

third edition

Financial Analysis

A Programmed Approach

Neil

Financial Analysis: A Programmed Approach

3rd Edition

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**Reston Publishing Company, Inc.
A Prentice-Hall Company
Reston, Virginia**

Library of Congress Cataloging in Publication Data

Seitz, Neil
Financial analysis.

1. Business enterprises—Finance—Programmed
instruction. I. Title
HC4026.S386 1984 658.1'51 83-17649
ISBN 0-8359-1994-3

© 1976, 1979, 1984 by
Reston Publishing Company, Inc.
A Prentice-Hall Company
Reston, Virginia

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10 9 8 7 6 5 4 3 2 1

Printed in the United States of America

Introduction

This book is directed primarily to the needs of a manager in a nonfinancial company, such as an automobile manufacturer or a clothing store. Many of the topics discussed, however, are applicable to other types of financial work such as security analysis, commercial loan analysis, and management of nonprofit organizations.

The financial problems faced by widely diverse types of nonfinancial companies are actually quite similar. On the one hand, it is necessary to decide how the money needed to operate the business is to be raised. On the other hand, it is necessary to decide where in the firm money is to be invested. The right financial decisions will contribute to the firm's achievement of its goals.

People at all levels and locations in the firm are involved in financial decisions. All managers are concerned with profitability. All divisions of the firm are involved in capital investment proposals and capital investment decisions. All divisions are also involved in the analysis of their past operating results and the projection of their future operating results. Therefore, the techniques of financial analysis are valuable not only to the financial manager, but to managers at all levels of the business organization.

What are the goals toward which financial management strives? The owners of a corporation are the equity holders. One of the major goals of the corporation is the furthering of the owners' interest. The owners' interest has been satisfied if decisions are made so as to maximize the value of the firm. Though there are important exceptions, the actions that maximize the value of the firm will generally benefit the managers and other employees as well.

There are certain specific guidelines managers follow in pursuing the goal of value maximization. First, they attempt to raise funds for the firm at the lowest cost possible, given the riskiness of the firm's asset structure. Second, they attempt to guide the use of these funds within the firm to the most profitable investments, consistent with risk considerations. (Investors, managers, and employees generally dislike risk and demand higher compensation in exchange for accepting risk.) Consequently, in pursuing the

goal of value maximization, managers attempt to make the optimal trade-off between risk and return.

This book focuses on tools of financial analysis used for practical business decisions. This is not a book on finance theory; proofs are not given, and esoteric topics with little practical application are avoided. It also lacks materials describing financial institutions. Instead, this book concentrates on the techniques that will aid in analyzing financial data and making financial decisions.

The first chapters of this text cover the methods of analyzing past financial results and forecasting the results of future operations. These are basic tools required for decision making. Leverage, or the relationship between fixed and variable costs, is covered next. Leverage affects both the profitability and risk of the firm. Following this, analysis techniques used in the management of working capital—current assets and current liabilities—are covered. The next four chapters, on time value of money value, and capital budgeting, are the basis for decisions relative to the fixed assets of the firm. The final two chapters cover the estimation of the cost to the firm of funds, and analysis of alternate financing methods.

How To Use This Book

Place a card over the answers at the bottom of each page before beginning. You will be asked to respond at numerous points. After each response, uncover the correct answer and check it against your response. Do this after each response. Do not wait until the end of a frame to check your answers. If your response was not correct, try to understand the correct answer before continuing. The most frequently missed questions are followed by an explanation of the correct answer and additional exercises on the same topic.

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1

Financial Statement Analysis

The basic data with which the financial decision maker must work are found in the financial statements. The ability to understand, interpret, and use this information is essential for sound financial decision making. The financial statements examined here are the income statement and the balance sheet.

There are many uses of financial statement analysis. The analyst may, for example, be a potential trade creditor, a bank officer considering a short-term loan, a long-term creditor such as a bondholder, a manager, or an owner of the company. Each user of financial statements is interested in different types of information. The short-term creditor is interested in the ability of the company to repay the debt within a short period of time. The long-term creditor, on the other hand, is interested in the ability of the company to generate the necessary profits for repayment over a number of years. The creditor is also interested in his protection in the case of default. The owner is interested in both the profitability and the safety of the investment. The manager is interested in the profitability of the company, the efficiency with which assets are used, and the risk to which the company is exposed. Each uses the financial statements to discern the condition and trend of the company relative to his area of interest.

Just as there are many different users of financial statements, there are various methods of analysis. In this treatment, the method of ratio analysis will be used. Suppose that profits for company A are 50% greater than for company B. Should company A be proud of this accomplishment? To answer this question, you must have some additional information. Suppose, for example, that company A has twice the sales and three times the total assets of company B. The owners would not be interested in profit alone, but in profit relative to other things, such as assets committed or shares of common stock outstanding. In other words, they would be interested in the *ratio* of profit to something else. Likewise, the ratio of debt to total assets frequently

means more than the simple dollar amount of debt. Analysts frequently compare ratios to those of a similar company or those of the same company for previous years.

There are various categories of ratios. *Liquidity ratios* are used to measure the ability to make payments that are due in the near future. *Activity ratios* are used to evaluate the efficiency of asset usage. *Leverage ratios* help in evaluating the use of debt financing, and *profitability ratios* are used to evaluate the degree to which other activities result in profits. *Market ratios* measure the reactions of investors to the company's performance. By using these various types of ratios singly or in combination, you will be able to develop an understanding of the strengths and weaknesses of the company that are of particular interest to you.

In this chapter, you will learn how to compute and interpret 14 widely used ratios. You will learn to use these ratios in combination to evaluate a company and spot potential problems.

A. Introduction to Ratios

1. Ratios are used to make information comparable between financial statements. A ratio can be compared to figures for another company, an industry average, or the figures for the same company for previous years.
2. As pointed out in the introduction to this chapter, there are five main categories of ratios:
 - _____ ratios are used to measure the ability to meet maturing obligations in the near future.
 - _____ ratios are used to evaluate the use of debt financing.
 - _____ ratios are used to evaluate the efficiency of asset usage.
 - _____ ratios are used to evaluate the degree to which the activities of the company result in profits.
 - _____ ratios measure the reactions of investors to the company's performance.

Answers:

2. Liquidity
Leverage

Activity
Profitability

Market

3. In the following sections, the five categories of ratios will be discussed in sequence. The use of combinations of ratios to evaluate a company will also be covered. The 1981 through 1983 financial statements for Office Supply Corporation appear on page 4. You will need to refer to these frequently throughout the chapter.

B. Liquidity Ratios

4. _____ ratios are used to measure the ability of the company to meet maturing obligations in the near future. The two main liquidity ratios are the current ratio and the acid test ratio.
5. The current ratio is defined as current assets divided by current liabilities. The current ratio is used as an indicator of the ability of the company to meet cash obligations in the near future. It indicates the extent to which current liabilities are covered by assets that are most rapidly liquidated, or converted to cash. The 1983 current ratio for Office Supply was

$$\text{Current Ratios} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{90}{40} = \underline{\underline{\quad\quad\quad}}$$

6. The 1982 current ratio for Office Supply was _____.
Skip to Frame 8 if you got the correct answer.
7. Current assets for 1982 were \$_____ and current liabilities were \$_____. Using the formula in Frame 5, the current ratio for 1982 was $50/30 = \underline{\quad\quad}$. The 1981 current ratio was _____.
8. Generally, the higher the current ratio the more liquid the company. Office Supply's 1983 current ratio was higher/lower than its 1982 current ratio. Therefore, it appears to be more/less liquid at the end of 1983, compared to 1982.
9. The current ratio recognizes all current assets. The primary current assets are cash, marketable securities, accounts receivable, and inventory. Of these items, inventory would be the most difficult to

Answers:

- | | | |
|---------------------|---------------|-----------|
| 4. Liquidity | 7. \$50 | 8. higher |
| 5. 2.25 | \$30 | more |
| | 1.67 | |
| 6. $50 / 30 = 1.67$ | $40/20 = 2.0$ | |

Office Supply Corporation
Income Statements
Years Ending December 31

	1981	1982	1983
Sales	\$ 80	\$100	\$120
Cost of Goods Sold	<u>40</u>	<u>50</u>	<u>60</u>
Gross Profit	40	50	60
Depreciation	5	6	8
Overhead Expense	10	12	14
Sales Expense	<u>10</u>	<u>12</u>	<u>14</u>
Net Operating Income	15	20	24
Interest	<u>1</u>	<u>2</u>	<u>6</u>
Earnings Before Tax	14	18	18
Tax	<u>7</u>	<u>9</u>	<u>9</u>
Net Income	<u>\$ 7</u>	<u>\$ 9</u>	<u>\$ 9</u>
Earnings Per Share	<u>\$.70</u>	<u>\$.90</u>	<u>\$.90</u>

Office Supply Corporation
Balance Sheets
December 31

<i>Assets</i>	1981	1982	1983
Cash	\$ 8	\$ 10	\$ 10
Accounts Receivable	16	20	50
Inventory	<u>16</u>	<u>20</u>	<u>30</u>
Total Current Assets	40	50	90
Fixed Assets (Net of Depreciation)	<u>40</u>	<u>50</u>	<u>60</u>
Total Assets	<u>\$ 80</u>	<u>\$100</u>	<u>\$150</u>

Liabilities and net worth

Accounts Payable	\$ 10	\$ 15	\$ 20
Miscellaneous Accruals	<u>10</u>	<u>15</u>	<u>20</u>
Total Current Liabilities	20	30	40
Long-Term Debt	10	20	60
Common Stock	10	10	10
Paid-in Capital	10	10	10
Retained Earnings	<u>30</u>	<u>30</u>	<u>30</u>
Total Liabilities and Net Worth	<u>\$ 80</u>	<u>\$100</u>	<u>\$150</u>

convert to cash quickly during a business downturn. For this reason, the *acid test* ratio (also called the *quick* ratio) is frequently used in conjunction with the current ratio. The acid test ratio considers current assets other than inventory. For 1983, Office Supply's acid test ratio was

$$\text{Acid Test Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} = \frac{90 - 30}{40} = \underline{\quad}$$

10. The 1982 acid test ratio was .
Skip to Frame 12 if you got the correct answer.
11. Refer again to the formula for the acid test ratio in Frame 9. Current assets for 1982 were \$ and inventory was \$. Current liabilities were \$. Therefore, the acid test ratio was $(50 - 20) \div 30 = \underline{\quad}$. For 1981, the acid test ratio was .
12. A higher acid test ratio indicates that the company is more liquid, or is in a better position to meet its current obligations. The acid test ratio would indicate that Office Supply was *more/less* liquid in 1983 than in 1982.
13. The current ratio and the acid test ratio are used in combination as indicators of , or ability to meet maturing obligations in the near future. Higher current ratios and acid test ratios indicate *greater/less* liquidity.

C. Leverage Ratios

14. The sources of funds available to a company are divided between debt and equity. Debt, of course, is a fixed cost source of funds. If the return on funds employed in the business is greater than the cost, the difference accrues to the equity holders. Risk, however, is increased because the company must meet debt obligations. The leverage ratios used here are the *debt ratio* (also called the debt to total assets ratio), *times interest earned*, and *fixed charge coverage*.

Answers:

- | | | |
|----------------------------|------------------------|---------------|
| 9. $60/40 = 1.5$ | 11. \$50 | 12. more |
| | \$20 | |
| 10. $(50 - 20) / 30 = 1.0$ | \$30 | 13. liquidity |
| | 1.0 | greater |
| | $(40 - 16) / 20 = 1.2$ | |

15. The debt ratio is defined as total debt divided by total assets. It indicates the percent of assets that are financed through debt. For 1983, Office Supply's debt ratio was

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}} = \frac{100^*}{150} = \underline{\underline{.67}}$$

*Current liabilities are part of total debt.

16. The 1982 debt ratio was .33.
Skip to Frame 18 if you got the correct answer.
17. Refer again to the formula for the debt ratio in Frame 15. Once again, total debt includes long-term debt and current liabilities. Total debt for Office Supply in 1982 was \$30 + \$20 = \$50 and total assets were \$100. The debt ratio, therefore, was $50 / 100 =$.5. The debt ratio for 1981 was .33.
18. The debt ratio indicates what percent of the assets is financed through debt. In 1983, 67% of the assets were financed with debt compared to 50% in 1982. Office Supply, therefore, used more / less financial leverage in 1983 than in 1982.
19. The *times interest earned* ratio is used as an indication of the ability to meet interest payments. It is defined as (Earnings Before Tax + Interest) ÷ Interest. In 1983, the times interest earned for Office Supply was

$$\begin{aligned} \text{Times Interest Earned} &= \frac{\text{Earnings Before Tax} + \text{Interest}}{\text{Interest}} \\ &= \frac{18 + 6}{6} = \underline{\underline{4}} \end{aligned}$$

20. The times interest earned ratio for 1982 was 2.
Skip to Frame 22 if you got the correct answer.

Answers:

- | | | |
|--------------------------|---|---|
| 15. .67 | 17. \$50,
\$100
.5
(20 + 10) / 80 = .375 | 18. 50%
more
19. 4
20. (18 + 2) / 2 = 10 |
| 16. (30 + 20) / 100 = .5 | | |

21. Earnings before tax for 1982 were \$ 12 and interest was \$ 2, so profit before tax and interest was $\$18 + \$2 = \$20$. Times interest earned, therefore, was $20 / 2 = 10$. Times interest earned for 1981 was 14 + 1 = 15.
22. The greater the times interest earned, the greater the decline in profit the company could take and still meet its interest payments. Times interest earned *increased* / decreased from 1982 to 1983. Therefore, Office Supply has become more / *less* vulnerable to the effects of a profit decline.
23. Interest is only one type of fixed obligation that the firm may undertake in the process of financing its assets. The company may also take on lease obligations and contractual debt repayment schedules. The fixed charge coverage ratio is used as a more complete measure of ability to meet these obligations:

Fixed Charge Coverage =

$$\frac{\text{Earnings Before Tax} + \text{Depreciation} + \text{Interest} + \text{Lease Payment}}{\text{Interest} + \text{Lease Payment} + \text{Debt Repayment} / (1 - \text{Tax Rate})}$$

24. Office Supply had lease payments of \$2 in 1983. These payments were included in overhead expenses. Taxes were 50% of earnings before tax, so the tax rate was apparently 50%. Debt repayment was \$6. The fixed charge coverage was

$$\text{Fixed Charge Coverage} = \frac{18 + 8 + 6 + 2}{6 + 2 + 6 / (1 - .5)} = \underline{\underline{1.7}}$$

25. Lease payments were also \$2 in 1982 and required debt repayment was \$3 in 1982. For 1982, the fixed charge coverage was 2.8 + 10.
Skip to Frame 27 if you got the correct answer.

Answers:

21. \$18
\$ 2
\$20
10
 $(14 + 1) / 1 = 15$

22. decreased
more

24. $34 / 20 = 1.7$
25. 2.8