEP_{(in\ dollars)}$ can be computed directly, using the following formula:

$$\begin{aligned} BEP_{(in\ dollars)} &= \frac{FC}{1 - \frac{VC}{SP}} \\ &= \frac{1,500,000}{1 - \frac{3,500}{5,000}} \\ &= \frac{1,500,000}{1 - 0.7} \\ &= \$5,000,000 \end{aligned}$$

Thus, Ajax must produce and sell 1,000 cars, which equals \$5 million sales, to break even. Of course, firms do not want to just break even but want to make a profit. The logic of breakeven analysis can easily be extended to include profits (P). Suppose Ajax decided that a 20 percent return on fixed costs would make the project worth the investment. Thus, Ajax would need $20\% \times \$1,500,000 = \$300,000$ before-tax profit. To calculate how many units Ajax must sell to achieve this level of profits, the profit figure (P) is added to fixed costs in the preceding formulas. (We will label the breakeven point as BEP' to show that we are now computing unit and sales levels to obtain a given profit level.) In the Ajax example:

$$\begin{aligned} BEP'_{(in\ units)} &= \frac{FC + P}{SP - VC} \\ &= \frac{1,500,000 + 300,000}{5,000 - 3,500} \\ &= \frac{1,800,000}{1,500} \\ &= 1,200\ units \end{aligned}$$

In terms of dollars,

$$\begin{aligned} BEP'_{(in\ dollars)} &= \frac{FC + P}{1 - \frac{VC}{SP}} \\ &= \frac{1,500,000 + 300,000}{1 - \frac{3,500}{5,000}} \\ &= \frac{1,800,000}{1 - 0.7} \\ &= \$6,000,000 \end{aligned}$$

Thus, Ajax must produce and sell 1,200 cars (sales volume of \$6 million) to obtain a 20 percent return on fixed costs. Analysis must now be directed at determining whether a given marketing plan can be expected to produce sales of at least this level. If the answer is yes, the project would appear to be worth investing in. If not, Ajax should seek other opportunities.

Net Present Value Analysis

The profit-oriented marketing manager must understand that the capital invested in new products has a cost. It is a basic principle in business that whoever wishes to use capital must pay for its use. Dollars invested in new products could be diverted to other uses—to pay off debts, pay dividends to stockholders, or buy U.S. Treasury bonds that would yield economic benefits to the corporation. If, on the other hand, all of the dollars used to finance a new product have to be borrowed from lenders outside the corporation, interest has to be paid on the loan.

One of the best ways to analyze the financial aspects of a marketing alternative is *net present value* analysis. This method employs a discounted cash flow, which takes into account the time value of money and its price to the borrower. The following example will illustrate this method.

To compute the net present value of an investment proposal, the cost of capital must be estimated. The cost of capital can be defined as the required rate of return on an investment that would leave the owners of the firm as well off as if the project was not undertaken. Thus, it is the minimum percentage return on investment that a project must make to be worth undertaking. There are many methods of estimating the cost of capital. However, because these methods are not the concern of this text, we will simply assume that the cost of capital for the Ajax Corporation has been determined to be 10 percent.¹ Again, it should be noted that once the cost of capital is determined, it becomes the minimum rate of return required for an investment—a type of cutoff point. However, some firms in selecting their new product investments select a minimum rate of return that is above the cost of capital figure to allow for errors in judgment or measurement.

The Ajax Corporation is considering a proposal to market instant-developing movie film. After conducting considerable marketing research, sales were projected to be \$1 million per year. In addition, the finance department compiled the following information concerning the projects:

New equipment needed	\$700,000
Useful life of equipment	10 years
Depreciation	10% per year
Salvage value	\$100,000
Cost of goods and expenses	\$700,000 per year
Cost of capital	10%
Tax rate	50%

To compute the net present value of this project, the net cash flow for each year of the project must first be determined. This can be done in four steps:

1. Sales – Cost of goods and expenses = Gross income or

$$\$1,000,000 - 700,000 = \$300,000$$
2. Gross income – Depreciation = Taxable income or

$$\$300,000 - (10\% \times 600,000) = \$240,000$$

3. Taxable income – Tax = Net income or

$$\$240,000 - (50\% \times 240,000) = \$120,000$$

4. Net income + Depreciation = Net cash flow or

$$\$120,000 + 60,000 = \$180,000 \text{ per year}$$

Because the cost of capital is 10 percent, this figure is used to discount the net cash flows for each year. To illustrate, the \$180,000 received at the end of the first year would be discounted by the factor $1/(1 + 0.10)$, which would be $180,000 \times 0.9091 = \$163,638$; the \$180,000 received at the end of the second year would be discounted by the factor $1/(1 + 0.10)^2$, which would be $180,000 \times 0.8264 = \$148,752$, and so on. (Most finance textbooks have present value tables that can be used to simplify the computations.) The table that follows shows the present value computations for the 10-year project. It should be noted that the net cash flow for year 10 is \$280,000 because there is an additional \$100,000 inflow from salvage value.

Thus, at a discount rate of 10 percent, the present value of the net cash flow from new product investment is greater than the \$700,000 outlay required, and so the decision can be considered profitable by this standard. Here the net present value is \$444,560, which is the difference between the \$700,000 investment outlay and the \$1,144,560 discounted

Year	Net Cash Flow	0.10 Discount Factor	Present Value
1	\$ 180,000	0.9091	\$ 163,638
2	180,000	0.8264	148,752
3	180,000	0.7513	135,234
4	180,000	0.6830	122,940
5	180,000	0.6209	111,762
6	180,000	0.5645	101,610
7	180,000	0.5132	92,376
8	180,000	0.4665	83,970
9	180,000	0.4241	76,338
10	280,000	0.3855	107,940
Total	\$1,900,000		\$1,144,560

cash flow. The *present value ratio* is nothing more than the present value of the net cash flow divided by the cash investment. If this ratio is 1 or larger than 1, the project would be profitable for the firm to invest in.

There are many other measures of investment worth, but only one additional method will be discussed. It is the very popular and easily understood payback method. *Payback* refers to the amount of time required to pay back the original outlay from the cash flows. Staying with the example, the project is expected to produce a stream of cash proceeds that is constant from year to year, so the payback period can be determined by dividing the investment outlay by this annual cash flow. Dividing \$700,000 by \$180,000, the payback period is approximately 3.9 years. Firms often set a maximum payback period before a project will be accepted. For example, many firms refuse to take on a project if the payback period exceeds three years.

This example should illustrate the difficulty in evaluating marketing investments from a profitability or economic worth standpoint. The most challenging problem is that of developing accurate cash flow estimates because there are many possible alternatives, such as price of the product and channels of distribution, and the consequences of each alternative

MARKETING INSIGHT Selected Present Value Discount Factors

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Years	4%	6%	8%	10%	12%	14%
1	.9615	.9434	.9259	.9091	.8929	.8772
2	.9246	.8900	.8573	.8264	.7972	.7695
3	.8890	.8396	.7938	.7513	.7118	.6750
4	.8548	.7941	.7350	.6830	.6355	.5921
5	.8219	.7473	.6806	.6209	.5674	.5194
6	.7903	.7050	.6302	.5645	.5066	.4556
7	.7599	.6651	.5835	.5132	.4523	.3996
8	.7307	.6274	.5403	.4665	.4039	.3506
9	.7026	.5919	.5002	.4241	.3606	.3075
10	.6756	.5584	.4632	.3855	.3220	.2697

must be forecast in terms of sales volumes, selling costs, and other expenses. In spite of all the problems, management must evaluate the economic worth of new product and other decisions, not only to reduce some of the guesswork and ambiguity surrounding marketing strategy development but also to reinforce the objective of making profits.

Ratio Analysis

Firms' income statements and balance sheets provide a wealth of information that is useful for developing marketing strategies. Frequently, this information is included in marketing cases, yet analysts often have no convenient way of interpreting the financial position of the firm to make sound marketing decisions. Ratio analysis provides the analyst an easy and efficient method for investigating a firm's financial position by comparing the firm's ratios across time or with ratios of similar firms in the industry or with industry averages.

Ratio analysis involves four basic steps:

1. Choose the appropriate ratios.
2. Compute the ratios.
3. Compare the ratios.
4. Check for problems or opportunities.

1. Choose the Appropriate Ratios

The five basic types of financial ratios are (1) liquidity ratios, (2) asset management ratios, (3) profitability ratios, (4) debt management ratios, and (5) market value ratios.² While calculating ratios of all five types is useful, liquidity, asset management, and profitability ratios provide information that is most directly relevant for marketing decision making. Although many ratios can be calculated in each of these groups, we have selected two of the most commonly used and readily available ratios in each group to illustrate the process.

Liquidity Ratios One of the first considerations in analyzing a marketing problem is the liquidity of the firm. *Liquidity* refers to the ability of the firm to pay its short-term obligations. If a firm cannot meet its short-term obligations, there is little that can be done until this problem is resolved. Simply stated, recommendations to increase advertising, to do marketing research, or to develop new products are of little value if the firm is about to go bankrupt.

1. <http://finance.yahoo.com/>. Input the company symbol to receive financial ratios and other useful information. Under the "Company" heading, "Key statistics," "Competitors," and "Industry" are most useful for comparative ratio analyses.
2. *Annual Statement Studies*. Published by Robert Morris Associates, this work includes 11 financial ratios computed annually for over 150 lines of business. Each line of business is divided into four size categories.
3. *Industry Norms and Key Business Ratios*. Published by Dun & Bradstreet, this work provides a variety of industry ratios.
4. *Almanac of Business and Industrial Financial Ratios*. The almanac, published by Prentice Hall, Inc., lists industry averages for 22 financial ratios. Approximately 170 businesses and industries are listed.
5. *Quarterly Financial Report for Manufacturing Corporations*. This work, published jointly by the Federal Trade Commission and the Securities and Exchange Commission, contains balance-sheet and income-statement information by industry groupings and by asset-size categories.
6. Trade associations and individual companies often compute ratios for their industries and make them available to analysts.

The two most commonly used ratios for investigating liquidity are the *current ratio* and the *quick ratio* (or "acid test"). The current ratio is determined by dividing current assets by current liabilities and is a measure of the overall ability of the firm to meet its current obligations. A common rule of thumb is that current ratio should be about 2:1.

The quick ratio is determined by subtracting inventory from current assets and dividing the remainder by current liabilities. Since inventory is the least liquid current asset, the quick ratio deals with assets that are most readily available for meeting short-term (one-year) obligations. A common rule of thumb is that the quick ratio should be at least 1:1.

Asset Management Ratios Asset management ratios investigate how well the firm handles its assets. For marketing problems, two of the most useful asset management ratios are concerned with *inventory turnover* and *total asset utilization*. The inventory turnover ratio is determined by dividing sales by inventories.³ If the firm is not turning its inventory over as rapidly as other firms, it suggests that too much money is being tied up in unproductive or obsolete inventory. In addition, if the firm's turnover ratio is decreasing over time, it suggests that there may be a problem in the marketing plan, because inventory is not being sold as rapidly as it had been in the past. One problem with this ratio is that, since sales usually are recorded at market prices and inventory usually is recorded at cost, the ratio may overstate turnover. Thus, some analysts prefer to use cost of sales rather than sales in computing turnover. We will use cost of sales in our analysis.

A second useful asset management ratio is total asset utilization. It is calculated by dividing sales by total assets and is a measure of how productively the firm's assets have been used to generate sales. If this ratio is well below industry figures, it suggests that the firm's marketing strategies are less effective than those of competitors or that some unproductive assets need to be eliminated.

Profitability Ratios Profitability is a major goal of marketing and is an important measure of the quality of a firm's marketing strategies. Two key profitability ratios are *profit margin on sales* and *return on total assets*. Profit margin on sales is determined by dividing profit before tax by sales. Serious questions about the firm and marketing plan should be raised if profit margin on sales is declining across time or is well below other firms in the industry.

FIGURE 1 Balance Sheet and Income Statement for Ajax Home Computer Company

Assets		Liabilities and Stockholders' Equity	
Cash	\$ 30	Trade accounts payable.....	\$ 150
Marketable securities	40	Accrued	25
Accounts receivable	200	Notes payable	100
Inventory	430	Accrued income tax	40
Total current assets	700	Total current liabilities.....	315
Plant and equipment	1,000	Bonds.....	500
Land	500	Debentures	85
Other investments	200	Stockholders' equity.....	1,500
Total assets	<u>\$2,400</u>	Total liabilities and stockholders' equity.....	<u>\$2,400</u>

Ajax Home Computer Company Income Statement for the 12-Month Period Ending March 31, 2015 (in thousands)	
Sales	\$3,600
Cost of sales	
Labor and materials.....	2,000
Depreciation	200
Selling expenses.....	500
General and administrative expenses.....	80
Total cost.....	2,780
Net operating income	820
Less interest expense	
Interest on notes	20
Interest on debentures	200
Interest on bonds.....	300
Total interest	520
Profit before tax.....	300
Federal income tax (@40%)	120
Net profit after tax.....	<u>\$ 180</u>

Return on total assets is determined by dividing profit before tax by total assets. This ratio is the return on the investment for the entire firm.

2. Compute the Ratios

The next step in ratio analysis is to compute the ratios. Figure 1 presents the balance sheet and income statement for the Ajax Home Computer Company. These six ratios can be calculated from the Ajax balance sheet and income statement as follows:

Liquidity ratios:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{700}{315} = 2.2$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}} = \frac{270}{315} = 0.86$$

Asset management ratios:

$$\text{Inventory turnover} = \frac{\text{Cost of sales}}{\text{Inventory}} = \frac{2,780}{430} = 6.5$$

$$\text{Total asset utilization} = \frac{\text{Sales}}{\text{Total assets}} = \frac{3,600}{2,400} = 1.5$$

Profitability ratios:

$$\text{Profit margin on sales} = \frac{\text{Profit before tax}}{\text{Sales}} = \frac{300}{3,600} = 8.3\%$$

$$\text{Return on total assets} = \frac{\text{Profit before tax}}{\text{Total assets}} = \frac{300}{2,400} = 12.5\%$$

3. Compare the Ratios

While rules of thumb are useful for analyzing ratios, it cannot be overstated that comparison of ratios is always the preferred approach. The ratios computed for a firm can be compared in at least three ways. First, they can be compared over time to see if there are any favorable or unfavorable trends in the firm's financial position. Second, they can be compared with the ratios of other firms of similar size in the industry. Third, they can be compared with industry averages to get an overall idea of the firm's relative financial position in the industry.

Figure 2 provides a summary of the ratio analysis. The ratios computed for Ajax are presented along with the median ratios for firms of similar size in the industry and the industry median. The median is often reported in financial sources, rather than the mean, to avoid the strong effect of outliers.⁴

4. Check for Problems or Opportunities

The ratio comparison in Figure 2 suggests that Ajax is in reasonably good shape financially. The current ratio is above the industry figures, although the quick ratio is slightly below them. However, the high inventory turnover ratio suggests that the slightly low quick ratio should not be a problem, since inventory turns over relatively quickly. Total asset utilization is slightly below industry averages and should be monitored closely. This, coupled with the slightly lower return on total assets, suggests that some unproductive assets should be eliminated or that the production process needs to be made more efficient. While the problem could be ineffective marketing, the high profit margin on sales suggests that marketing effort is probably not the problem.

FIGURE 2
Ratio Comparison for
Ajax Home Computer
Company

	Ajax	Industry Firms Median (\$1–10 Million in Assets)	Overall Industry Median
Liquidity ratios			
Current ratio	2.2	1.8	1.8
Quick ratio	0.86	0.9	1.0
Asset management ratios			
Inventory turnover	6.5	3.2	2.8
Total assets utilization	1.5	1.7	1.6
Profitability ratios			
Profit margin	8.3%	6.7%	8.2%
Return on total assets	12.5%	15.0%	14.7%

SUMMARY

This section has focused on several aspects of financial analysis that are useful for marketing decision making. The first, breakeven analysis, is commonly used in marketing problem and case analysis. The second, net present value analysis, is quite useful for investigating the financial impact of marketing alternatives, such as new product introductions or other long-term strategic changes. The third, ratio analysis, is a useful tool sometimes overlooked in marketing problem solving. Performing a ratio analysis as a regular part of marketing problem and case analysis can increase the understanding of the firm and its problems and opportunities.

Additional Resources

Block, Stanley B., Geoffrey A. Hirt, and Bartley Danielsen. *Foundations of Financial Management*. Burr Ridge, IL: McGraw-Hill, 2011.

Brealey, Richard A., Stewart C. Myers, and Alan J. Marcus. *Fundamentals of Corporate Finance*. 7th ed. Burr Ridge, IL: McGraw-Hill, 2012.

Ross, Stephen A.; Randolph W. Westerfield; and Bradford D. Jordan. *Essentials of Corporate Finance*. 8th ed. Burr Ridge, IL: McGraw-Hill, 2014.