

RATIO ANALYSIS OF FINANCIAL STATEMENTS

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PREFACE

The twentieth century has been witness to a phenomenal rate of growth in accounting. To a large degree this growth can be attributed to large scale production, a characteristic of this complex industrial era. More accountants than ever before are engaged in the tasks of recording, classifying, summarizing and interpreting financial data. Financial statements are the end products of an accountant's task.

For every accountant employed in the construction of a statement, there are scores of people interested in the analysis and use of such statements, particularly the balance sheet and income statements. These persons include creditors, bankers, investors, executives and the general public.

A financial statement which has been carefully prepared must be analyzed and interpreted in the same manner if worthwhile results are to be obtained. Along with the rapid growth of accounting, there has been a continual improvement in the methods used in financial statement analysis. These methods normally include the formulation of significant relationships existing between the many parts of a statement.

This writing will be concerned with the presentation and explanation of significant ratios commonly used in the analysis of the balance sheet and income statements. These ratios may be used to indicate or to infer the financial condition of a company. Emphasis will be placed on the industrial corporation. Prior to the presentation of ratios, a brief description of the general nature of the statement to be analyzed will be given. However,

there will be no attempt to analyze the statement in its entirety; only the essential component parts will be scrutinized.

It must be realized that not all types of analysis discussed herein will be applicable to each line of industry or to all financial statements. Two apparent reasons for this are: (1.) there is a great variety in financial statements, and (2.) the detailed information needed for complete analysis is not always available.

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CHAPTER I
INTRODUCTION

The elements of accounting are as old as civilization itself. Ancient Egyptians and Mesopotamians kept business records on baked clay tablets. Many thousands of years have passed since then, but it is doubtful that all these years attributed as much to the development of accounting as have the last one-hundred years. Published financial statements were not available during the early years of the nineteenth century. There was little need for, or use of, such statements. Commercial and industrial activity was carried on largely by the proprietorship and partnership forms of organization. Credit was extended on the basis of letters of reference and recommendation. Rarely ever was financial information made a basis for credit extension.¹

As business was expanded it began to lose its personal nature and the old methods of extending credit became obsolete. This was the basic reason for the need and immediate success of early credit organizations such as the Mercantile Agency, organized in 1841, and the Bradstreet Company of 1849.² These organizations proceeded to make independent credit investigations. Financial statements became important instruments upon which credit was granted.

1 Roy A. Foulke, Practical Financial Statement Analysis, Second Edition, p. 5.

2 These two companies have now been consolidated into the Dun and Bradstreet, Inc., Ibid., p. 6.

During the second half of the nineteenth century corporations assumed a commanding position in most business activities. Individuals invested large portions of their savings in stocks of corporate banks, railroads, utilities, and industrials. In 1880, 219 stocks of 183 corporations were listed on the New York Stock Exchange.³ It was not until several years after 1860 that the practice of incorporation became sufficiently common to call for general laws upon the subject.⁴ Management's responsibilities to its stockholders were not clearly defined. The annual reports failed to communicate fair disclosure of the company's financial condition. As late as 1926 the Daily Times-Star of the State of Delaware advertised to prospective businesses that "... simple annual reports are necessary, but they do not require disclosure of the corporation's financial affairs."⁵

There are numerous accounts of fraudulent practices and unfair treatment to stockholders during these early years of growth.⁶ The New York Stock Exchange was gradually strengthening its reporting requirements, and in 1933 adopted a rule that all "listed" companies' applications and annual reports must contain "certificates" of independent public accountants.⁷ Following the market collapse of 1929, the government intervened in behalf of the general public. The enactment of the Securities Act of 1933 and the Securities Exchange Act of 1934 resulted in the creation of the Securities

3 Foulke, op. cit., p. 25.

4 William Z. Ripley, Main Street and Wall Street, p. 23.

5 Ibid., p. 30.

6 For many interesting accounts of manipulations by corporations, see chapter entitled "Stop, Look, and Listen", Ripley, op. cit., Chapter 6.

7 Editorial, "Corporate Annual Reports", The Journal of Accountancy, V. 102, No. 6, p. 31, December, 1956.

and Exchange Commission (S.E.C.). The S.E.C. has the power to obtain such information as is necessary and appropriate to public interest and protection from those corporations whose securities come within jurisdiction of its

⁸ powers. However, the rules and regulations of the commission do not prescribe the accounting to be followed except in certain basic respects. The S.E.C. has the power to block the sale of public securities by firms who do not comply with its rules. ⁹ What the S.E.C. does expect in financial statements is well summarized by a former S.E.C. chairman, James J. Caffrey, who said:

I assume that the accountant has told me how much the business made or loss during the year and how much it can pay out without impairing the investment. I expect the statement to be complete and ... entitled to believe that charges and credits have not been tucked away or placed anywhere else. If there are necessary qualifications to what I read, I assume they will be flagged for me when they are most pertinent and will be stated in such a way as to permit me to appraise the statement intelligently.¹⁰

⁸ A thorough presentation of the S.E.C. and its activities can be read in Louis H. Rappaport's book entitled, S.E.C.: Accounting Practice and Procedure, New York: Ronald Press Company, 1956.

⁹ This is one of the S.E.C.'s most effective powers. On March 25, 1957 the S.E.C. blocked a public offering of common stock by Texas Western Oil and Uranium Company, for alleged non-compliance with its rules. The S.E.C. charged that the company failed to file the required semi-annual reports telling the number of shares sold and the use of the proceeds See "S.E.C. Blocks Public Offering of Texas Western Oil Stock", Wall Street Journal, V. CXLIX, No. 58, p. 5, March 25, 1957.

¹⁰ Edward P. Tremper, (C.P.A.), "Accountant Auditing Statement of S.E.C. - Registered Company Has a Responsibility to Public as well as to Management," The Journal of Accountancy, V. 97, No. 2, p. 214, February, 1954.

The inception and widespread growth of the corporation has undoubtedly contributed much to the need for and improvement of financial statements. The New York Stock Exchange and the Securities and Exchange Commission have exerted their forces to assure the public that financial statements reasonably and fairly disclose all pertinent financial information regarding a business. Two other factors which have greatly enhanced the use of financial statements are governmental regulation and tax regulation. These factors will now be reviewed briefly.

The Hepburn Amendment to the Interstate Commerce Commission (I.C.C.) in 1906 symbolized the impetus given to governmental regulation. Under the amendment the power of the I.C.C. was greatly strengthened. The I.C.C. was given authority to standardize reports of all railroads and many other utilities coming under its jurisdiction. The allowance for depreciation was discussed here for the first time. The basis of accumulation was to be cost. Previously renewals and replacements were charges against operations.¹¹ Even today the yearly reports of railroads contain a more thorough presentation of financial condition and operations than the ordinary industrial corporation. The Seaboard Railroad devotes a full page or more to such items as equipment trust certificates, capital expenditures for road and equipment, distribution of operating expenses (2 pages in detail), revenues and expenses classified by months, traffic statistics, classification of tonnage, train, locomotive and car statistics, and inventory of equipment (in detail).¹²

11 Percival F. Brundage, "Milestones On the Path of Accounting," Harvard Business Review, V. 29, No. 4, O. 73, July-August, 1951.

12 The Seaboard Air Line Railroad Company, Annual Report for 1956.

The Sixteenth Amendment in 1913 gave Congress the power to levy taxes on income without apportionment among the states. Excess profits tax and war profits tax were in effect during the two major world wars. In addition, many cost-plus war contracts encouraged expansion and improvement of accounting records and reports. The Revenue Act of 1918 stated that "approved standard methods of accounting will ordinarily be regarded as clearly reflecting income." As a result of heavy taxes a great many companies found it necessary or desirable to resort to public financing. This tremendous increase in widespread public distribution of corporate securities brought about a demand for more comprehensive financial statements for prospectus purposes. More complete annual and interim reports to shareholders was another resultant.¹³

Financial statements and reports are received and reviewed by many audiences. Among these are those people responsible for a company's management, bankers and creditors, investors, and the general public. To some extent each of these groups read, analyze, and make decisions based on a company's reported financial condition. It will be necessary now to discuss the interests which each of these groups have in relation to financial statements.

Management is the group most directly concerned with financial statements. These financial summaries are a reflection on the performance of a business - and its management - during the fiscal year or years. "The central problem of financial management is to manage the assets so that sufficient cash will be available to meet debts as they mature."¹⁴ The object of continuing or

13 P. F. Brundage, op. cit., p. 74.

14 Bion B. Howard and Miller Upton, Introduction to Business Finance, p. 63.

furthering operations is to realize a maximum of business profits. This involves keeping costs at a minimum through the economical use of the factors of production. Insofar as possible, accounting attempts to measure the success or failure of an organization in terms of profitability.

An executive has the best opportunity to inspect the component parts of a financial report and to determine present and future plans based on past results. For instance, sales of filter-tipped cigarettes accounted for only a negligible part of total industry sales prior to 1954. In 1956, filter-tipped sales amounted to 25-30% of total sales and it is estimated that they will account for over 75% of total cigarette sales at the end of 1957.¹⁵ Sales analysis and gross profit margins are necessary factors which management must consider regarding new products and their expansion. In summary, management is vitally concerned with their company's performance, and financial statements provide an adequate record with which performance can be judged. The absence of a good financial statement is usually the first basic evidence not only of a weakness in financial policy but also in overall management skill.

Bankers and other leaders of money are other groups who are relying more and more upon financial statements as a basis for making loans. This view is expressed by Canby Balderston of the Federal Reserve Board who said:

The most fundamental test of quality of a loan is the ability of the borrower to repay ... In the case of a loan to business this test is met by a consideration of the use to which the credit is put and the additional profit that will result.¹⁶

¹⁵ A Wall Street staff reporter, "Tobacco Men See Latest Cancer Report - Spurring Swing to Filter-Tipped Cigarettes," Wall Street Journal, V. CXLIX, No. 58, p. 15, March 25, 1957.

¹⁶ C. Canby Balderston, "What Marketing Men Should Watch Concerning Credit," Vital Speeches, V. XXIII, No. 1, pp. 27-28, October 15, 1956.

Through necessity, a banker's analysis must be thorough. He must pursue a path of caution in the lending of money because of the trust relationship between himself and depositors. Bankers are relying more than ever before on certified public accountants in connection with loans to businesses. The Robert Morris Associates state:

The practice of employing an independent certified public accountant to examine and report on the financial statements has grown very substantially over the past twenty-five years, and is today a customary requirement in connection with a loan application.¹⁷

It is probable that all other lenders of money are depending heavily on analysis of financial statements.

Creditors were among the first groups who encouraged the use of financial statements as a basis for the extension of credit. The importance of credit to an expanding economy cannot be overemphasized. At times in past years, as much as ninety per cent of the sales of all manufacturers, wholesalers, and jobbers were made on credit.¹⁸ Roy A. Foulke of Dun and Bradstreet, Inc. said this of credit men:

These men knit together the widely diversified parts of our entire commercial organism and they are ... in strategic positions to study the ever changing strengths and weaknesses of their customers. Their hands are on the controls at the locks in the canal through which flows the steady stream of merchandise They are responsible for seeing that those concerns which are entitled to credit obtain their full measure, and those which are not entitled to it are gradually restricted.¹⁹

17 Robert Morris Associates, "Financial Statements For Bank Credit Purposes," The Journal of Accountancy, V. 97, No. 2, p. 162, February, 1954.

18 Howard and Upton, op. cit., p. 328.

19 Roy A. Foulke, Behind the Scenes of Business, p. 25.

Dun and Bradstreet, Inc. strongly encourages the use of financial statements in making credit investigations.²⁰ Today, it is not an uncommon practice for large businesses to send interim and annual reports to their major creditors.

Investors in corporate securities form another large group who are vitally concerned with the financial condition of corporations. Only a "going" concern can meet interest payments, pay dividends which represent a fair return on investment, and still maintain good financial stability.

Corporations have been forced to raise more and more capital from outside sources in an effort to keep abreast of a rapidly growing and competitive industry. Capital outlays, research, advertising, and payrolls are larger than ever before. Management has been forced to concede more informative reports to outsiders.²¹ Besides the internal need for new capital, the external forces of governmental regulation have given impetus to standards of fair disclosure.

Basically, the most important source of all investment is the savings of people. Over nine million persons furnish corporations with ownership capital. These people come from all walks of life, especially in the middle-income groups.²² A major job of financial reporting is to adopt the report accordingly.

20 For credit purposes, Dun and Bradstreet publishes a bimonthly Reference Book which contains the names of all active commercial and industrial businesses in the United States together with two symbols; one indicating the lines of business activity, and the other the estimated financial investment and general credit worthiness.

21 The first conventional annual report was issued in 1858 by the Borden Company. American Telephone and Telegraph (1885), Monsanto (1902), and the "all revealing" annual report of U.S. Steel (1902) were among other early reports. For a history and description of annual reports through 1946, see Henry A. Dalton, A Study of Annual Reports to Stockholders of Industrial Organizations, (Master's Thesis, University of Richmond, Virginia.).

22 Probably as much as one-half of these investors are female. Refer to W. L. Crum, "Analysis of Stock Ownership," Harvard Business Review, V. 3, No. 3, pp. 36-54, May-June, 1953.

Today's annual reports of financial condition must be presented in such a way as to be amenable to several levels of understanding and interest. The use of ratios in financial analysis provides a simple starting point for additional projections. Investors should be aware of the meaningfulness as well as the limitations of simple ratio analysis.

Financial statements are read by a score of other interested people. Businessmen, teachers, financial analysts, employees, and many others who have varying degrees of interest in yearly and interim reports. Many companies believe that the annual report should be a narrative of all business activities to a varied audience. "If such be the case, then annual reporting is becoming a social document."²³ The public is rapidly becoming more aware of the fact that the ups and downs of major corporations have far reaching repercussions. Annual reports stimulate this awareness.

It has been stated that each of these groups above analyze to varying degrees financial statements of corporations. The activities of the New York Stock Exchange and the S.E.C. have made financial analysis more meaningful. The Certified Public Accountant has had a major role in examining and approving financial statements for fairness, consistency, and conformity with accepted accounting principles. The public accountant has played an influential role in prescribing form and terminology of statements. In this respect, financial statements have been made easier to read, analyze, and comprehend. The success and growing need for certified public accountants is a tribute to a profession vital to industry and to the public. From

²³ Robert D. Hay, "Management Thinking Concerning Corporate Annual Reports," Accounting Review, V. 30, No. 3, p. 449, July, 1955.

1896, when the first certified public accountant's certificate was issued, this profession has grown to an estimated 60,000 in 1956, and 70,000 are predicted for 1960.

It becomes necessary now to discuss the means by which financial statements are analyzed by interested groups or persons. The ratio is the most commonly employed tool used in making an analysis of a financial statement. A recent survey disclosed over sixty-six per cent of persons questioned believed ratios one of the best ways to interpret financial and statistical information.²⁴ Alexander Wall became one of the foremost proponents of ratio analysis. He criticized bankers who based decisions in regard to granting credit on current ratios alone, and he emphasized that it is necessary to consider many other relationships not relating to current items.²⁵

By definition, a ratio is a relationship existing between two numbers. In financial analysis, a ratio expresses the relation of one part of the statement to another. The underlying principle of ratio analysis is that the proportion or relation of one item to another is far more important than the amount of each item expressed in dollars. In order to be useful, a ratio must be based upon a logical and meaningful operational relationship.²⁶

²⁴ Idem.

²⁵ Alexander Wall, "Study of Credit Barometrics," Federal Reserve Bulletin, V. 5, pp. 229-243, March, 1919, as found in John N. Myer's book, Financial Statement Analysis, pp. 11-12. Also see Alexander Wall, Analytical Credits. Indianapolis: The Bobbs-Merrill Company, 1921, and Alexander Wall, How to Evaluate Financial Statements. New York: Harper & Bros., 1936.

²⁶ Howard and Upton, op. cit., p. 129.

The ratios used in financial statement analysis are of three kinds. First, the balance sheet ratios express relationships existing between two items in the balance sheet. Second, income statement ratios which express relationships existing between two items in the income statement. And finally, mixed ratios which express relationships existing between items in the balance sheet against items contained in the income statement. All three types of ratios must be used in order to thoroughly analyze the two financial statements.

There are certain standards which have been developed to which ratios must be compared. These standards may be expressed as absolute, "average," and historical.²⁷ The absolute standard is the least used since it suggests the existence of some inherent trait common to all types of business. This is generally far from being true. The "average" or industry standard is a much more useful figure since it states the average performance of other business units in the particular industry. Dun and Bradstreet compiles and publishes many "industry" standards each year. Finally, the historical standard relates the past performances of a particular business with its present performance. This might imply a period of improvement or decline which is extremely important information to a prospective investor. Usually, reliance upon these last two standards in testing a particular condition produces revealing results.

Ratio analysis has many limitations. It should always be remembered that analysis of financial statements is not an exact science. Ratios are clues or indicators, not proofs. These clues must be investigated further

27 Ibid., p. 130.

before being confirmed or disallowed. It is still necessary to use good sound judgment in interpreting this data in the light of current and prospective conditions. Furthermore, the significance of a ratio may vary from one type of company to another. Industrials, utilities, and banks all have their "pet" ratios and each has a set of standards different from the other. For instance, in analyzing an industrial corporation, particular stress would be placed upon working capital position. In railroads, working capital position is not so important, but maintenance policy is extremely important. In conclusion, it is necessary to clearly understand the import of the particular ratio being used and to be familiar with its limitations.

Summary. Over the past decades, many improvements were made in the field of accounting. These improvements were brought about by internal and external forces, both of which have contributed to the advancement of financial reporting. Corporate financial statements vitally concern creditors, bankers, investors, and the general public as well as management. The average analyst is overwhelmed by the huge dollar amounts of the total statement, and he must break down the statement into logical parts in order to more readily understand what exists there. The use of ratios aids the reader in his analytical journey. The three kinds of ratios are balance sheet ratios, profit and loss statement ratios, and mixed ratios. The creditor, the banker, and the investor each has his "pet" ratios, but a thorough analysis using all applicable ratios is desirable. Ratios are only indicators of financial position, and complete dependence upon them should be avoided.

CHAPTER II
ANALYSIS OF BALANCE SHEET
CURRENT SECTION

The balance sheet is constructed to serve a dual purpose. It asserts the financial picture of a business at a particular moment of time, showing in one hand the properties (assets) that are being utilized and in the other hand, the sources of these properties. These sources are either liabilities of the properties or equity (ownership interest) in the properties.

The construction of a balance sheet is an important and difficult task. It stimulates the decisions of thousands of interested parties. Since a "going" concern is dynamic, its assets, liabilities, and equity are continually changing in proportion to one another. The accountant, as camera-man, finds it extremely hard to bring to focus an exact value to each account in a financial picture. It takes a combination of recorded facts, accounting conventions and postulates, and informed personal judgment to produce the necessary financial statements.¹ In this respect the statements cannot be exact nor are they expected to be. In the₂ subsequent analysis it will be necessary to always bear this fact in mind.

1 Myer, op. cit., pp. 19-23.

2 George O. May, chairman of American Institute of Accountants in 1932, said in a letter to a Committee on Stock Listings, New York Stock Exchange that ... "it (his committee) believes that there are two major tasks to be accomplished - one is to educate the public in regards to the significance of accounts, their value and their unavoidable limitations, and the other is to make the accounts published by corporations more uniform and authoritative." Brundage, op. cit., p. 75.

For purposes of this analysis, the balance sheet will be divided into two distinct groups. The first group is composed of items which are constantly changing form; namely, current assets and current liabilities. The second group includes the more stable items, such as the fixed assets, long-term liabilities and equity. This chapter will be concerned primarily with analysis of the first group. Chapter III will serve to explain various analyses of the fixed assets and liabilities.

It is necessary to define what is meant by current assets and current liabilities in order to ascertain whether or not these items are properly classified in a balance sheet. ³ The arbitrary one-year rule has become obsolete. The American Institute of Accountants in its Bulletin No. 30 recommends that the "operating cycle" be recognized as a concept of major importance in determining the period and kinds of items to be included as current. The "operating cycle" is the average time required to complete a round of conversions in operations of the business - cash to inventories and prepaid expenses, to receivables to cash. The bulletin recommends the following assets and liabilities as properly regarded as current:

Assets:

Cash available for current operations
 Inventories, including supplies
 Trade receivables
 Receivables from officers, employees, affiliates, and others if collectible in the ordinary course of business within a year
 Installment and deferred receivables, if due in accordance with terms prevailing throughout the industry
 Temporary investments
 Prepaid current expenses

³ There is little problem today in the proper classification of accounts of financial statements which have been examined and bear the unqualified approval of a certified public accountant.

Liabilities:

- Debts such as accounts and notes payable and accrued liabilities incurred for items applicable to the operating cycle
- Income taxes, whether payable within one year or not
- Collections received in advance for goods to be delivered or services to be performed in the near future (but not long-term deferred credits)
- Loans secured by life insurance policies, if, by their terms or by intent, they are to be paid within twelve months
- Other debts which presumably will be paid "within a relatively short period of time, usually twelve months," such as:
 - Short-term debts arising from the acquisition of fixed assets
 - Serial maturities of long-term debts
 - Operating-reserves, such as those provided for guaranteed servicing of products already sold.

Current assets and current liabilities bear important relationships with one another. Figure 1 (page 16) will explain in part the interrelationships existing between the two major divisions of the balance sheet and the division of interest in the properties. It is only natural that a short-term creditor would study carefully the adequacy of a company's circulating or current assets since his strongest claim lies in those assets. The excess of current assets over current liabilities is termed working capital or less often, net working capital.⁵ This working capital is the creditors' margin of safety and represents that portion of the current assets which has been supplied by the more permanent investors.

⁴ As taken from excerpts of Bulletin No. 30 contained in H. A. Finney and Herbert E. Miller, Principles of Accounting: Intermediate, Fourth Edition, pp. 132-134.

⁵ Some businessmen and economists identify the term working capital with the total current assets and the term net working capital is used to distinguish the excess of current assets over current liabilities. Refer to Harry G. Guthmann and Herbert E. Dougall, Corporate Financial Policy, p. 387.

Every company needs such an excess of current assets over current liabilities as is necessary to keep up the circulation of the capital from cash to inventories to receivables and back again to cash. One of the main financial problems of management is to determine the need for liquidity and then to maintain a regular movement of cash into other working assets and back again at the necessary rate. A healthy circulation is as important to a business as to the human body.⁶ The rate of circulation differs according to the types of industry. A business which derives most of its revenue from services rendered normally needs much less working capital than one which offers goods for sale. Liberal credit plans and installment sales greatly increase the need for working capital. Thousands of business enterprises are declared bankrupt each year due to lack of capital.⁷ The following is an outline of the general factors which are fundamental in determining the working capital requirements:

I. Inventory:

1. Nature of business
2. Volume of sales
3. Distribution of sales throughout the year, or seasonal variation
4. Operating conditions
 - a. need for securing stock in advance of manufacture or sale
 - b. period of manufacture
 - c. time interval between manufacture (or purchase) and sale

⁶ Guthmann and Dougall, op. cit., p. 389.

⁷ Of this Roy A. Foulke, Vice-President of Dun and Bradstreet, Inc., remarked: "For many years students of business failures classified a large per cent of the annual difficulties as being due to 'lack of capital.' It is probable that a more careful study of these businesses would have developed a modified classification of the 'unsound or inexperienced use of capital' rather than 'lack of capital'." Foulke, op. cit., p. 219.

- II. Accounts and notes receivable
 - 1. Volume of credit sales
 - 2. Seasonal distribution of sales
 - 3. Terms of sale
 - 4. Collection policy
 - 5. Financing receivables or factoring
- III. Accounts and notes payable to merchants
 - Credit terms applying
- IV. Notes payable to banks
 - 1. Credit standards that limit amount of credit allowed on current assets
 - 2. Protection afforded by other than current assets
 - a. amount of other assets
 - b. method of other financing
 - 3. General business conditions
- V. Cash
 - 1. Ordinary current needs
 - 2. Special or emergency needs
- VI. General factors
 - 1. Efficiency of management 8
 - 2. Attitude and temperament of management

The brief discussion of the working capital portion of the balance sheet was designed to acclimate the reader with the overall significance of business liquidity. It was a necessary forerunner to the ratio analysis of working capital condition which will now begin. For purposes of this discussion a ratio may be defined as the relationship, or proportion, that one item bears to another (expressed in dollars). Ratios will be expressed as a percentage or as a fraction according to accepted practice and effectiveness. The following ratios are instrumental in determining the general condition of a business's working capital:

8 A combination of the factors outlined and discussed by Charles W. Gerstenberg, Financial Organization and Management of Business, Revised Edition, pp. 349-367, and Guthmann, op. cit., p. 99. Also see Guthmann and Dougall, op. cit., pp. 392-394.

1. The current ratio
2. The quick or acid test ratio
3. Testing receivables
4. Inventory turnover

The Current Ratio. The current ratio is the ratio of current assets to current liabilities. It is probably one of the most widely used of all ratios. It is valuable particularly as one indication of the ability of a concern to meet its current obligations.⁹ A banker's rule of thumb is often stated to be that the current ratio should not fall below "two to one."¹⁰ However, a two to one ratio is not stressed today because new standards of measurement of financial standing have been developed. Dun and Bradstreet, Inc., compiles and publishes each year lists of important ratios in retail, wholesale, and manufacturing businesses. The diversity of current ratios in different lines of business for 1955 is illustrated below:

<u>Industry</u>	<u>Line of Business</u>	<u>Current Ratio</u> (median)
Retail	Dry Goods	4.67
Retail	Men's Furnishings	4.59
Retail	Hardware	4.50
Wholesale	Dry Goods	2.86
Wholesale	Men's Furnishings	3.03
Wholesale	Hardware	3.42
Manufacturing	Airplane Parts & Accessories	1.72
Manufacturing	Cotton Cloth Mills	4.16
Manufacturing	Breweries	2.20 ¹¹

⁹ By inverting the current ratio, the resulting fraction will show the amount it would be necessary to realize on the current assets in order to pay the current creditors in full. For a two to one ratio, assets must be liquidated at a minimum of one-half their book value.

¹⁰ This is an illustration of an absolute standard (see page 11) which once was widely used. Today it is used only as an industry and historical standard.

¹¹ Selected at random from Fourteen Important Ratios in 72 Lines of Business, Prepared by Dun and Bradstreet, Inc., pages not numbered.

An analyst should remember that ratios vary according to industry and line of business, and that each has a standard of its own. A ratio should serve only as one indicator of the general financial condition of a company and the analyst must look behind the ratio to find the reason for a condition. A ratio is an inference and not^a/finality.

The current ratio of a business changes radically from day to day as a result of operations. A company usually shows its most favorable balance sheet and current ratio at the end of the year when operations and inventory are at a seasonal low.¹² This can be illustrated in the following three simplified steps in the cycle of a merchandising business:

January 1 (Natural business year begins; inventory low)

Cash	\$20,000	Accounts payable	\$30,000	
Receivables	50,000			
Inventory	<u>20,000</u>			
Current assets	\$90,000	Current liabilities	\$30,000	Current Ratio 3:1

March 1 (Inventory is restored to normal level; receivables collected)

Cash	\$ 45,000	Accounts payable	\$55,000	
Receivables	20,000			
Inventory	<u>45,000</u>			
Current assets	\$110,000	Current liabilities	\$55,000	Current Ratio 2:1

June 1 (Receivables increase as result of credit sales)

Cash	\$ 45,000	Accounts payable	\$80,000	
Receivables	35,000			
Inventory	<u>40,000</u>			
Current assets	\$120,000	Current liabilities	\$80,000	Current Ratio 1.5:1

¹² This is one of the primary advantages of using a natural business year rather than a calendar year. See "Why Close Your Books At December 31?" Pamphlet prepared by Natural Business Year Committee of Illinois Society of Certified Public Accountants. Also "Suggested Fiscal Closing Dates" prepared by Business Year Committee of the American Institute of Accountants, Journal of Accountancy, V. 99, pp. 59-60, December, 1955.

From the preceding illustration it is evident that when making analyses it is necessary to compare ratios for one year with ratios of another year at the same period of time. Businesses in the same industry that have different fiscal years will have ratios that will not be comparable.

The current ratio is the reflection of a static condition, of a relationship existing for a short time between two variables, asset and liabilities.

Its significance varies with and is dependent upon:

1. seasonal influence
2. the extent to which the balance sheet reflects true values
3. the proportion of the different assets - cash more valuable than receivables and receivables more valuable than inventories
4. the degree of risk in possible value fluctuations particular to that industry¹³ or line of business, and
5. current business outlook.

In conclusion, the relationship between current assets and current liabilities is satisfactory not when the ratio meets any fixed standard, but when the quantity and quality of assets are such that maturing obligations may be met.

The Acid Test Ratio. The acid test or "quick" ratio is a ratio of the "quick" assets to current liabilities. These "quick" assets usually include cash, marketable investments, and receivables.¹⁴ Other less current assets such as inventories, supplies, and prepaid items are deleted since their realizable value is doubtful in case of liquidation and insolvency.

This ratio should be used as a supplement to the current ratio because it indicates the ability of a business to satisfy immediately the current debts, and is also of primary importance to management and short-term trade creditors. This is especially important when a company has unusually large

13 Guthmann, op. cit., p. 104.

14 Finney and Miller, op. cit., p. 173.

investments in inventories, or inventory is subject to severe fluctuation due to economic conditions and fashion changes. If the "quick" assets do not at least equal the current liabilities, that is, a ratio of 1:1, then the remaining current assets should be closely investigated because they represent the balance from which general creditors must be paid. The value of "quick" ratio in relation to the current ratio can be shown as follows:

Current assets:		Current liabilities:	
Cash	\$ 3,000	Accounts payable	\$25,000
Receivables	12,000		
Inventory	<u>45,000</u>		
	\$60,000		\$25,000
Working capital	\$35,000	Current ratio	12:5
		"Acid" ratio	3:5

(Assume one-third decline in inventory value)

Cash	\$ 3,000	Accounts payable	\$25,000
Receivables	12,000		
Inventory	<u>30,000</u>		
	\$45,000		\$25,000
Working capital	\$20,000	Current ratio	9:5
		"Acid" ratio	3:5

In this instance the current ratio appears to be adequate. The "acid test" ratio (3:5) seemed too low, and a wise creditor would have pursued his investigation a little further. The present and future value of inventories should have questioned in view of the healthiness of the particular industry and general economic conditions (inflation-deflation). Severe inventory declines are normally preceded by warnings of one kind or another. Then too, inventories which are unproportionally large might be an indication of declining sales volume and obsolete merchandise. However, again the interpretation will depend on circumstances. If it is reasonably expected that the

inventories will be sold immediately and at the usual price, the "acid test" ratio should bear only little significance to the creditor.

Testing Receivables. The third analysis of current items in the balance sheet consists of the ratio found by dividing the accounts and notes receivable from trade customers by the average net credit sales per day.¹⁵ Using the customary 360 day basis, net charge sales of \$1,080,000 would render average sales of \$3,000 per day. If receivables were \$180,000, then the equivalent of 60 days charge sales was still uncollected. The receivables to net sales ratio would be \$180,000 to \$3,000 or 60:1. This may or may not represent an unfavorable situation.

If the normal credit period were 30 days in the above situation, then receivables should amount to only \$90,000 ($\$3,000 \times 30$), providing all accounts were paid promptly, or a ratio of 30:1. Since receivables are \$180,000 this would indicate that at least half the accounts or \$90,000 were overdue.¹⁶ Again, this ratio must be considered along with other factors. In the above example it was assumed that sales were uniform throughout the year. In a seasonal industry such as Christmas trees, almost the entire sales volume would occur in November and December. At the end of the calendar year the accounts receivable might appear highly unfavorable, and one month later, after collections were made, extremely favorable.

Another factor which must be considered is the length and terms of the

¹⁵ Other similar ratios are sales to receivables and average collection period. See Foulke, op. cit., pp. 356-357 for a discussion of the latter method.

¹⁶ This would necessitate disregarding prepayments or discounts by customers.

credit period. Many businesses give discounts if charge sales are paid for quickly, such as 2/10 net 30. In many instances the length of the credit period is considerably longer than 30 days, and often 60 or 90 days. The longer the normal credit period, the higher the accounts receivable.

Accounts receivable which are past due ultimately cause additional expenses and losses to the creditor. In general, smaller concerns, especially in retail lines are slower in their collections and suffer the larger expenses of collection and bad debt losses.¹⁷ This has always been a major area of trouble for managers of small businesses. For as accounts receivable become delinquent, the flow of cash into the business is lessened and if this condition is not corrected, the company's ability to meet debt obligations is¹⁸ impaired to the point of ultimate failure.

Many concerns have turned to factoring their accounts receivable as a means of increasing the inflow of usable cash and making a better financial¹⁹ showing. This is especially true during periods of rapid expansion. As additional sales are made accounts receivable grow larger and larger, and even though the business is making more profit, less cash is available.

17 Guthmann, op. cit., p. 113.

18 Idem.

19 For an excellent article which thoroughly discusses the use of factoring, its costs, and the advantages and disadvantages, see Walter N. Kelly, "How To Meet Today's New Financial Requirements Through Modern Factoring," Journal of Accountancy, V. 99, No. 3, p. 3, March, 1955.

Thus,

assets may be "quick" in accounting parlance, but for the purpose of building up his business, they are as frozen as the polar ice cap As fast as current receivables are paid, new ones take their place, and the more the business expands, the deeper the freeze.²⁰

The effect of factoring on working capital position is illustrated below.

Balance Sheet - <u>Before Factoring</u>		Current liabilities:	
Current assets:		Bank loans	\$ 20,000
Cash	\$ 15,000	Accounts payable	100,000
Accounts receivable	100,000	Accrued taxes	<u>30,000</u>
Inventories	<u>135,000</u>		
	\$250,000		\$150,000
Working capital	\$100,000	Current ratio	1.67:1

Balance Sheet - <u>After Factoring</u>			
Cash	\$ 15,000	Bank loans	\$ 10,000
Accounts receivable	20,000	Accounts payable	30,000
Inventories	<u>135,000</u>	Accrued taxes	<u>30,000</u>
	\$170,000		\$ 70,000
Working capital	\$100,000	Current ratio	2.43:1

In this instance, accounts receivable of \$80,000 were factored and with this additional cash, bank loans were reduced by \$10,000 and accounts payable by \$70,000. The current ratio was improved from 1.67:1 to 2.43:1. The cost of factoring accounts receivable ranges from $\frac{1}{2}\%$ to $1\frac{1}{2}\%$ of total accounts financed, or somewhat less than the typical 2% discounts earned on prompt payment of trade liabilities.²¹

20 As found in Theodore H. Silbert's, "Financing and Factoring Accounts Receivable," Harvard Business Review, V. 30, No. 1, p. 39, January - February, 1952.

21 Kelly, op. cit., p. 3.

The schedule below prepared by Dun and Bradstreet illustrates the variety²² in length of collection period for different lines of business activity.

AVERAGE COLLECTION PERIOD

Lines of Business Activity	Median (number of days)					5-Year Average
	1943	1944	1945	1946	1947	
<u>Manufacturers</u>						
Auto Parts and Accessories	45	30	35	20	29	32
Bakers	19	12	12	20	22	17
Chemicals, Industrial	34	32	27	34	32	31
Fur Garments	46	43	40	60	54	49
Meats, Packers	11	11	15	14	14	13
Stoves, Ranges and Ovens	43	25	29	25	31	31
<u>Wholesalers</u>						
Auto Parts and Accessories	28	26	29	30	29	28
Butter, Eggs and Cheese	18	18	13	17	19	17
Cigarettes and Tobacco	16	14	10	15	14	14
Groceries	30	17	18	19	18	20
Paper	31	30	26	26	27	28
<u>Retailers</u>						
Furniture, Installment	60	66	91	92	78	77
Lumber	29	33	30	27	33	30

Source: Roy A. Foulke, Practical Financial Statement Analysis, Schedule 43, pp. 382-383.

²² This is a random sample of a much larger group. The liberal credit terms allowed today have undoubtedly lengthened the number of days in the average collection period since 1947. The average collection period can be computed by dividing accounts and notes receivable by the net credit sales per day. See Foulke, op. cit., pp. 356-357.

Inventory Turnover. Inventory turnover is a comparison of the amount of goods sold per year with the stock carried. This ratio is used as a measure of merchandising efficiency and as an indication of inventories being overstocked or understocked. This ratio may be stated in one of two ways, either

$$1. \quad \frac{\text{Cost of Goods Sold}}{\text{Inventory at Cost}}$$

or,

$$2. \quad \frac{\text{Sales}}{\text{Inventory at Selling Price.}}$$

Industrials normally used the first method to determine inventory turnover whereas retail stores commonly use the second method. In either method, the average inventory for the year should be used. Where perpetual inventories are kept, thirteen inventory totals are used in computing the average inventory. However, the analyst will usually have access to only one or two inventory totals with which to compute the average yearly inventory; these being the annual balances.

Again, it is assumed that there is an established average or industry standard by which the resultant ratio can be measured. Since this is normally true, the relationship of sales to inventory of one concern within an industry should be similar to that of a like concern with the same sales volume. If it is not, then the analyst should pursue his investigation further.

For instance, assume that the companies A and B are nearly identical

23

in capital structure and in sales volume. If net sales for the year were \$2000,000 for both A and B and A's inventory was valued at \$100,000 compared to B's inventory of \$200,000, the inventory turnover would be twenty and ten for A and for B respectively. It is improbable that the functions of purchasing, storing, selling, and distributing should account for such a wide difference in inventory turnover. If it is assumed that the "industry" standard turnover was nineteen, then Company A's inventory is about average and Company B's inventory is over-valued (or over-stocked). Company B may have accumulated large quantities of old and slow-moving merchandise through poor selection. Being over-inventoried has a definite meaning. It means that the inventory base for sales activity is too large in relation to the sales result or that sales are too small in their relation to the inventory

24

carried. In the above instance, Company A can sell at a lower margin of profit than Company B, and still make a larger profit because it keeps its inventory moving faster.

25

When a merchant buys an amount in excess of his usual needs based on his expectation of a rise in prices and with the hope and intention of making an extra profit in the near future, then there is a true condition of being over-inventoried on the basis of inventory speculation.

26

Creditors and investors should take precautionary steps under these circumstances.

23 Comparisons between business units should be confined to those that are strictly comparable from the standpoint of function, product, size, territory and general operating conditions. Edward F. Gee, The Evaluation of Receivables and Inventories, p. 147.

24 Alexander Wall and R. W. Duning, Ratio Analysis of Financial Statements, p.130.

25 Much of the success of "discount" houses has been based on their ability to turn merchandise over rapidly at low profit margins and reduced operating expenses.

26 Wall and Duning, op. cit., p. 131.

Again, if the industry standard for inventory turnover had been ten in the hypothetical case cited above, then Company B's turnover (10) would have been normal and Company A's turnover (20) abnormal. The analyst should question the ability of Company B to support such a large volume of business on such a small inventory. In many instances, companies will stop buying merchandise (or raw material) in the last month of the fiscal year but still continue to make their usual sales. As a result inventories will be drained to a low ebb, and the cash collected through sales is used to reduce current liabilities. This "window dressing" enables the business to reflect a much better current financial picture than would otherwise be obtainable.²⁷ The current position of the company would be greatly altered when inventories were restored to their normal level.

Again, Dun and Bradstreet compiles data on inventory turnover for many businesses in manufacturing, wholesaling and retailing lines. A random selection of these is shown on page 30.

The ratio and all other which involve inventories lose much of their significance where the book value of inventories are reported on the LIFO cost basis. Under LIFO (last-in -- first-out) the books show the balance of merchandise remaining as inventory at acquisition costs of the distant past. LIFO has been adopted during inflationary periods as a means of matching current expense against current income and thus reducing income

27 The gross profits method of estimating inventories is used as a check against this practice. Under this method, an approximate inventory balance can be estimated and this can be compared against the actual inventory balance. For a complete discussion, see Chapter IV, p. 56.

Net Sales to Inventory - 1955

<u>Line of Business</u>	<u>Times (median)</u>
<u>Manufacturing</u>	
Auto Parts and Accessories	6.1
Bakers	31.2
Breweries	18.8
Chemicals, Industrial	7.7
Furniture	8.1
Machinery, Industrial	4.6
Paper	7.6
Stoves, Ranges and Ovens	5.0
<u>Wholesale</u>	
Auto Parts and Accessories	5.1
Cigars, Cigarettes, and Tobacco	26.4
Fruits and Produce, Fresh	40.3
Groceries	10.5
Lumber	12.9
Paper	7.5
Shoes, Men's, Women's and Children's	7.3
<u>Retail</u>	
Clothing, Men's and Boys'	3.7
Furniture	4.1
Hardware	4.0
Women's Specialty Shops	7.0

Source: Dun and Bradstreet, Inc.,
Fourteen Important Ratios in
Seventy-two Lines of Business
1955

taxes upon the unreal profits of inflation. Any attempt to measure inventory turnover by comparing the cost of goods sold at current prices against inventory valued at prices of perhaps ten years earlier is impossible. Similarly, the current ratio is understated.

This brings to a conclusion the discussion of four significant ratios used in analyzing the current section of the balance sheet. There are many other ratios which are not considered on par with the four ratios discussed above. It seems necessary to briefly mention several of them here. These are the ratios of current liabilities to tangible net worth, accounts payable turnover, current asset turnover, and inventory to net working capital.

Current liabilities to tangible net worth. The ratio of current liabilities to tangible net worth is one that has been in existence almost as long as the current ratio. It was most significant during the early periods of corporate history when almost all liabilities were current liabilities.²⁹ The rule then was that creditors should have no more funds at stake in a particular endeavor than the owners of the business.³⁰ Since large amounts of both current and long-term liabilities are common today, this ratio is more useful when expressed as total debts to tangible net worth or tangible assets (see p. 42, Chapter III).

28 For two interesting articles on the pros and cons of LIFO, see H. T. McAnly, "The Case For LIFO: It Realistically States Income and Is Applicable To Any Industry," Journal of Accountancy, V. 95, No. 6, pp. 691-700, June, 1953 and Maurice Moonitz, "The Case Against LIFO," Ibid., pp. 682-690. In addition LIFO has been accused of accelerating rather than decelerating the affects of inflation. Refer to Waino W. Suojanin, "Lifo as a Spur to Inflation: The Recent Experience of Copper," Accounting Review, V. 32, No. 1, pp. 42-50, January, 1957.

29 Foulke, op. cit., p. 203.

30 Idem.

Accounts payable turnover. The accounts payable turnover is used as an indication of how long it would take to retire current debt from operations. The formula is:

$$\frac{\text{Accounts payable}}{\text{Sales Minus Expenses}} \\ \text{(Monthly Average)} \quad 31$$

Therefore, if sales were \$10,000 per month and expenses \$1,000, \$9,000 would be available to retire current debt. Accounts payable of \$18,000 could be extinguished in two months. At best, this is a crude test useful in mercantile credit work but subject to many criticisms and assumptions. ³²

Current asset turnover. This ratio is found by dividing the net sales for the period by the average current assets used during the period. The result is to give an overall impression of how rapidly the total investment in current assets is being turned and is supposed to be an index of efficiency. However, a faster turnover of assets does not assure more profit. To the contrary, less profit is sometimes the case. A much more meaningful analysis can be made by computing two ratios:

1. the number of turnovers based on cost of sales and expenses, which is the measure of the use of the total current assets. ³³
2. the rate of profit per turnover of total current assets.

Inventory to net working capital. The ratio of inventory to net working capital is used as a corollary to the acid-test ratio. It may be used in conjunction with the current ratio to measure the amount of working

31 Guthmann, op. cit., p. 119.

32 This ratio is subject to numerous assumptions which render it more theoretical than practical. Ibid., pp. 119-121.

33 An illustration of these ratios can be seen in Finney and Miller, op. cit., p. 177.

capital tied up in inventory.³⁴ If the acid-test ratio is over one, then the inventory to working capital ratio is less than one and the current creditors are more than 100 per cent protected by quick assets. The importance of the inventory and its proper proportion to other items on the statement cannot be overstressed. Its liquidity, balance, and correct cyclical possession are factors that reflect efficient management in the property statement and profit and loss account.³⁵

It seems necessary to conclude by remarking that the use of ratios in analyzing financial statements is much more effective if relevant data for several years can be reviewed. Based on this historical information and along with financial statistics for the current year, significant trends can be developed. The American Institute of Accountant's Committee on Accounting Procedure in its Bulletin No. 6 said:

... the increasing use of comparative statements in the annual reports of companies is a step in the right direction. This practice enhances the significance of the reports, and brings out more clearly the nature and trends of current changes affecting the enterprise...

It is now a common practice for companies to include balance sheets and income statements for at least the last two years of operations. Other significant statistics are given for periods of five, ten, and even fifteen years preceding the current year. Therefore, ratio analysis can be extended into past years operations.

³⁴ Wall and Duning, op. cit., p. 150.

³⁵ Idem. This ratio is used also as a supplement to the ratio of net sales to inventory. See Foulke, op. cit., pp. 334-338.

Summary. The analysis of the current section of the balance sheet is primarily an analysis of working capital position. It is especially informative as to the short-run solvency of a concern. Then too, it gives some indication as to the efficiency of management although this must be substantiated through analysis of the profit statement and other factors.

In any examination of the balance sheet, the proper arrangement of accounts must be studied. This chapter has touched on the proper classification of items only slightly. The published financial statements of any corporation listed on a major stock exchange must be filed with the SEC and accompanied by a certified public accountant's certificate. In this respect, financial statements need little rearrangement for ratio analysis. And finally, ratios must be computed and studied. Financial ratios based on statistics of several years' operations of a company are more valuable than those based only on the current year's operations. The ratios most widely accepted and used in analysis are:

1. the current ratio
2. the acid-test ratio
3. testing receivables
4. inventory turnover

Ratio analysis is only one factor among many which is used to evaluate the health of a business.

CHAPTER III
ANALYSIS OF BALANCE SHEET
FIXED SECTION

This chapter will be concerned with the discussion and analysis of the second major division of the balance sheet; namely, fixed assets and the sources of these assets, long-term liabilities and net worth. For the most part, this section appeals especially to bond and mortgage holders, stockholders, and bankers whose loans are granted for longer periods than one year. However, short-term creditors should have more than a passing interest here because the acquisition of new fixed assets or the dissolution of old long-term liabilities may have the undesirable effect of reducing working capital and impairing the general creditor's position.

Again, the major consideration of this chapter will be to present significant ratios which are indicative of the relationship existing between fixed assets, liabilities, and equity. It is necessary to emphasize again that these ratios are simple indicators of the general financial condition of a business and it is advisable (and necessary) to pursue analysis¹ beyond the ratio stage wherever possible. Before advancing further,

¹ Richard K. Paynter, Jr., Treasurer of New York Life Insurance Company, stated that in analyzing a corporation "we look carefully at the past record of a corporation, first, as it is summarized in corporate annual statements, breaking down the individual items, and then going behind the figures themselves to see that inferences drawn from them stand up. The figures of the annual statements in themselves have a deceiving certainty." Speech by Richard K. Paynter, Jr., entitled An Investor Looks At Management, February 8, 1957.

a brief explanation of the nature and classification of these fixed items
²
 seems necessary.

Fixed assets are assets of a relatively permanent nature used in the
³
 operation of a business and not intended for sale. These assets fall
 either into the classification of being either tangible or intangible.
 Intangible assets include patents, copyrights, trademarks, franchises,
 goodwill, and other assets having no physical substance but which have
 value because of the rights inherent in them. Intangible assets are usu-
 ally excluded when making analyses and computations involve only net tangi-
⁴
ble assets. Tangible assets include permanent investments, land, buildings,
⁵
 equipment, furniture and fixtures, natural resources, and deferred charges.

2 A rather thorough presentation of analysis of corporate reports is given each year by the American Institute of Accountants. Its yearly publication, Accounting Trends and Techniques in Published Corporate Annual Reports, records and points out the significant accounting trends as reflected in the annual reports of 600 survey companies. The classification and significance of balance sheet items is discussed throughout.

3 Finney and Miller, op. cit., p. 414.

4 This is because intangibles are very likely to have little value in liquidation even though they may have considerable value to a "going concern."

5 Finney's definition of fixed assets excludes permanent investments. For the purpose of this analysis it might be better to use the following definition of fixed assets: "The assets that are excluded from the current asset section may all be included in another group called ... fixed assets." For a discussion of the five prevailing definitions of fixed assets see Frank A. Singer, "Fixing 'Fixed Assets'," Accounting Review, V. 32, No. 1, pp. 104-106, January, 1957.

The proper valuation of fixed assets is a major problem of accountants. The Committee on Terminology of the American Institute of Accountants has defined value as used in accounts as:

the amount at which an item is stated, in accordance with the accounting rules or principles relating to that item. Generally book or balance sheet values represent cost to the accounting unit or some modification thereof; but sometimes they are determined in other ways, as for instance on the basis of market values or cost of replacement, in which cases the basis should be indicated in financial statements.

Thus, value is not necessarily an indication of an asset's utility but rather a measurement, in terms of dollars, in accordance with the rules of accounting applicable to the item measured. Therefore, long-term debtors and stockholders have claims on, and interest in fixed assets whose stated values are often somewhat meaningless.

The historical cost basis on which the fixed assets are measured does not provide a satisfactory basis for the measurement of the financial condition of a business, especially to those outside the business. This is true during times of widespread inflation. The adoption of LIFO as one method of valuing inventories is an attempt to curb the effects of inflation on current assets and, more important, current income. The need for improved accounting for fixed assets was emphasized by Robert C. Tyson, Vice-President-Controller for United States Steel, who stated:

It took twenty years to widely accept LIFO for short-term inventories.... Since in an economic sense facilities are only long-term inventories described by us for accounting convenience as fixed assets or capital goods, but differing fundamentally from short-term inventories only in rate of

turnover, we can be hopeful that comparable principles may be developed and extended to bring reality into depreciation accounting.⁷

Fixed asset depreciation is another area in which accountants and analysts encounter difficulties. Depreciation is based on the estimated life of fixed assets and each year a charge is made against income for that portion of fixed assets which was used up in manufacturing and marketing processes.⁸ In this way a certain portion of fixed assets is converted to current assets each year. The ideal situation might have current expenditures for fixed assets being provided for entirely by depreciation charges. Even in normal times this is improbable and in times of inflation,⁹ impossible. This description of fixed assets is purposely brief, and it is necessary now to describe the capital structure of a balance sheet.

7 Robert C. Tyson, We'd Better Improve Accounting For Fixed Assets Before Someone Does It For Us (From a paper given at the 25th Annual Accounting Conference, Ann Arbor, Michigan, November, 1951). As found in Journal of Accountancy, V. 96, No. 4, p. 463, October, 1953.

8 Ralph M. Besse, Vice-President of Cleveland Electric Illuminating Company, proposed that a flexible depreciation allowance based on inflationary ups and downs be designed. Under this plan depreciation rates would still be on the basis of original costs, but would vary according to changing dollar values. If rates were three per cent annually and prices increased one-hundred per cent, the allowance would automatically double to six per cent. See "Plant Expansion: How Industry Can Get the Cash It Needs," Editorial, Time, V. LXIX, No. 1, p. 75, January 7, 1957.

9 In a period of continually rising prices, all methods of depreciation fail because "the buying power recovered cannot equal the buying power expended." Depreciation in any period should represent capital expended in production of products (or services) in such a period, with capital defined as "actual amount of purchasing power." Consult Wilbert A. Walker, "Inadequate Depreciation in Metals Manufacturing Industry," The Controller, p. 572, December, 1956, as found in Journal of Accountancy, V. 103, No. 3, p. 88, March, 1957.

Capitalization of a corporation in an accounting sense is the sum of the par value of the stocks and bonds outstanding.¹⁰ Under normal circumstances, an established corporation will own property valued in excess of its capitalization. The primary sources of this "surplus" are retained earnings and premiums on stock.

Since the term capitalization is limited to outstanding securities, the term capital structure may be used to include the total combined sources of the net worth and liability section. These sources would include long-term debt, such as mortgages and loans, as well as total stockholder's investment including surplus. It is important to realize that surplus is as much of an investment as is capital stock, and any return on investment must take both into consideration. This ends the discussion of the characteristics of the balance sheet.

The ratios which are most significant to a preliminary analysis of the fixed section of the balance sheet are as follows:

1. Capital structure proportions:
fixed debt to net worth
2. Tangible assets to total debt
3. Working capital to funded debt
4. Plant turnover

A brief explanation of each of these ratios or proportions will now follow.

Capital Structure Proportions. For purposes of this analysis capital structure will be considered, rather narrowly, to be composed of bonds and net worth. This does not seem to be too unappropriate since the relation of bonds to net worth in most listed corporations relates almost the entire

¹⁰ Capitalization has many other meanings which are of no consequence here. Refer to Guthmann and Dougall, op. cit., p. 75.

story of the balance between borrowed and owned capital.

The proportion of capital represented by each class of security is important to both the bondholders and the stockholders. The larger the proportion of bonds, then the weaker is the position of both parties. Bondholders, in case of liquidation, have claims which are prior to those of the owners; and the owner's share of company assets are in effect cushions of safety. The smaller the cushion, usually the greater risk of loss. Stockholders' claims on assets as well as their shares of income are reduced by too large a proportion of bonds to equity. The reverse situation is quite true; the smaller the proportion of bonds, the stronger the position of bondholders and stockholders.¹²

This can be shown by the following simplified illustrations:

Case 1 -

<u>Assets</u>	<u>Liabilities and Equity</u>
Tangible assets \$100,000	Bonds \$75,000
	Net worth 25,000

Bonds/Net Worth = 3:1

Case 2 -

<u>Assets</u>	<u>Liabilities and Equity</u>
Tangible assets \$100,000	Bonds \$50,000
	Net worth 50,000

Bonds/Net Worth = 1:1

11 From the period 1946-1953, the sale of stocks and bonds and income from internal operations produced over ninety-one per cent of all corporate funds used during that period. Bonds supplied three times more funds than did new stock issues. Computed from a Special Release, U.S. Department of Commerce, Office of Business Economics, as found in G. Keith Funston, Wanted: More Owners of American Business, p. 4.

12 John H. Prime, Investment Analysis (Second Edition), p. 420.

In Case 1 each dollar of debt is supported by thirty-three cents worth of equity and in Case 2 three dollars worth of equity supports each dollar of debt. In each of the above Cases, assume that the business failed and was being liquidated, and that tangible assets were sold at two-thirds book value. Then, in Case 1, tangible assets would be sold for \$67,000 which would be prorated among the bondholders. Stockholders would get nothing. In Case 2, sale of assets for \$67,000 would be used in retiring bonds at full face value and \$17,000 would be prorated among the stockholders.

However, there is no set rule or ratio in regards to capital structure. Railroad and public utilities use bonds to a great extent because of their stability of earnings and ability to meet fixed interest payments. An arbitrary maximum percentage of bonds in the total capital structure for railroads has been established at fifty per cent and for utilities, sixty per cent.¹³ Manufacturing and merchandising businesses normally do not use bonds to such great extents, usually less than one-third of capital structure.¹⁴ Corporations which rely too heavily on debt instruments are subject to special regulation by the Internal Revenue Service under certain legal circumstances.¹⁵

13 Guthmann, op. cit., p. 158.

14 However, debt financing has been on the increase, and in many instances it has been excessive. Professor Sumner Slichter of Harvard University sounded the following warning in 1952: "The annual repayments on the present volume of private indebtedness have become large enough so that it will be difficult to offset them in a period of moderate or even mild recession." As quoted from Funston, op. cit., p. 3.

15 This is especially true when a corporation is classified as a "thin" corporation, one whose equity capital is inadequate for the business purposes it is designed to carry out. It is a matter of degree of borrowed funds to equity. Tax advisers recommend that under normal circumstances the ratio of debt to net worth be no greater than $3\frac{1}{2}:1$. Jay O. Kramer, "Tax Consequences of Inadequate Equity Capital: The Thin Corporation Problem," Journal of Accountancy, V. 96, No. 4, pp. 449-451, October, 1953.

In issuing securities management must weigh the many advantages and disadvantages of stocks and bonds. At the same time, they must try to keep a safe balance between the two securities. The final decision for the type of security to be issued is largely determined by the capital structure of the corporation, the purpose of the issue, the status of the money market, and what will be best for the corporation.¹⁶

An investor in analyzing a statement should recognize the dangers involved in heavy and excessive reliance on debt financing and keep in mind the general principle that debt should be kept within such limits that in times of recession insolvency would be improbable.

Tangible Assets to Total Debt. The ratio of net tangible assets to total debt is in some ways similar to the current ratio described in Chapter II. This ratio provides an indication of the tangible assets which are available for all creditors in case of liquidation. The ratio of total liabilities to tangible net worth¹⁷ is often used in place of the above ratio. Since net worth is significant as protection to creditors only in terms of the assets behind it, it seems more logical that a ratio should be used in which attention is centered on tangible assets. In this way intangible assets will be sought out and eliminated and the remaining assets can be examined more closely.¹⁸

The standard for this ratio depends directly upon the standard for desired capital structure proportions discussed earlier in this chapter. If bonds are limited to one-third of the total capital structure, then the

16 Paul B. Coffman, President of Standard Research Consultants, Inc., "The Business Climate," The Journal of Accountancy, V. 103, No. 2, p. 6, February, 1957.

17 Foulke, op. cit., pp. 226-249.

18 Guthmann, op. cit., p. 160.

ratio of assets to debt should not fall below three to one. This is illustrated simply, below.

Tangible assets	\$300,000	Bonds	\$100,000
		Net worth	200,000

$$\text{Tangible assets/total debt} = 3:1$$

However, the introduction of current liabilities complicates this oversimplified illustration.

Current assets	\$150,000	Current liabilities	\$75,000
Fixed assets	150,000	Bonds	75,000
		Net worth	150,000

$$\text{Tangible assets/total debt} = 2:1$$

In each instance the capital structure proportions (bonds/net worth) remained 1:3.

The possible presence of current debt as illustrated above is at least partly responsible for the usually stricter standard for the capital structure proportion for industrial and retail businesses (see p. 41). The illustration above is more or less typical of an actual industrial or retail business and it suggest that the minimum figure for the ratio of tangible assets to total debt for such concerns is at least two to one. For railroads and other utilities it will be considerably higher.

Working Capital to Funded Debt. Working capital has been previously defined as the excess of current assets over current liabilities (see Chapter II, p. 15). A funded debt comprises all debts the maturity of which is more than one year away from the date of the current balance sheet. A funded debt is also popularly termed a long-term liability.

19 Ibid., p. 161.

20 Investment Bankers Association, Fundamentals of Investment Banking, p.88.

Again, this ratio is normally confined to use in analyzing financial statements in manufacturing and mercantile enterprises. All public service and mining corporations have relatively small current assets because their main revenues are derived from service or sale of fixed assets. A railroad has little money tied up in receivables since all services are paid in cash or within a short period of time, usually five days.

Working capital should always equal or exceed the bonded debt if the bonds are to enjoy investment quality. Roy Foulke of Dun and Bradstreet found;

that the examination of thousands of balance sheets in all lines of industrial and commercial activity has led to the conclusion that rarely, if ever should the aggregate of funded liabilities exceed the net working capital. Where the funded debt is heavier, the relationship invariably is unbalanced. ... Interest and amortization become a burden—often too great a burden to be carried in a world of competitive capitalism, fluctuating sales, and constantly varying gross margins of profit.²¹

Since bonds are often supported by a lien upon a fixed asset and their interest supported by earnings, the usefulness of this ratio seems questionable. However, the bondholders are recognizing two important factors:

1. the greater ease of valuing current assets over fixed asset,
and
2. the virtue of a strong working capital position in supporting interest charges when earnings are temporarily inadequate.²³

21 Guthmann, op. cit., p. 161. It is interesting to note that Allied Chemical and Dye Company and Sears Roebuck and Company both had long-term debts of \$200,000,000 in 1955. Allied Chemical had working capital of only \$170,000,000 or slightly below the desired ratio, whereas Sears had working capital of over \$850,000,000, or a working capital to funded debt ratio of $4\frac{1}{2}:1$. As taken from Allied Chemical and Dye and Sear Roebuck and Company's Annual Reports for 1955.

22 Foulke, op. cit., p. 267.

23 Prime, First Edition, op. cit., p. 357.

Plant Turnover. One of the most important tasks of those in charge of financial administration of a business is to determine the proper investment in fixed assets and the financing of their purchases.²⁴ These are the productive assets by which production and distribution are carried on. They are very definitely related to sales. "Every dollar that is invested in fabricating assets or non-current assets can be justified only if that investment results in a sales volume that will be reasonably productive."²⁵

Plant turnover is the ratio of net sales to total fixed tangible assets used in operation. This would exclude intangible assets and investments. This ratio expresses the number of dollars of net sales per dollar of investment in net plant. Two advantages of high plant turnover are:

1. The larger the volume of business with respect to investment, the less is the per cent of net profit on sales required to earn a given rate of return on investment.
2. The company with a low ratio is presumably obliged to spread the fixed expenses resulting from the use of fixed assets, such as depreciation and interest, and generally insurance and taxes, over a relatively smaller volume of business, and consequently is likely²⁶ to be at a disadvantage from a competitive standpoint.

This ratio is designed to reflect the efficiency with which the fixed asset investment has been administered. Three factors which lessen the value of plant turnover are:

1. price level changes - plants may be built at different periods of time
2. operating functions assumed - one company may perform more functions than a similar company
3. depreciation reserves - differences in depreciation policy.²⁷

24 Howard and Upton, op. cit., p. 214.

25 Wall and Duning, op. cit., p. 137.

26 Guthmann, op. cit., p. 162.

27 Ibid., pp. 162-164.

These three factors along with the wide variation in the character of industrial operations make "industry" standards unobtainable. The value of plant turnover lies in the comparison over a period of years to determine whether the company is progressing by obtaining more dollars of sale per dollar of net plant investment. A downward trend would raise the suspicion that the plant is overvalued.²⁸ An illustration of the "historical" standard for the plant turnover of American Viscose Corporation is illustrated below.

	<u>1955</u>	<u>1954</u>	<u>1953</u>
Net sales for the year (millions) (a.)	\$260	\$218	\$229
Fixed assets less depreciation at end of year (millions) (b.)	122	127	134
Ratio of net sales to net fixed assets (a:b)	2.13	1.72	1.70

Source: American Viscose Corporation,
Annual Report - 1955

This concludes the discussion of several of the most significant ratios used in analyzing the non-current section of the balance sheets. The four ratios discussed above are by no means the only useful ones available. Several ratios which were excluded from this discussion because of inherent weaknesses or other disadvantages will now be reviewed briefly. These include mortgage asset to secured fixed debt, accumulated depreciation to depreciable assets, surplus to capital stock, and net worth turnover.

Mortgage assets to secured fixed debt. This ratio of mortgaged fixed assets to secured bonds is usually difficult or impossible to figure. This is especially true when a variety of many different types of liens prevail. Generally, the ratio of fixed assets to total mortgage debt should exceed two for industrials and one and one-half for utilities.²⁹

28 Prime, (Second Edition), op. cit., p. 352. Again the factors listed above are in effect.

29 Guthmann, op. cit., p. 162.

Accumulated depreciation to depreciable assets. The size of this allowance for depreciation and the rapidity of its growth are often informative especially when compared with the performance of other similar businesses. There certainly can be no "industry" standard with which to compare this ratio and historical standards are not always too meaningful. However, concerns engaged in the same line of business do have comparable depreciation rates which are compiled and made available to interested persons.

Surplus to capital stock. The ratio of surplus to capital stock is intended to show the degree of conservatism of the management. The larger the ratio the more conservative the management. However, surplus is accumulated from many sources besides retained earnings and this and the age factor of a company render this ratio useless.

Net worth turnover. The ratio of net sales to tangible net worth indicates the activity of the investment in a business. If the ratio is too much larger than that of competitors, then the company is guilty of "overtrading." Overtrading is a condition in which any company attempts to finance a volume of business too great in comparison to its own capital. It is generally accompanied by excessive borrowing and volume sales of thin profit margin.³⁰ Then again, if the ratio of sales to net worth is far below the usual, a condition of undertrading prevails and the company³¹ is criticized of "dying of dry rot."

Therefore, it is difficult to determine what the ratio means. "It is one of those mixed ratios reflecting such opposite things that its movement

30 Wall, op. cit., p. 136.

31 Idem.

in either direction might be favorable (or unfavorable)."³² The adequacy of net worth is best determined by the ratio mentioned earlier in this chapter (see p. 39) and whether or not it is being properly employed is reflected by the earnings.

Summary. This chapter presented an analysis of the fixed section of the balance sheet, particularly of items which are generally used in ratio analysis. No attempt was made to describe all accounts, either asset or liability, which normally appear in a balance sheet of an industrial or mercantile corporation. The ratios which are presented in this chapter as being indicative of financial condition are:

1. Fixed debt to net worth
2. Tangible assets to total debt
3. Working capital to funded debt
4. Plant turnover

Ratio analysis has been strengthened by the forces of governmental supervision, especially with regards to full and fair disclosure. The presentation of from five to ten year summaries of balance sheet and income statement statistics in current annual reports enable the analyst to trace changes, develop trends, and to establish a "historical" standard for the corporation.

32 Guthmann, op. cit., p. 166. Also see Foulke, op. cit., pp. 386-414.

CHAPTER IV
ANALYSIS OF INCOME STATEMENT

The preceding two chapters dealt with an analysis of the balance sheet. This chapter will be concerned with an analysis of the income statement, giving special consideration to significant ratios.

Again, a brief explanation of the nature of the income statement is necessary. Since the primary reason for a business to exist is to earn a return on investment, the income statement is usually given primary consideration by all interested persons. A company's management and its investors are the two groups most concerned with the profitableness of past and future operations. Creditors have more than a passing interest thereto.

Although the income statement is considered to be the most important financial statement, it should be realized that both the balance sheet and income statements are essential to a well-rounded view. For instance, high earnings may be achieved by incurring heavy excessive debt or through the sale of fixed assets owned by the company.¹ In many instances such actions impair the future earnings of a company.

1 The use of borrowed funds (or preferred stock) is known as trading on equity. The primary reason for trading on equity is the anticipation of employing these funds at a rate of return higher than their cost. Many railroads overissued debt instruments during their infant stages to the point of financial instability and insolvency. Others still operate under the ill effects of heavy debt issues of past years. See Guthmann and Dougall, op. cit., pp. 102-104, 272-273, 598-604. Also see Jordan and Dougall, Investments, pp. 431-438.

"Net income is the excess of income over expired costs."² Operating income or revenue is derived through the sale of products or services. From this amount is subtracted the cost of sales and other general expenses including income taxes. This difference between income (or revenue) and expense is the profit or loss for the fiscal period. Unlike the balance sheet, the income statement relates the financial happenings during a period which occurs between two dates, which for a yearly report are the beginning of the fiscal year and its end.

Net income is a vitally important figure and one upon which many decisions are based. And yet most textbooks agree that

an income figure is an approximation, partly the product of facts objectively determined, partly the product of accounting policy decisions, and partly the product of judgment and estimate ... the area of acceptable accounting alternatives is so extensive that one should not attribute too much precision to the income-determination process.³

There are many factors which contribute to the difficulty of computing net income. Among these are the conflicting theories and practices regarding net income, depreciation and maintenance policies, and method of valuing inventory. By no means are the above factors all that exist, but these are sufficient to convey the point desired here.

First, there are two major schools of thought holding two different opinions regarding what items should be included in the income statement for the fiscal year. One group supports the "clean surplus" theory, and the

2 Finney and Miller, op. cit., p. 598.

3 Ibid., pp.612-613. For a more complete understanding of the factors involved in determining net income read pages 596-614.

4

other, advocates the "current operating" concept of net income. The first group maintains that all elements of income, profits, expenses, and losses should be entered in the income statement, with the extraordinary and correction items properly described and segregated. In this way, the earned surplus will be void of any expense or income transactions made during the year and the income statement will be all-inclusive. This is especially important since the average investor concentrates his analysis almost entirely on the income statement and the "net income" per share for the current year. The S.E.C. and the American Accounting Association are among the supporters of this theory.

The second group are advocates of the current operating concept of net income who insist that the income statement should be concerned only with items of income and expense that are applicable to the regular operations of the current period. The American Institute of Accountants advocate this theory. Therefore, even the fundamental principles involved in determining net income are not absolute and the net income reported by a company depends upon its adopting either one plan or the other.

Maintenance and depreciation policies of corporations have a direct effect on the net income computation. "Maintenance expense is the expenditures made to keep the property, plant and equipment in good operating condition."⁵ Railroads have an unusually large maintenance expense. During 1956, the Seaboard Railroad expended over one-fourth its total

4 Ibid., pp. 111-116.

5 John H. Prime, Second Edition, op. cit., p. 386.

6

operating revenues for maintenance expenses. The Reading Company paid out almost one-third of its operating revenues for maintenance.⁷ Maintenance charges of industrials are not nearly as large as these amounts but in any event they are very material expenses. And yet, in years of poor earnings, many companies neglect the care of fixed properties in order that net income (and working capital) be impaired as little as possible and in good years they may or may not treat the property in the opposite manner.⁸ If the Reading Company could have "delayed" to future periods as little as one-sixth its maintenance charges its net income (before taxes) would have been increased by over seven million dollars. The ability to "window dress" net income for a current period is sometimes affective in attracting badly-needed cash through the sale of securities and extension of credit.

As was explained in Chapter III, depreciation is a charge against income for that portion of fixed assets which was ultimately "sold" to customers during the fiscal year. Depreciation is spread over the estimated life of the asset. Since the proper allowance for depreciation is a matter of judgment and estimation and not fact, it is not surprising that depreciation policies differ substancially in businesses in the same industry or productive line. Depreciation is significant to the investor in its

6 Maintenance of equipment, way and structures exceeded \$43,000,000. Total railway operating revenues equalled \$162,000,000. Annual Report for 1956, Seaboard Railroad, p. 26.

7 Maintenance of equipment, way and structures exceeded \$44,000,000 and total operating revenues were \$138,000,000. Annual Report for 1956, Reading Company, p. 16.

8 Guthmann, op. cit., p. 217.

relation to the balance sheet as a valuation reserve, and the income statement; and because it is a material charge against income, it should be examined closely. However, the investor is not in a position to determine the adequacy of depreciation rates for each individual asset and usually, the best he can do is

1. to compare the annual depreciation rate with that used by other companies in the same industry as a basis of judging adequacy or inadequacy of the total annual depreciation charge, and
2. to determine whether the company has altered its depreciation policy by increasing or reducing the total annual depreciation charge relative to the assets being depreciated.⁹

In many instances the company's management depreciates assets too rapidly and as a result net income is suppressed during the early years and overstated in later years when the assets are fully depreciated. This is often misleading to the analyst who is computing industry and historical (trend) ratios.

The method of inventory valuation has a direct effect on cost of goods manufactured and sold; and therefore, on net profit. The use of the LIFO (last-in -- first - out) method of inventory valuation was mentioned in Chapter II with regards to its effect on inventory and current assets in the balance sheet. In the period of continuing inflation which has prevailed since the last major war, company sales, net profit and taxes have been greatly inflated. To help curb this undesirable situation, many

9 Prime, op. cit., p. 398.

10 However, there is much justification in the early "timing" of depreciation. A tax savings may arise when post-emergency tax rates are less than the rates during the emergency. In addition, early depreciation often provides savings on interest and interest earned on funds provided by depreciation. A thorough presentation is found in Louis Goldberg, "The Financial Value of Early Tax Deductions for Depreciation," Accounting Review, V. 30, No. 3 pp. 515-518, July, 1955.

companies have adopted LIFO as a means of charging current (inventory) costs against current revenue. This has helped to present a more realistic income figure and at the same time income taxes have been decreased.

The General Electric Company adopted the LIFO method of valuing inventories effective January 1, 1955. As a result of this new procedure, the Company's net earnings were reduced by twenty million dollars and a considerable amount of income tax was avoided.¹¹ But in doing so, it has destroyed comparability between companies which use LIFO and those which use other acceptable methods. Comparability is disrupted even within similar industries where it is widely used, chiefly because of

1. the adoption of the method by different companies in different years and so at different initial price levels,
2. the application of the method to different portions or departments of their business (companies use more than one method) and,
3. different rates of company growth so that varying proportions of their inventories are valued at the several price levels of the different years of the past.¹²

These are only a few of the many prevailing factors which materially affect the figure reported as net income. And yet, some large corporations still submit annual reports in which sales, expenses and net income are stated at decimal figures. (i.e. The 1949 income statement for the Studebaker Corporation stated sales at \$473,706,099.84, less expenses of \$428,922,223.87 and net income of \$27,563,875.97.) The means by which a

11 General Electric, Inc., Annual Report for 1955, p. 22.

12 Guthmann, op. cit., pp. 118-119.

corporation's net income can be manipulated are many. However, much credit must be given to such groups as the American Institute of Public Accountants, the American Accounting Association, the New York Stock Exchange, the Securities and Exchange Commission, and Certified Public Accountants in their efforts toward more uniform accounting and reliable financial statements. Again, the federal government and its revenue agents are very influential in seeing that good financial accounting provides a truthful income statement upon which taxes are levied.

There are many ratios used in analyzing the income statement. For purposes of this discussion, the following ones are representative of the ratios most commonly used and accepted:

1. gross profit ratio
2. operating ratio
3. times interest earned ratio
4. net income to sales ratio
5. net income to tangible net worth ratio
6. net income per common share ratio
7. net income to dividends ratio

These ratios will now be discussed in some detail.

Gross profit ratio. Gross profit is derived by deducting the cost of goods sold from the amount of net sales. The gross profit ratio is the ratio of gross profit to net sales. This percentage of net sales is a most valuable figure in comparative analyses of businesses engaged in the same line of

13 In a comprehensive volume entitled Security Analysis eight chapters are devoted to the analysis of the income account. Their primary objective is to acquaint the reader with those "artifices" and "window dressing" devices designed to misrepresent earnings and to conceal losses. Every investor and analyst should realize that net profits have been and still are subject "in extraordinary degree to arbitrary determination and manipulation." See Benjamin Graham and David L. Dodd, Security Analysis, Chapters 31-38.

14

business as well as a historical analysis of an individual concern. A
 historical analysis of the gross profits of Reynolds Metal Company is
 shown below.

	Years Ended December 31 (in thousands of dollars)				
	<u>1953</u>	<u>1952</u>	<u>1951</u>	<u>1950</u>	<u>1949</u>
Net Sales	\$287,893	\$234,739	\$215,705	\$166,925	\$131,865
Cost of Products Sold	212,308	169,360	146,002	122,612	108,358
Gross Profit	<u>\$ 75,585</u>	<u>\$65,379</u>	<u>\$ 69,703</u>	<u>\$ 44,313</u>	<u>\$ 23,507</u>
Gross Profit Ratio	27%	28%	32%	26%	18%

Source: Reynolds Metals Company
Annual Report for 1953

Reynold's gross profit ratio has greatly improved since the year 1949. Assuming that all other operating expenses remain relatively unchanged, then Reynold's net operating profit will have been increased accordingly, which it in fact did. Then, this ratio answers the question, "Is the markup on cost to selling price sufficient to show a profit in a highly competitive business world."¹⁵

The importance of a certain minimum of gross profits from a competitive point of view has been explained as follows:

Within certain limits there is a natural gross profit in every line of merchandising and manufacturing. By "natural" gross profit we mean that under ordinary business conditions staple materials and merchandise in any given standard can be acquired and sold at about the same cost and price by those in that line who possess about the same amount of ability. In some lines the resulting gross profit is large, in others small; but in each

14 For data on gross profit margins in various fields of retailing, see Walter L. Mitchell, Jr., Standard Ratios for Retailing, (New York: Dun and Bradstreet, Inc., 1940).

15 Foulke, op. cit., p. 500.

line the ordinary market conditions are available to all engaged in that line. If there are 100 manufacturers in a certain type of business, some will be found with greater ability than others; also some may have insufficient capital, so that the gross profit may be greater or less in certain plants than in others, and the average gross profit of the hundred will not be as large as what we call the "natural profit" of those possessing reasonable ability and capital. The importance of an accurate calculation of the gross profits rests upon the fact that if any given business concern cannot earn the natural gross profit, or at least exceed the average of all engaged in the line, it will not become a success. Whether or not the gross profit of a good year is satisfactory, if the percentage of gross profit to cost or to sales may be relied upon, comparison of the results of the current period with others provides information which should explain the causes for the increase or decrease in the amount of the gross profit.¹⁶

Quite naturally, the concerns with the higher percentage gross profits should be expected to yield the higher percentage net profits.

Higher gross profits are one of the primary reasons for the success of consolidated enterprises. The ability to buy raw materials and finished goods at cheaper prices greatly reduces the cost of goods sold and increases the profit spread. This "buying advantage" is so great that at times federal legislation is passed to stimulate a more competitive situation.¹⁷

The gross profit ratio is frequently used in estimating the value of inventories, although unusual care must be taken when the LIFO method of valuing inventory is in effect. The usual method of estimating the value of inventory is to ascertain the average percentage of gross trading profit

16 Herbert G. Stockwell, How to Read a Profit and Loss Statement, pp. 123-124.

17 Charles F. Phillips and Delbert J. Duncan, Marketing Principles and Methods, pp. 182, 716-718.

over a period of years based upon sales. The amount of gross trading profit may then be found by multiplying the net sales by the rate of gross profit. It is necessary now to deduct this amount from the net sales to find the cost of the goods sold. And finally, the cost of the goods on hand at the beginning of the period, plus the cost of the goods purchased (or manufactured) during the period, less the cost of the goods sold, will be the estimated value of the goods on hand at the end of the period. It must be assumed that the per cent of gross profit should be approximately the same in several successive periods and that current operations are maintained on a normal basis.

To illustrate, assume the following data:

Inventory - January 1	\$20,000
Purchases for the year	\$80,000
Net sales for the year	\$104,000
Average gross profit for 5 years	25%

What should be the approximate inventory on December 31?

Inventory - January 1		\$ 20,000
Purchases		80,000
Total		<u>\$100,000</u>
Deduct approximate cost of goods sold	\$104,000	
Sales		
Less estimated gross profit		
25% of \$104,000	26,000	78,000
Approximate inventory - December 31		<u><u>\$ 22,000</u></u>

18 This is one of the methods used by certified public accountants in auditing the financial condition of a concern. It is used as a check against the client's understating book inventories in an attempt to reduce net profit and taxes. This method is also valuable in case of fires which destroy all records and in checking against inventory pilferage. Refer to Roy T. Culey and Royal D. M. Bauer, Auditing, pp. 223-241.

Finally, the investor is interested in the gross profit ratio as it reflects the historical trend of a company and as it deviates above or below the industry standard. A relatively good gross profit usually indicates good net earnings. This may not always be true, especially in a manufacturing concern when many operating expenses are included in the cost of the goods sold at the discretion of the cost accountant or in accordance with cost procedure.¹⁹ In any case, the gross profit ratio should be supplemented by the operating ratio.

Operating ratio. The operating ratio is the ratio of operating expenses to net sales or revenues. The cost of goods sold is included in the operating expenses but income taxes are excluded. The formula for the operating ratio is:

$$\frac{\text{Operating Expenses} + \text{Cost of goods sold}}{\text{Sales}} = \text{Operating Ratio}$$

The ratio indicates the expenses incurred per dollar of net sales revenue. The remainder of the sales dollar is available for interest charges, income taxes and return on investment.²⁰ A ninety per cent operating ratio would leave ten per cent to be distributed between interest, taxes, and dividends.

Since a high return on investment is always a desired goal, a low operating ratio is desirable. "This ratio is commonly used to measure the operating efficiency of the management on the theory that efficient management results in a stable or decreasing operating ratio."²¹

19 Myer, op. cit., p. 125.

20 Interest expense is often included in the operating expenses in computing the operating ratio.

21 Prime, Second Edition, op. cit., p. 438.

The operating ratio may be a valuable tool to management, especially if the corporation's ratio is higher than the industry standard. The trend of the operating ratio may be more significant than the actual operating ratio at any one time. A trend toward higher ratios might be corrected through cost analysis.

Operating ratios differ substantially in the various industries and even within concerns engaged in the same line of business. And, in those businesses where investment is very small in relation to sales (i.e. personal services such as beauty parlors, repair shops, and restaurants) a high operating ratio might still permit a high return on the small investment. This ratio would have to be lower in merchandising, when more capital is needed, and still lower in manufacturing; and in the public service industries and real estate, where the customer is primarily buying the services of capital, the operating ratio has to be relatively low if it is to provide an adequate return.

The following figures are typical of the differences in operating ratios between utilities, industrials, and merchandising businesses.

	1956	1955	1954	1953
Virginia Electric & Power Co.	76.5%	76.4%	77.5%	79.1%
Seaboard Railroad	74.3	72.2	73.1	72.0
Chesapeake & Ohio Railroad	67.9	68.1	74.0	72.2
Allied Chemical and Dye	87.7	84.7	86.3	84.7
American Viscose Corporation	N.A.	80.4	89.3	88.5
Colonial Stores, Incorporated	N.A.	96.9*	97.1*	96.8* ²⁴

(*approximate)

22 Guthmann, op. cit., p. 207.

23 Idem.

24 As computed from annual reports for the years 1955 and 1956.

American Viscose Corporation whose operating ratio decreased almost nine per cent during 1955 had an increase in net income from \$10,500,000 in 1954 to \$24,700,000 in 1955.

The operating ratio must be considered in the light of capital structure. A business that borrows heavily must have a lower operating ratio and another that is financed mostly from equity capital may operate profitably on a narrower margin of profit.

A suitable ratio used in connection with the operating ratio would be the sales to total assets (investment turnover) ratio. For example, if the investment turnover is one-hundred per cent when the operating ratio is eighty per cent and the sales revenue \$100,000, and the turnover declined to fifty per cent, the same operating ratio of eighty per cent would produce \$10,000 instead of \$20,000. If total assets were \$100,000, then the \$100,000 of sales would yield a plant turnover of one-hundred per cent. Thus, when sales declined to \$50,000, even with the same operating ratio (eighty per cent), plant turnover declined to fifty per cent, and instead of a net income (disregarding taxes) of twenty cents per one dollar²⁵ invested, net income would be only ten cents per one dollar invested. Therefore, an invested dollar yields more if the plant turnover is greater, even though the operating ratio remains the same.

The operating ratio is subject to distinct limitations. A rising ratio should reflect decreased efficiency, yet it may reflect the effects of a

²⁵ As illustrated and explained in W. Bayard Taylor, Financial Policies of Business Enterprise, pp. 564-565.

business depression or other external and uncontrollable conditions beyond management's control. "On the other hand, while theoretically a decrease in the ratio would reflect greater efficiency, it may actually reflect a deliberate curtailment by the management of such variable expenses as maintenance or depreciation in an effort to report a more favorable operating profit."²⁶ And, a company may show a favorable operating ratio and still be in an unfavorable financial position because of heavy fixed (interest) charges.

Times-interest earned ratio. "The most widely used ratio in bond analysis is the times-interest earned ratio - that is, the ratio of annual earnings to the amount required annually for interest payments."²⁷ This is simply a comparison between the earnings as the amount of funds available and interest as the amount of funds required. And, the larger the ratio, the greater is the financial ability of the issuer to meet its fixed charge payments,²⁸ and the higher is the grade of the bond issue.

Since the most common measure of future prospects is the record of past performances, a common rule is that earnings (after income taxes) in the years immediately prior to the date of bond financing should be equal to at least three times the interest charges to be assumed, and even higher

26 Prime, Second Edition, op. cit., pp. 438-439.

27 Harry C. Sauvain, Investment Management, p. 198.

28 Idem.

when the interest rate is somewhat low. The question the bond-market analysts seek to answer is: "Can this corporation show a comfortable margin of earnings in ordinary years and avoid default in the worst years?"³⁰

A stable margin of safety is more desirable than a wide margin which fluctuates.

The following partial income statement of the American Telephone and Company Telegraph/is typical of the provision for fixed charges of most utilities:

Net Operating Revenues	\$1,762,407,626
Operating taxes	
Federal taxes on income	626,939,691
Other taxes	414,477,922
Total operating taxes	<u>\$1,041,417,613</u>
Net Operating Income	\$ 720,990,013
Other income	
Dividends from subsidiaries not consolidated	44,110,070
Proportionate interest in earnings (after dividends of subsidiaries not consolidated)	20,347,422
Dividends from other companies	6,632,372
Miscellaneous income	29,791,326
Less: Miscellaneous deductions from income	6,988,380
Income Available for Fixed Charges	<u>\$ 814,882,823</u>
Fixed Charges	
Interest on funded debt	123,250,263
Other interest	8,545,942
Less: Release of premium on funded debt - net	456,831*
Net Income	<u><u>\$ 683,543,449</u></u>
* credit	

Source: American Telephone and Telegraph Company
Annual Report for 1955

29 Guthmann and Dougall, op. cit., p.222.

30 Idem.

The times-interest earned ratio of A.T. & T. can now be determined from the income statement on page 62.

	<u>Amount</u>	<u>Times Earned</u>
Income Available for Fixed Charges	\$814,882,823	
Interest on Funded Debt (less premium)	122,793,432	6.63
Balance	<u>\$692,089,391</u>	
Other Interest	8,545,942	6.21
Net Income	<u><u>\$683,543,119</u></u>	

For purposes of illustration the item Interest on Funded Debt was treated as though it had priority over the item Other Interest, just as interest on first-mortgage bonds would have priority over interest on second-mortgage bonds. It is a conservative practice to compute times-interest earned ratios on net income after income taxes.

Where more than one issue of bonds is considered all the fixed charges of preceding issues must be considered or else the "times-earned" figure may be misleading. "By this overall method of stating the coverage of successive claims upon earnings, a series of figures will be had which will measure the relative financial strength of the several issues." ³¹ The following will illustrate this point:

	<u>Amount</u>	<u>Times Earned</u>
Income Available for Fixed Charges	\$5,000,000	
Interest on First-Mortgage Bonds	500,000	10.00
Balance	<u>\$4,500,000</u>	
Interest on Second-Mortgage Bonds	500,000	5.00
Balance	<u>\$4,000,000</u>	
Debentures	1,000,000	2.50
Balance	<u>\$3,000,000</u>	
Interest on Preferred Stock	100,000	2.39
Available for Common Stock	<u><u>\$2,900,000</u></u>	

31 Guthmann, *op. cit.*, p. 229.

Net income to sales ratio. There was once a period when the theory of a large volume to a small profit was almost a national motto. Today, there is almost widespread belief that the volume of sales is the most important element in obtaining net profits. This viewpoint was aptly stated by Charter Harrison who said:

The primary factor in profits is sales volume, and the value of increased sales volume per dollar of sales, due to these increased sales not adding to fixed charges, is far greater than any additional selling expense which would be required, in the majority of cases and under normal conditions.³²

Volume sales are based on the theory that every business has what is known as the break-even point.³³ Net sales below this point result in a loss. And, net sales above this point result in increasing net profits because only small variable expenses have to be covered, fixed expenses having been already provided for. "This fact is so obvious to those managing an enterprise that attention is usually focused upon sales before most other matters."³⁴

The number of dollars of sales is but a superficial and often erroneous measure of success. The Armour Company is a good example of a good-sales poor-earnings company. In 1954 Armour ranked seventh in sales among the five hundred largest corporations but it earned less than one per cent net profit on sales, to rank 440.³⁵ And, "if the profit of the five hundred

32 G. Charter Harrison, What! No Reports at All, Mr. Knudsen?, p. 9 as quoted from Foulke, op. cit., p. 567.

33 A good illustration and analysis of the break-even point can be found in Myer, op. cit., pp. 128-132.

34 Ibid., p. 124.

35 "Box Score of Big Business," (Editorial), Fortune, V. 52, p. 96, July, 1955.

corporate giants are related to their sales or assets or considered on any other ratio basis, the very biggest companies cease to be the top performers."³⁶

Therefore, it is necessary to measure not sales, but the profitableness of the sales. This measure is provided by the ratio of net income to sales. Texas Gulf Sulphur Company was rated only 332 in sales but it netted a whopping thirty-six per cent net profit on sales to top the profitability list.³⁷

And even though profits are an economic end to any business, a business cannot be operated solely for the maximum of immediate profits. The proportions of its balance sheet, the size of its liabilities, condition of its receivables, and the amount of merchandise must simultaneously be kept in healthy relationships to working capital and tangible net worth.³⁸ The schedule below indicates the significant differences in the ratio of net-profit on net sales between industrials, wholesalers, and retailers in 1955.

Net Profits on Net Sales

<u>Line of Business</u>	<u>Per Cent</u>
<u>Manufacturing</u>	
Auto Parts and Accessories	3.80
Chemicals, Industrials	6.04
Cotton Cloth Mills	2.71
Drugs	8.72
Machinery, Industrials	3.38
Paper	6.81
Petroleum, (Integrated operators)	8.59

36 Idem.

37 Idem. The good showing by the Texas Gulf Sulphur Company has been noticed by investors and now it has more stockholders (40,000) than all but forty-nine of the five hundred biggest companies.

38 Foulke, op. cit., p. 566.

<u>Wholesale</u>	
Auto Parts and Accessories	1.71
Cigarettes and Tobacco	0.36
Drugs and Drug Sundaries	1.70
Furnishings, Men's	2.70
Hardware	1.81
Paper	1.12
Shoes	1.01

<u>Retail</u>	
Clothing, Men's and Boys'	3.91
Department Stores	2.06
Furniture, Installment	3.09
Hardware	1.69
Shoes	1.83

Source: Dun and Bradstreet, Inc.,
Fourteen Important Ratios
In 72 Lines of Business,
1955

As expected, industrials earn more profits per sales dollar than do retailers, and both earn more than wholesalers. Quite naturally, those enterprises that show percentages considerably above the average or industry standard, and those whose ratios show a favorable historical trend, are more highly regarded than the concerns on par with, or below the standard. Stability of earnings on sales is another highly desirable trait.

Net profits to tangible net worth ratio. The amount invested in a company by its stockholders is entitled to a reasonable return. And, a large profit in itself is no true measure of a company's success.

It is the relationship which net profits bear to tangible net worth or stockholders' equity that measures the true success of a company's earnings. As previously defined, tangible net worth is the sum of all outstanding preferred and common stocks, surplus, and undivided profits, less any intangible items in the assets.

This ratio measures the success or failure of management and its use of invested funds, especially in relation to other concerns in the same

industry. The ability to attract sufficient equity capital into new and expanding businesses is always based on the ability to earn adequate profits. It is natural that when profits are relatively high in a particular line of business, more new concerns are organized to help reap the rewards.

Standards of net profit on tangible net worth have been compiled by various businesses and industry and trade associations for many years. The schedule below is for a few selected lines of business activity.

Net Profits on Tangible Net Worth

<u>Line of Business</u>	<u>Per Cent</u>
<u>Manufacturing</u>	
Airplane Parts and Accessories	4.34
Auto Parts and Accessories	12.40
Breweries	3.19
Contractors, Electrical	9.37
Drugs	15.25
Machinery, Industrial	8.66
Paper	10.76
Petroleum, Integrated	12.17
<u>Wholesale</u>	
Cigarettes and Tobacco	4.45
Dry Goods	3.78
Hardware	5.76
Lumber	6.30
Paper	6.52
Wines and Liquors	5.23
<u>Retail</u>	
Department Stores	5.80
Dry Goods	10.75
Furniture	6.54
Groceries and Meats, Independent	11.31
Shoes	5.96

Source: Dun and Bradstreet, Inc.,
Fourteen Important Ratios
In 72 Lines of Business,
 1955

Net income per common share ratio. The previous ratio showed the relationship of net income to the total net worth. The ratio of net income earned per share of common stock is even more meaningful to the investor since it emphasizes clearly the degree to which income was earned on his investment.

A simple set of rules used to compute net income per share of common is:

1. Determine final net income figure
2. Subtract preferred dividends (if any) from net income
3. Divide total number of shares of common outstanding (at end of year) into this balance

Unless net income per share of common is computed by the corporation some confusion results. A common error made by investors is to omit subtracting dividends on preferred stock (step 2) before computing earnings per share of common. Often too, the number of shares of common outstanding is not stated clearly, if at all.

Since ownership in equity of American corporations appears to be constantly increasing and a greater part of this increase represents the untrained investor serving his apprenticeship in the fine art of investment, it is necessary for the corporate management to do all in its power to see that stockholders obtain the information they desire. ⁴⁰ Many stockholders have neither the time nor training to properly analyze financial statements,

⁴⁰ W. F. Stanley, "Financial Statements Should Report Earnings and Dividends Per Share," The Journal of Accountancy, V. 91, No. 4, p. 566, April, 1951. An opposite viewpoint is expressed by J.E. Robertson of Haskins and Sells, who states, "There is oversimplification in a subject (income) which is in itself quite complex. The general presentation of earnings per share would be a case in point." Ibid., pp. 568-569.

"but if they know little else, they know the importance of earnings. And quite rightly, they think in terms of earnings per share." ^{l1} The schedule below illustrates a good historical presentation by Allis Chalmers of net earnings, and its partial distribution thereof.

<u>Record of Progress</u>						
Common						
<u>Year</u>	<u>(Thousands of dollars)</u>		<u>Shares Outstanding*</u>	<u>Per Share - Common Stock</u>		
	<u>Sales</u>	<u>Earnings</u>		<u>Earnings*</u>	<u>Dividends*</u>	<u>Book Value*</u>
1956	\$547,439	\$20,355	8,141,435	\$2.42	\$2.00	\$34.88
1955	535,069	24,805	7,888,724	3.03	2.00	34.67
1954	492,948	26,130	6,950,754	3.60	2.00	34.09
1953	514,474	21,943	6,534,418	3.29	2.00	32.79
1952	513,641	24,457	5,910,676	3.99	2.00	31.61
1951	457,060	22,416	5,190,204	4.10	1.75	30.01
1950	343,698	23,119	5,033,648	4.36	1.625	27.72
1949	351,097	18,755	5,031,124	3.50	1.00	24.99
1948	328,101	15,441	5,031,124	2.84	0.80	21.50
1947	211,949	5,442	5,031,124	0.85	0.80	19.75

(* adjusted for two-for-one split in June, 1956.)

Source: Allis Chalmers,
Annual Report
for 1956.

Net income to dividends ratio. Corporate management is obligated to the shareholders, as owners of the business, to pay out a reasonable amount of net earnings as compensation for the use of capital. The amount of dividends declared and paid each year depends to a large extent upon net earnings, the condition of working capital, and the temperment of management.

American corporations which in 1939 paid out close to seventy-five per cent of their earnings in dividends were paying out less than fifty per cent

in 1954.⁴² Heavy capital expenditures, increased costs and high taxes are several of the major reasons why more earnings are now being retained in businesses.

The ratio of net income to cash dividends (dividend payment test) gives some indication of the amounts paid out to investors and the amount reinvested in the business, especially when computed for an extended period. As expected, the higher the ratio the more popular the business would be with investors, providing net profits were adequate. A creditor would hope for a low income to dividend ratio because otherwise, working capital might be impaired. And, although a bondholder might feel somewhat indifferent to this ratio, as long as interest was being earned an adequate number of times, it must be remembered that a large capital stock and earned surplus provide a "cushion" of safety for him. The larger the cushion, the safer are the bonds in case of insolvency.

The importance of these last two ratios can be summarized as follows:

The earnings produced for the common stock during a given period and the estimate of those earnings in the future are the most important single factors of interest to the owners of that stock, and the most important single determinants of its value. The investor must be satisfied that these earnings are commensurate with the risks of the enterprise; and it is the amount of these earnings that determines primarily the dividends that he can expect to receive. The dividends payment test involves an inquiry into the dividend record of the company over a period of years; the amount of earnings available for dividends, and the proportion of those earnings that has been and may in the future be distributed in dividends.⁴³

⁴² Council of Economic Advisors, "Corporate Profits," Economic Indicators, p.22, April, 1954, as found in Funston, op. cit., p. 5.

⁴³ Jordan and Dougall, op. cit., pp. 392-393.

The companies listed below have outstanding dividend records based on longevity.

Selected Companies With Unbroken Dividend Records
In 1951 (at least 40 years)

<u>Company</u>	<u>Business</u>	<u>Since</u>	<u>Years</u>
1. National City Bank (New York)	Banking	1813	139
2. Pennsylvania Railroad	Railway	1848	104
3. Peppercill Manufacturing	Textiles	1852	100
4. Continental Insurance	Insurance	1853	99
5. Scoville Manufacturing	Metals	1856	96
6. Pennsylvania Salt	Chemicals	1863	89
7. Parke, Davis	Drugs	1878	74
8. American Telephone & Telegraph	Telephone	1881	71
9. Diamond Match	Matches	1882	70
10. Standard Oil (N.J.)	Petroleum	1882	70
11. Consolidated Edison (New York)	Electricity	1885	67
12. Commonwealth Edison	Electricity	1890	62
13. Procter and Gamble	Soap	1891	61
14. Coca-Cola	Beverage	1893	59
15. Standard Oil (Indiana)	Petroleum	1894	58
16. General Mills	Flour	1898	54
17. General Electric	Electricity	1899	53
18. National Biscuit	Bakery	1899	53
19. Standard Brands	Food	1899	53
20. United Fruit	Fruit	1899	53
21. Union Pacific	Railway	1900	52
22. Eastman Kodak	Chemicals	1902	50
23. Texas Company	Petroleum	1902	50
24. E. I. duPont de Nemours	Chemical	1904	48
25. American Tobacco	Tobacco	1905	47
26. National Lead	Lead	1906	46
27. Detroit Edison	Utility	1909	43
28. May Department Store	Retailing	1911	41
29. Socory - Vacuum	Petroleum	1911	41
30. F. W. Woolworth	Merchandise	1912	40

Source: David F. Jordan and Herbert E. Dougall,
Investments, p. 393.

This concludes the discussion of several outstanding ratios used in the analysis of the income statement. However, brief mention should be made of several other common ratios. These are the ratios of sales to fixed assets, net sales to tangible net worth, net sales to working capital, net profit to tangible assets and a percentage analysis of the income statement.

Sales to fixed assets. The ratio of sales to fixed assets can be found by dividing the net annual sales by the total of the amount of non-current or fixed assets. "The result indicates the sales productivity of fixed assets expressed by the relation of sales to the money invested in fabricating, trading, or non-liquid assets."⁴⁴

Since capital is invested in plants and other fixed assets for the purpose of production or trading, the investment must be justified by achieving a proportional sales volume. And as the relation of sales to fixed assets increases, there is likely to exist a condition in which plant investment is increasingly justified and profitable.⁴⁵

Net sales to tangible net worth. The ratio of net sales to tangible net worth indicates the activity of the investment in a business. An extremely high ratio may indicate an excessive volume of sales on a thin margin of invested capital and the overuse of credit.⁴⁶ This is overtrading. Undertrading, the process of handling too small a volume of sales in relation to net worth, is represented by a low ratio of net sales to tangible net worth.

⁴⁴ Wall and Duning, op. cit., p. 140.

⁴⁵ Idem., A more thorough presentation of this ratio can be found in Chapter III, p. 45 of this paper.

⁴⁶ Foulke, op. cit., p. 386.

The solution to overtrading calls for the investment of additional funds in a business to bring the net worth in line with sales. A reduction of sales is another alternative.

Both undertrading and overtrading must be considered in the light of operations by similar businesses. No broad maxim can be given as a guide to the safe limits of the ratio of net sales to tangible net worth but as a general rule, if this ratio is more than twice as large as the median for the particular line of business activity, the analyst should suspect that overtrading is taking place.⁴⁷

Net sales to net working capital. The ratio of net sales to net working capital is complimentary to the ratio described above. It is not unusual to come across a situation where the ratio of net sales to tangible net worth appears satisfactory, but the ratio of net sales to networking capital is excessive. This condition reflects a top-heavy investment in fixed or slow assets, leaving a moderate net working capital.⁴⁸ A low current ratio usually prevails under these circumstances.

The difficulty in using this ratio is that the results are not easily comparable. There is no broad standard. "The ratio of net sales to net working capital which should normally be maintained varies between manufacturers, wholesalers, and retailers, and also between the various lines of business activity in each of these three main types of operation."⁴⁹ It is not easy for an analyst to determine when an unhealthy relationship exists.

47 Ibid., p. 409.

48 Ibid., p. 415.

49 Ibid., p. 432.

The schedule below illustrates typical industry standards compiled for net sales to tangible net worth and net sales to net working capital.

<u>Line of Business</u>	<u>Net Sales to</u> <u>Tangible</u> <u>Net Worth</u> (times)	<u>Net Sales to</u> <u>Net</u> <u>Working Capital</u> (times)
<u>Manufacturing</u>		
Auto Parts and Accessories	2.73	4.60
Breweries	2.51	9.99
Chemicals, Industrial	1.96	3.87
Drugs	2.01	3.13
Meats and Provisions	8.05	16.61
Petroleum, Integrated	1.26	6.02
<u>Wholesale</u>		
Auto Parts and Accessories	3.56	4.73
Cigarettes and Tobacco	14.06	23.75
Drugs and Drug Sundaries	5.51	6.91
Lumber	6.84	9.67
<u>Retail</u>		
Clothing, Men's and Boys'	2.48	3.11
Dry Goods	2.87	4.03
Groceries and Meats, Independent	10.45	22.45

Source: Dun and Bradstreet, Inc.,
Fourteen Important Ratios
In 72 Lines of Business,
1955

Net profit to total assets. Another earnings ratio is computed by dividing net income by the total assets. This ratio is sometimes used by management to check the relative profitableness of investments in its many decentralized branches or departments.

In 1954, the five hundred largest corporations accounted for a total of fifty-six per cent of all assets and sixty-six per cent of net profits. The

Gillette Safety Razor Company earned thirty-seven and one-half per cent⁵¹ net profit on assets to rank number one in that department.

Percentage analysis of the income statement. In a percentage analysis of the income statement all figures are reduced to a common denominator and expressed as a percentage of net sales. This method (common-size statement) has the advantages of:

1. showing changes in the proportions of the statement, which are usually as significant as changes in gross amounts but should be read with the latter
2. reducing the figures to a size which can be more easily comprehended
3. throwing into relief tendencies not so readily apparent in the original figures⁵²

This makes an interesting and vital analysis for management. Costs and expenses of one year can be compared to those of past years and corrective measures can be made wherever needed. Prospective investors and stockholders are more interested in developing trends of sales, gross profit, and net profit. In addition, some individual expenses such as depreciation, maintenance, and interest need to be examined as a percentage of sales for a number of years. In all these analyses, the effects of price changes should not be overlooked.

Summary. The income statement is probably regarded as the most important of all financial statements. And yet, it is subject to many manipulations and arbitrary decisions. Although financial statements have been vastly improved, the analyst should always be aware of their "inherent" limitations. The

51 Idem.

52 Guthmann, op. cit., p. 209.

The following ratios provide a valuable insight into the profitability of a business for the present year especially when compared to the prevailing industry or average standards:

1. gross profit
2. operating
3. times-interest earned
4. net income to sales
5. net income to tangible net worth
6. net income per common share
7. dividends to net income

A historical analysis of these ratios for several successive years can give some indication of the future profitability of a business. The common-sized income statement provides an overall picture of the relationships existing between sales, expenses, and income. In detail, it provides management with an excellent review of relative costs and expenses. Other ratios discussed in this chapter are sales to fixed assets, net sales to tangible net worth, net sales to net working capital, and net profit to total assets.

CHAPTER V

SUMMARY AND CONCLUSION

Summary. The upsurge of the corporate form of organization in the early 1850's stimulated the need for accounting and financial statements. These early financial reports failed to convey adequately the operational and financial conditions of the corporations. The enactment of the Securities and Exchange Commission and the gradual strengthening of reporting requirements by the New York Stock Exchange soon corrected substantially the financial reports of the corporate bodies. In addition, the Revenue Act of 1918 required that approved standard methods of accounting were necessary to clearly reflect taxable income.

Financial statements are of vital concern to many groups of people. Among these are management, bankers and other lenders of money, creditors, and investors. The annual report of today must be a narrative of business activities to a varied audience; and, in this respect, many companies believe that reports are becoming more and more a social document.

Management is the group most concerned with financial reports and statistics. The reflection of past and present performances is shown by these statements and from them, a projected look into the future can be gained. And, it has been long established that the absence of good financial reports is usually the first basic evidence not only of a weakness in the financial policy but also in overall management skill.

Bankers are relying more than ever before on financial data summarized

in annual and interim reports as a basis for making loans. Creditors were among the first to encourage the use of financial statements in making credit investigations. And lastly, investors are keenly interested in and affected by the profitableness of corporations.

The significance of financial statements is difficult to grasp when viewed in its entirety. A much more meaningful analysis can be gained through the use of ratios. The underlying principle of ratio analysis is that the proportion or relation of one item to another is far more important than the amount of each item expressed in dollars. However, in order to be useful a ratio must be based upon a logical and meaningful operational relationship. The types of ratios commonly used in financial statement analysis are:

1. balance sheet ratios
2. income statement ratios
3. mixed ratios

A ratio in itself means nothing. It is only when a ratio can be compared to some gauge or standard that it takes on a meaning. There are certain standards which have been established after many years of compiling statistical data and making comparisons. Although some standards vary little from year to year, all are dynamic in nature and subject to gradual or sudden changes. There are three types of standards to which ratios are compared.

These are:

1. the absolute standard
2. the average or industry standard
3. the historical standard

The absolute standard is valueless for all practical purposes. However, the industry standard which relates the average performance of other business

units in a particular industry or line of business, and the historical standard which relates the past performances of a particular concern, are both valuable in ratio analysis. They are most informative when used together.

This writing is concerned with the ratio analysis of the balance sheet and the income statement. For purposes of analysis the balance sheet may be divided into two distinct sections, one, the current section and the other the fixed section. The current section of the balance sheet contains current items, namely, current assets and current liabilities. Four important ratios used in the analysis of this section are:

1. the current ratio
2. the quick ratio
3. testing receivables
4. inventory turnover

The current ratio is the ratio of current assets to current liabilities. It is probably one of the most widely used of all ratios and it is particularly valuable as an indication of the ability of a concern to meet its current obligations. This ratio normally should never fall below a two to one margin but may exceed this amount substantially depending upon the line of business.

The quick or acid test ratio is the ratio of quick assets to current liabilities. These quick assets normally include cash, marketable investments, and receivables. This ratio is used as a supplement to the current ratio because it indicates the ability of a business to satisfy immediately its current debts.

The testing of receivables is the ratio found by dividing the trade accounts and notes receivable by the average net credit sales per day. It provides a good indication of the condition of receivables.

Inventory turnover is a comparison of the amount of goods sold per year with the stock carried. This ratio is used as a measure of merchandising efficiency and as an indication of inventories being overstocked or understocked.

In summary, the analysis of the current section of the balance sheet is primarily an analysis of working capital position. It is especially informative as to the short-run solvency of a business; a condition which is closely observed by creditors, bankers, and management.

The fixed section of the balance sheet contains those assets of a relatively permanent nature used in the operation of a business and not intended for sale. On the credit side of the balance sheet are those long-term liabilities and equity capital which supply the funds needed to purchase these fixed assets. The ratios which are significant to a preliminary analysis of this section of the balance sheet are:

1. fixed debt to net worth
2. tangible assets to total debt
3. working capital to funded debt
4. plant turnover

The ratio of fixed debt to net worth is designed to determine whether or not a comfortable balance exists between borrowed and owned capital. Fixed debt when overly indulged in becomes a heavy fixed charge on annual income. A general principle is that debt should be kept within such limits that in times of recession insolvency would be improbable. The ratio of tangible assets to total debt provides an indication of the tangible assets which are available for all creditors in case of liquidation.

The ratio of working capital to funded debt is another ratio used to indicate possible overuse of long-term debt or an unsatisfactory working

capital position. Working capital should always equal or exceed bonded debt if the bonds are to enjoy investment quality.

Plant turnover is the ratio of net sales to total fixed tangible assets used in operation. It expresses the number of dollars of net sales per dollar of investment in net plant and is used to reflect the efficiency with which the fixed asset investment has been administered. A high plant turnover is desirable.

The income statement is considered by many to be the most important of all the financial statements. And, net income is the most important single figure in the income statement. Yet, it is commonly accepted that "an income figure is an approximation, partly the product of fact objectively determined, partly the product of accounting policy decisions, and partly the product of judgment and estimate." The external forces composed of the S.E.C., the New York Stock Exchange, Certified Public Accountants, and federal tax authorities have accomplished a great deal in their combined efforts to improve the accuracy and reliability of financial reports, particularly the income statement.

The ratios most commonly used and accepted in the analysis of the income statement are:

1. gross profit ratio
2. operating ratio
3. times interest earned
4. net income to sales
5. net income to tangible net worth
6. net income per common share
7. net income to dividends

Gross profit ratio is the ratio of gross profit to net sales. In essence, gross profit is the difference between cost and the sales price of goods or

services. This ratio answers the question, "Is the markup on cost to selling price sufficient to show a profit in a highly competitive business world?" The operating ratio is the ratio of all operating expenses (including cost of goods sold) to net sales and it indicates the expenses incurred per dollar of sales revenue. "This ratio is commonly used to measure the operating efficiency of the management on the theory that efficient management results in a stable or decreasing operating ratio."

The times-interest earned ratio is the ratio of annual earnings to the amount required annually for interest payments. The larger the ratio, the greater is the financial ability of the issuer to meet its fixed charges payment. The question the bond market analysts seek to answer is: "Can this corporation show a comfortable margin of earnings in ordinary years and avoid default in the worst years?"

The ratios of net income to sales and net income to tangible net worth both are indicators of the profitableness of business operations. The first, measures the profitableness of sales whereas the latter indicates the return on equity investments. Net income in itself is no measure of the success of a business.

The ratio of net income earned per share of common stock is important to the investor since it emphasizes concisely the degree to which income is earned on his investment. Many stockholders have neither the time nor training to properly analyze financial statements, "but if they know little else, they know the importance of earnings." And finally, the net income to dividends ratio gives some indication of the temperament of management and its dividend policy. "The dividends payment test involves an inquiry into the dividend record of the company over a period of years; the amount of earnings available

for dividends, and the proportion of those earnings that has been and may in the future be distributed in dividends."

Conclusion. It is widely believed that the most concise way to express any proof is to express it mathematically. The use of ratios in financial statement analysis is a step in this direction. Ratios permit the analyst to simplify large masses of data and to reduce them to a comparable basis. They depict the trends of the past more readily and more legibly than do the absolute figures. And, they provide the basis for projecting trends into the future, suggesting the way to controls and corrections if the projection is unfavorable.

The development of standards for the various industries and lines of business enables comparative analysis to be meaningful. It is not unnatural for the business man to be inquisitive as to where he stands in relation to others in the industry and to trace his progress or decline from one year or five years past. The creditor and the investor are also interested in standards of performance over a period of years. However, it is more than inquisitiveness that causes these persons to seek out their relative positions; it is a matter of economic well being. This was emphasized by one of America's leading financiers, J. Pierpont Morgan, who said:

While of course unforeseeable disaster may overtake an enterprise ... these are standards and measurements which ordinarily protect the thoughtful man. Impulse is dangerous, listening to intrusted persuasion is dangerous, taking things generally for granted is dangerous Sane people do not put themselves into such dangers.¹

1 Jordan, op. cit., p. 255.

Ratio analysis has its limitations. A ratio can be only as good as the basic data from which it is computed. It is not uncommon to find many figures in financial reports which are somewhat misleading if taken at face value. If proper care is not taken, "comparisons between two companies in the same industry, and to a greater extent two companies in different industries and between entire industries, are so arbitrary as to be not only worthless but dangerous." ² And finally, it should always be remembered that analysis of financial statements is not an exact science.

Ratios are clues or indicators, but not proofs. It is advisable and necessary to pursue analysis beyond the ratio stage to see that the implications suggested are true. The use of ratios in financial analysis and good judgment based on experience, knowledge, and foresight can provide a sound basis for making informed decisions.

² Oswald W. Knauth, "An Executive Looks At Accounting," The Journal of Accountancy, V. 103, No. 1, p. 32, January, 1957.

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