HARVARD | BUSINESS | SCHOOL

9-911-412
REV: JANUARY 28, 2011

Assessing a Company's Future Financial Health

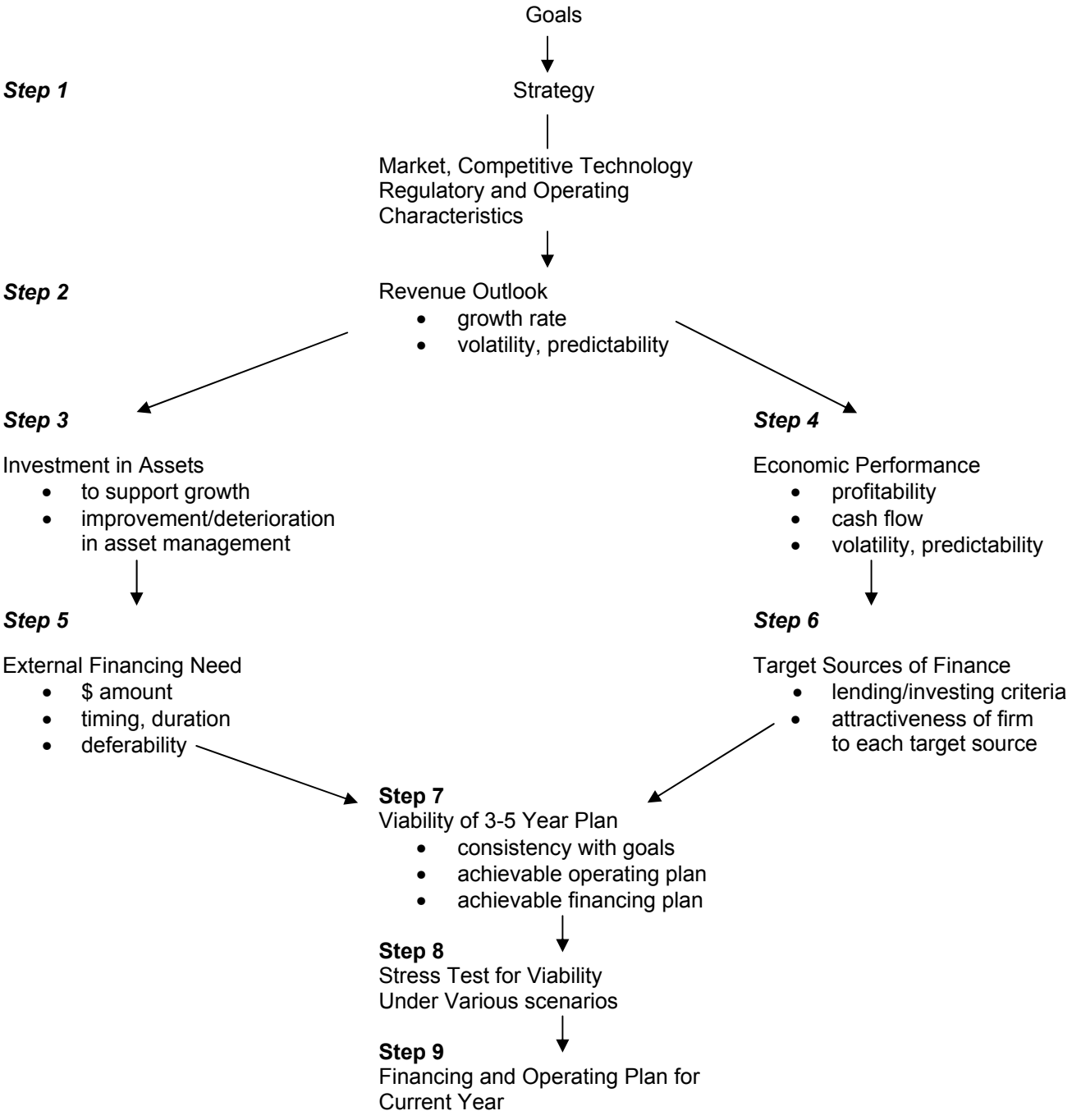
Assessing the long-term financial health of a company is an important task for management in its formulation of goals and strategies and for outsiders as they consider the extension of credit, long-term supplier agreements, or an investment in a company's equity. History abounds with examples of companies that embarked upon overly ambitious programs and subsequently discovered that their portfolios of programs could not be financed on acceptable terms. The outcome frequently was the abandonment of programs in mid-stream at considerable financial, organizational, and human cost.

It is the responsibility of management to *anticipate* future imbalance in the corporate financial system *before* its severity is reflected in the financials, and to consider corrective action before both time and money are exhausted. The avoidance of bankruptcy is an insufficient standard. Management must ensure the continuity of the flow of funds to all of its strategically important programs, even in periods of adversity.

Figure A provides a conceptualization of the corporate financial system, with a suggested step-by-step process to assess whether it will remain in balance over the ensuing 3-5 years. The remainder of this note discusses each of the steps in the process and then provides an exercise on the various financial measures that are useful as part of the analysis. The final section of the note demonstrates the relationship between a firm's strategy and operating characteristics, and its financial characteristics.

Professor Thomas Piper prepared the original version of this note, "Assessing a Firm's Future Financial Health," HBS No. 201-077, which is being replaced by this version prepared by the same author. This note was prepared as the basis for class discussion.

Figure A The Corporate Financial System



Steps 1, 2: Analysis of Fundamentals

The corporate financial system is driven by the goals, business unit choices and strategies, market conditions and the operating characteristics. The firm's strategy and sales growth in each of its business units will determine the investment in assets needed to support these strategies; and the effectiveness of the strategies, combined with the response of competitors and regulators, will

strongly influence the firm's competitive and profit performance, its need for external finance, and its access to the debt and equity markets. Clearly, many of these questions require information beyond that contained in a company's published financial reports.

Step 3: Investments to Support the Business Unit(s) Strategy(ies)

The business unit strategies inevitably require investments in accounts receivable, inventories, plant & equipment, and possibly, acquisitions. Step 3 of the process is an attempt to estimate the amount that will be tied up in each of the asset types by virtue of sales growth and the improvement/deterioration in asset management. An analyst can make a rough estimate by studying the past pattern of the collection period, the days of inventory, and plant & equipment as a percent of cost of goods sold; and then applying a "reasonable value" for each to the sales forecast or the forecast of cost of goods sold. Extrapolation of past performance assumes, of course, that the future underlying market, competitive and regulatory "drivers" will be unchanged from the conditions that influenced the historical performance.

Step 4: Future Profitability and Competitive Performance

Strong sustained profitability is an important determinant of (1) a firm's access to debt and/or equity finance on acceptable terms; (2) its ability to self-finance growth through the retention of earnings; (3) its capacity to place major bets on risky new technologies, markets, and/or products; and (4) the valuation of the company.

A reasonable starting point is to analyze the past pattern of profitability.

1. What have been the average level, trend and volatility of profitability?
2. Is the level of profitability sustainable, given the outlook for the market and for competitive and regulatory pressures?
3. Is the current level of profitability at the expense of future growth and/or profitability?
4. Has management initiated major profit improvement programs? Are they unique to the firm or are they industry-wide and may be reflected in lower prices rather than higher profitability?
5. Are there any "hidden" problems, such as suspiciously high levels or buildups of accounts receivable or inventory relative to sales, or a series of unusual transactions and/or accounting changes?

Step 5: Future External Financing Needs

Whether a company has a future external financing need depends on (1) its future sales growth; (2) the length of its cash cycle; and (3) the future level of profitability and profit retention. Rapid sales growth by a company with a long cash cycle (a long collection period + high inventories + high plant & equipment relative to sales) and low profitability/low profit retention is a recipe for an ever-increasing appetite for external finance, raised in the form of loans, debt issues, and/or sales of shares. Why? Because the rapid sales growth results in rapid growth of an already large level of total assets. The increase in total assets is offset partially by an increase in accounts payable and accrued expenses, and by a small increase in owners' equity. However, the financing gap is substantial. For example, the company portrayed in **Table A** requires $126 million of additional external finance by the end of year 2010 to finance the increase in total assets required to support 25% per year sales growth in a business that is fairly asset intensive.

Table A Assuming a 25% Increase in Sales ($ in millions)

Assets	**2009**		**2010**
Cash	$ 12	↑ 25%	$ 15
Accounts receivable	240	↑ 25%	300
Inventories	200	↑ 25%	250
Plant & equipment	400	↑ 25%	500
Total	$852		$1,065
Liabilities and Equity			
Accounts payable	$100	↑ 25%	$ 125
Accrued expenses	80	↑ 25%	100
Long-term debt	272	Unchanged	272
Owners' equity	400	footnote [a]	442
Total	$852		$ 939
External financing need	0		126
Total	$852		$1,065

[a] It is assumed (1) that the firm earns $60 million (a 15% return on beginning of year equity) and pays out $18 million as a cash dividend; and (2) that there is no required debt repayment in 2010.

If, however, the company reduced its sales growth to 5% (and total assets, accounts payable and accrued expenses increased accordingly by 5%), the need for additional external finance would drop from $126 million to $0.

High sales growth does *not* always result in a need for additional external finance. For example, a food retailer that extends no credit to customers, has only eight days of inventory, and does not own its warehouses and stores, can experience rapid sales growth and not have a need for additional external finance *provided* it is reasonably profitable. Because it has so few assets, the increase in total assets is largely offset by a corresponding, spontaneous increase in accounts payable and accrued expenses.

Step 6: Access to Target Sources of External Finance

Having estimated the future financing need, management must identify the target sources (e.g., banks, insurance companies, public debt markets, public equity market) and establish financial policies that will ensure access on acceptable terms.

1. How sound is the firm's financial structure, given its level of profitability and cash flow, its level of business risk, and its future need for finance?

2. How will the firm service its debt? To what extent is it counting on refinancing with a debt or equity issue?

3. Does the firm have assured access on acceptable terms to the equity markets? How many shares could be sold and at what price in "good times"? In a period of adversity?

4. What criteria are used by each of the firm's target sources of finance to determine whether finance will be provided and, if so, on what terms?

The evaluation of a firm's financial structure can vary substantially depending on the perspective of the lender/investor. A bank may consider a seasonal credit a very safe bet. Considerable shrinkage can occur in the conversion of inventory into sales and collections without preventing repayment of the loan. In contrast, an investor in the firm's 20-year bonds is counting on its sustained health and profitability over a 20-year period.

Step 7: Viability of the 3-5 Year Plan

1. Is the operating plan on which the financial forecasts are based achievable?
2. Will the strategic, competitive, and financial goals be achieved?
3. Will the resources required by the plan be available?
4. How will the firm's competitive, organizational, and financial health at the end of the 3-5 years compare with its condition at the outset?

Step 8: Stress Test under Scenarios of Adversity

Financing plans typically work well if the assumptions on which they are based turn out to be accurate. However, this is an insufficient test in situations marked by volatile and unpredictable conditions. The test of the soundness of a 3-5 year plan is whether the continuity of the flow of funds to all strategically important programs can be maintained under various scenarios of adversity for the firm and/or the capital markets—or at least be maintained as well as your competitors are able to maintain the funding of their programs.

Step 9: Current Financing Plan

How should the firm meet its financing needs in the current year? How should it balance the benefits of future financing flexibility (by selling equity now) versus the temptation to delay the sale of equity by financing with debt now, in hopes of realizing a higher price in the future?

The next section of this note is designed to provide familiarity with the financial measures that can be useful in understanding the past performance of a company. Extrapolation of the past performance, if done thoughtfully, can provide valuable insights as to the future health and balance of the corporate financial system. Historical analysis can also identify possible opportunities for improved asset management or margin improvement, as well as provide an important, albeit incomplete, basis for evaluating the attractiveness of a business and/or the effectiveness of a management team.

Financial Ratios and Financial Analysis

The three primary sources of financial data for a business entity are the income statement, the balance sheet, and the statement of cash flows. The income statement summarizes revenues and expenses over a period of time. The balance sheet is the list of what a company owns (its assets), what it owes (its liabilities), and what has been invested by the owners (owners' equity) at a specific point in time. The statement of cash flow categorizes all cash transactions during a specific period of time in terms of cash flows generated or used for operating activities, investing activities, and financing activities.

The focus of this section is on performance measures based on the income statements and balance sheets of SciTronics—a medical device company. The measures can be grouped by type: (1)

profitability measures, (2) activity (asset management) measures, (3) leverage and liquidity measures. Please refer to the financial statements of SciTronics as shown in **Exhibits 1** and **2** at the end of the note. As you work through the questions that follow, please also consider three broad questions:

1. What is your assessment of the performance of SciTronics during the 2005-2008 period?
2. Has its financial strength and its access to external sources of finance improved or weakened?
3. What are the 2-3 most important questions you would ask management as the result of your analysis?

Sales Growth

Sales growth is an important driver of the need to invest in various type assets and of the company's value. It also provides some indication of the effectiveness of a firm's strategy and product development activities, and of customer acceptance of a firm's products and services.

1. During the four-year period ended December 31, 2008, SciTronics' sales grew at a _____% compound rate. There were no acquisition or divestitures.

Profitability Ratio: How Profitable Is the Company?

Profitability is a necessity over the long-run. It strongly influences (1) the company's access to debt; (2) the valuation of the company's common stock; (3) the willingness of management to issue stock; and (4) the capacity to self-finance. One measure of profitability of a business is its return on sales, measured by dividing net income by net sales.

1. SciTronics' profit as a percentage of sales in 2008 was _____ %.
2. This represented an **increase/decrease** from _____% in 2005.

Management and investors often are more interested in the return earned on the funds invested than in the level of profits as a percentage of sales. Companies operating in businesses requiring very little investment in assets often have low profit margins but earn very attractive returns on invested funds. Conversely, there are numerous examples of companies in very capital-intensive businesses that earn miserably low returns on invested funds, despite seemingly attractive profit margins.

Therefore, it is useful to examine the return earned on the funds provided by the shareholders and by the "investors" in the company's interest-bearing debt. To increase the comparability across companies, it is useful to use EBIAT (earnings before interest but after taxes) as the measure of return. The use of EBIAT as the measure of return also allows the analyst to compare the return on invested capital (calculated before the deduction of interest expense), with the company's estimated cost of capital to determine the long-term adequacy of the company's profitability. EBIAT is calculated by multiplying EBIT (earnings before interest and taxes) times (1—the average tax rate).

$$\frac{\text{EBIT x } (1 - \text{tax rate})}{\text{Owners}' \text{equity plus interest bearing debt}}$$

3. SciTronics had a total of $_____ of capital at year-end 2008 and earned before interest but after taxes (EBIAT) $_____ during 2008. Its return on capital was _____% in 2008 which represented an **increase/decrease** from the _____% earned in 2005.

From the viewpoint of the shareholders, an equally important figure is the company's return on equity. Return on equity is calculated by dividing profit after tax by the owners' equity.

$$\frac{\text{Profit after taxes}}{\text{Owners}'\text{equity}} = \text{Return on equity}$$

Return on equity indicates how profitably the company is utilizing shareholders' funds.

4. SciTronics had $_____ of owners' equity and earned $_____ after taxes in 2008. Its return on equity was _____% an **improvement/deterioration** from the _____% earned in 2005.

Activity Ratios: How Well Does the Company Employs Its Assets?

The second basic type of financial ratio is the activity ratio. Activity ratios indicate how well a company employs its assets. Ineffective utilization of assets results in the need for more finance, unnecessary interest costs, and a correspondingly lower return on capital employed. Furthermore, low activity ratios or deterioration in the activity ratios may indicate uncollectible accounts receivable or obsolete inventory or equipment.

Total asset turnover measures the company's effectiveness in utilizing its total assets and is calculated by dividing total assets into sales.

$$\frac{\text{Net sales}}{\text{Total assets}}$$

1. Total asset turnover for SciTronics in 2008 can be calculated by dividing $_____ into $_____. The turnover **improved/deteriorated** from _____ times in 2005 to _____ times in 2008.

It is useful to examine the turnover ratios for each type of asset, as the use of total assets may hide important problems in one of the specific asset categories. One important category is accounts receivables. The average collection period measures the number of days that the company must wait on average between the time of sale and the time when it is paid. The average collection period is calculated in two steps. First, divide annual credit sales by 365 days to determine average sales per day:

$$\frac{\text{Net credit sales}}{\text{365 days}}$$

Then, divide the accounts receivable by average sales per day to determine the number of days of sales that are still unpaid:

$$\frac{\text{Accounts receivable}}{\text{Credit sales per day}}$$

2. SciTronics had $_____ invested in accounts receivables at year-end 2008. Its average sales per day were $_____ during 2008 and its average collection period was _____days. This represented an **improvement/deterioration** from the average collection period of _____ days in 2005.

A third activity ratio is the inventory turnover ratio, which indicates the effectiveness with which the company is employing inventory. Since inventory is recorded on the balance sheet at cost (not at

its sales value), it is advisable to use cost of goods sold as the measure of activity. The inventory turnover figure is calculated by dividing cost of goods sold by inventory:

$$\frac{\text{Cost of goods sold}}{\text{Inventory}}$$

3. SciTronics apparently needed $_____ of inventory at year-end 2008 to support its operations during 2008. Its activity during 2008 as measured by the cost of goods sold was $_____. It therefore had an inventory turnover of _____ times. This represented an **improvement/deterioration** from _____ times in 2005.

An alternative measure of inventory management is days of inventory, which can be calculated by dividing cost of goods sold by 365 days to determine average cost of goods sold per day. Days of inventory is calculated by dividing total inventory by cost of goods sold per day.

A fourth and final activity ratio is the fixed asset turnover ratio which measures the effectiveness of the company in utilizing its plant and equipment:

$$\frac{\text{Net sales}}{\text{Net fixed assets}}$$

4. SciTronics had net fixed assets of $_____ and sales of $_____ in 2008. Its fixed asset turnover ratio in 2008 was _____ times, an **improvement/deterioration** from _____ times in 2005.

Leverage Ratios: How Soundly is the Company Financed?

There are a number of balance sheet measures of financial leverage. The various leverage ratios measure the relationship of funds supplied by creditors to the funds supplied by owners. The use of borrowed funds by reasonably profitable companies will improve the return on equity. However, it increases the riskiness of the business and the riskiness of the returns to the stockholders, and can result in financial distress if used in excessive amounts.

The ratio of total assets divided by owners' equity is an indirect measure of leverage. A ratio, for example, of $6 of assets for each $1 of owner's equity indicates that $6 of assets is financed by $1 of owners' equity and $5 of liabilities.

1. SciTronics' ratio of total assets divided by owners' equity **increased/decreased** from _____ at year –end 2005 to _____ at year-end 2008.

The same "story" of increasing financial leverage is told by dividing total liabilities by total assets.

2. At year-end 2008, SciTronics' total liabilities were _____% of its total assets, which compares with _____% in 2005.

Lenders—especially long-term lenders—want reasonable assurance that the company will be able to repay the loan in the future. They are concerned with the relationship between a company's debt and its total economic value. This ratio is called the total debt ratio at market.

$$\frac{\text{Total liabilities}}{\text{Total liabilities} + \text{market value of the equity}}$$

The market value of the equity is calculated by multiplying the number of shares of common stock outstanding times the market price per share.

3. The market value of SciTronics' equity was $175,000,000 at December 31, 2008. The total debt ratio at market was _____.

A fourth ratio that relates the level of debt to economic value and performance is the times interest earned ratio. This ratio relates earnings before interest and taxes—a measure of profitability and of long-term viability—to the interest expense—a measure of the level of debt.

$$\frac{\text{Earnings before interest and taxes}}{\text{Interest expense}}$$

4. SciTronics' earnings before interest and taxes (operating income) were $_____ in 2008 and its interest charges were $_____. Its times interest earned was _____ times. This represented an **improvement/deterioration** from the 2005 level of _____ times.

A fifth and final leverage ratio is the number of days of payables. This ratio measures the average number of days that the company is taking to pay its suppliers of raw materials and components. It is calculated by dividing annual purchases by 365 days to determine average purchases per day:

$$\frac{\text{Annual purchases}}{\text{365 days}}$$

Accounts payable are then divided by average purchases per day:

$$\frac{\text{Accounts payable}}{\text{Average purchases per day}}$$

to determine the number of days purchases that are still unpaid.

It is often difficult to determine the purchases of a firm. Instead, the income statement shows cost of goods sold, a figure that includes not only raw materials but also labor and overhead. Thus, it often is only possible to gain a rough idea as to whether or not a firm is becoming more or less dependent on its suppliers for finance. This can be done by tracking the pattern over time of accounts payable as a percent of cost of goods sold.

$$\frac{\text{Accounts payable}}{\text{Cost of goods sold}}$$

5. SciTronics owed its suppliers $_____ at year end 2008. This represented _____% of cost of goods sold and was an **increase/decrease** from _____% at year end 2005. The company appears to be **more/less** prompt in paying its suppliers in 2008 than it was in 2005.

6. The financial riskiness of SciTronics **increased/decreased** between 2005 and 2008.

Liquidity Ratios: How Liquid is the Company?

The fourth basic type of financial ratio is the liquidity ratio. These ratios measure a company's ability to meet financial obligations as they become current. The current ratio, defined as current assets divided by current liabilities, assumes that current assets are much more readily and certainly convertible into cash than other assets. It relates these fairly liquid assets to claims that are due within one year—the current liabilities.

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

1. SciTronics held $_____ of current assets at year-end 2008 and owed $_____ to creditors due to be paid within one year. Its current ratio was _____, an **increase/decrease** from the ratio of _____ at year-end 2005.

The quick ratio or acid test is similar to the current ratio but excludes inventory from the current assets:

$$\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

Inventory is excluded because it is often difficult to convert into cash (at least at book value) if the company is struck by adversity.

2. The quick ratio for SciTronics at year-end 2008 was _____, an **increase/decrease** from the ratio of _____ at year-end 2005.

Profitability Revisited

Management can "improve" its return on equity by improving its return on sales and/or its asset turnover and/or by increasing its financial leverage as measured by total assets divided by owners' equity.

$$\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \text{ x } \frac{\text{Sales}}{\text{Total Assets}} \text{ x } \frac{\text{Total Assets}}{\text{Owners'Equity}}$$

Each method of "improvement" differs operationally and in terms of risk.

1. The improvement in SciTronics' return on equity from 8.2% in 2005 to 18.7% in 2008 resulted from an **increase/decrease** in its return on sales; and an **increase/decrease** in its asset turnover, and an **increase/decrease** in its financial leverage.

A Warning

The calculated ratios are no more valid than the financial statements from which they are derived. The quality of the financial statements should be assessed and appropriate adjustments made, before any ratios are calculated. Particular attention should be placed on assessing the reasonableness of the accounting choices and assumptions embedded in the financial statements.

The Case of the Unidentified Industries

The preceding exercise suggests a series of questions that may be helpful in assessing a company's future financial health. It also describes several ratios that are useful in answering some of the questions, especially if the historical trend in these ratios can be reasonably extrapolated.

However, it is also important to compare the actual absolute value with some standard to determine whether the company is performing well. Unfortunately, there is no single current ratio, inventory turnover, or debt ratio that is appropriate to all industries. The operating and competitive characteristics of the company's industry greatly influence its investment in the various types of assets, the riskiness of these investments, and the financial structure of its balance sheet.

Try to match the five following types of companies with their corresponding balance sheets and financial ratios as shown in **Exhibit 3**.

1. Electric utility
2. Japanese automobile manufacturer
3. Discount general merchandise retailer
4. Automated test equipment/systems company
5. Upscale apparel retailer

In doing the exercise, consider the operating and competitive characteristics of the industry and their implications for (1) the collection period; (2) inventory turnover; (3) the amount of plant and equipment; (4) the profit margins and profitability; and (5) the appropriate financing structure. Then identify which one of the five sets of balance sheets and financial ratios best match your expectations, given the difficult economic conditions in 2009.

Exhibit 1 SciTronics, Inc. Consolidated Income Statements 2005-2008
($ in thousands)

	2004	2005	2006	2007	2008
Sales	$115,000	$147,000	171,000	$205,000	$244,000
Cost of goods sold		43,000	50,000	63,000	74,000
Gross margin		104,000	121,000	142,000	170,000
Research & development		15,000	20,000	26,000	28,000
Sell, general & administrative		79,000	92,000	106,000	116,000
Operating income		10,000	9,000	10,000	26,000
Interest expense		1,000	2,000	2,000	2,000
Profit before tax		9,000	7,000	8,000	24,000
Income tax		4,000	2,000	3,000	10,000
Net income		$ 5,000	$ 5,000	$ 5,000	$14,000

Exhibit 2 SciTronics, Inc. Consolidated Balance Sheet at December 31, 2005-2008
($ in thousands)

	2005	2006	2007	2008
Cash	$ 9,000	$ 10,000	$ 15,000	$ 18,000
Accounts receivable	42,000	53,000	61,000	66,000
Inventories	21,000	28,000	30,000	29,000
Other current assets	10,000	13,000	21,000	20,000
Total current assets	82,000	104,000	127,000	133,000
Net property & equipment	9,000	12,000	13,000	18,000
Other	2,000	2,000	6,000	8,000
Total assets	$93,000	$118,000	$146,000	$159,000
Notes payable	$ 3,000	$ 18,000	$ 8,000	$ 10,000
Accounts payable	5,000	6,000	7,000	6,000
Accrued expenses	10,000	13,000	21,000	28,000
Other current liabilities	3,000	3,000	4,000	4,000
Total current liabilities	21,000	40,000	40,000	48,000
Long-term senior debt	10,000	9,000	8,000	7,000
Subordinated convertible debt	--	--	20,000	20,000
Other liabilities	1,000	3,000	7,000	9,000
Owners' equity	61,000	66,000	71,000	85,000
Treasury stock	--	--	--	(10,000)
Owners' equity	61,000	66,000	71,000	75,000
Total liabilities and equity	$93,000	$118,000	$146,000	$159,000

Exhibit 3 Unidentified Industries

	A	B	C	D	E
Balance Sheet Percentages					
Cash	1.5%	14.4%	12.1%	13.3%	11.0%
Receivables	4.6	3.8	30.9	39.8	11.8
Inventories	1.8	24.6	13.7	4.7	16.7
Other current assets	2.0	4.3	5.0	3.8	10.0
Property and equipment (net)	74.5	49.6	34.1	22.1	20.3
Other assets	15.6	3.4	4.3	16.3	30.2
Total assets	100%	100%	100%	100%	100%
Notes payable	5.3%	0.4%	5.4%	18.2%	1.4%
Accounts payable	2.1	24.8	11.0	8.3	8.8
Other current liabilities	5.9	17.0	14.2	8.7	16.5
Long-term debt	33.6	10.0	34.3	23.1	21.7
Other liabilities	26.3	2.2	11.2	5.6	2.0
Owners' equity	26.8	45.6	23.9	36.1	49.6
Total	100%	100%	100%	100%	100%
Selected Ratios					
Net profit/net sales	10.3%	1.5%	5.1%	1.3%	(5.8%)
Return on capital	6.8%	9.2%	12.6%	0.9%	(3.1%)
Return on equity	12.5%	10.8%	28.1%	2.2%	(7.6%)
Sales/total assets	.32	3.25	1.31	.63	.65
Collection period (days)	52	4	86	232	43
Days of inventory	43	32	62	31	147
Sales/net property & equipment	.43	6.7	3.8	2.9	3.6
Total assets/equity	3.73	2.19	4.19	2.79	2.01
Total liabilities/total assets	.73	.54	.76	.66	.50
Interest-bearing debt/total capital	59%	19%	62%	53%	32%
Times interest earned	3.2	16	6.0	4.4	NM
Current assets/current liabilities	.67	1.11	2.01	1.22	1.85