

GUIDE TO

FINANCIAL ANALYSIS

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SECOND EDITION

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GUIDE TO FINANCIAL ANALYSIS

SECOND EDITION

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PREFACE

The fundamental premise of this book is that competent financial management of a business firm requires the use of the most up-to-date analytical tools and the assessment of the normative value of quantitative results in light of prevailing economic and other environmental factors. There are several implications of this premise for a book such as the *Guide to Financial Analysis*. First, the subject matter should focus primarily on practical decision making. Second, the techniques of financial analysis presented should encompass the latest developments in the field, to the extent that these developments can be applied to real-world problems. Finally, qualitative factors that can influence the financial decision should be carefully examined and, if deemed appropriate, allowed to modify or change the recommended action by the firm. The authors have attempted to follow through on these implications.

This second edition is designed as a textbook for any type of course in which solving financial problems or cases is of major concern. Both the text explanations and the illustrations deal with firms of different sizes—large, small, and in-between. The expanded number of problems at the end of the chapters provides the student with an opportunity to apply the analytical techniques in a decision-making framework. In addition, the book can be used effectively with a casebook.

The revision is a major rewrite of the first edition. In addition to the usual updating of subject matter presented previously, the number of topics covered has been substantially increased. Entirely new chapters include 8, 9, and 10, which deal with working capital problems and policies. The use of computer spreadsheets is discussed in Chapter 2 and at other points throughout the text. Solving some of the end-of-chapter problems requires sensitivity analysis. The use of spreadsheets is recommended in finding the solutions, and this fact is so noted at the beginning of the relevant problems.

Chapter appendixes have been added for those who are interested in digging deeper into some of the topics:

Appendix 3A: Analyzing Forecast Accuracy

Appendix 4A: Summing a Geometric Progression

Appendix 6A: Interest Rate Risk

Appendix 6B: Evaluating Option Components of Capital Expenditures

Appendix 11A: Debt Refunding

Chapter 10 in the first edition, "Using Financial Models" has been dropped, and part of the material refined and included with other topics in the revision. All of the other chapters in the first edition have been updated and, in some instances, substantially expanded. For example, systematic risk is now covered in considerable depth in Chapter 6, and the concept is used extensively in later chapters. Appendix 5A, "Federal Taxation of Business Income," has been almost entirely rewritten by professionals in the tax field in order to explain the major aspects of current tax law that are important in financial decision making.

Although the subject matter of the book focuses primarily on solving financial problems, the theoretical base for each major topic is presented in a straight forward manner. Complex theoretical models are avoided, however. The presentation of each analytical technique begins with the basics and then extends to whatever level is necessary to solve practical problems in the most reliable and efficient manner. Although preparation requirements on the part of the reader are minimal, a basic understanding of college algebra and the material normally covered in the first accounting course at the college level will be helpful.

The chapters have not been partitioned into parts within the text. The following chapter grouping and related description provide an overview of the subject matter.

Chapters	Description of contents
1	Introduction: the nature of financial management and decisions
2-3	Financial analysis, forecasting, and planning
4	Valuation: the foundation of financial decision making
5-6	Capital budgeting decisions: evaluation techniques and impact of risk
7	The required rate of return on new investments
8-10	Working capital decisions
11	The financing decision: choosing both the length and the type of financing
12	The dividend decision

The academic field of finance has been highly dynamic during the past 35 years or so—since the publication of the Markowitz paper "Portfolio Selection" in 1952 and the Modigliani-Miller paper "The Cost of Capital, Corporation Finance, and the Theory of Investment" in 1958. Many new financial concepts and approaches to financial decision making have appeared in the literature, and the trend seems to be accelerating. As noted earlier, we have attempted to cover the most up-to-date techniques, so long as they can be applied in solving realistic problems of financial managers. In those areas where new ideas and theories have yet to produce useful application techniques, the potential for the future is noted. Nevertheless, we have attempted to be brief as well as complete.

Various versions of most of the chapters in the book have been used in our classes. Thanks go to those students who have made *constructive* comments. We especially appreciate the individuals who have read one or more of the chapters and have made detailed comments. The latter group includes Dwight Anderson, David

Bowlin, William Dukes, Andrew Fields, Sharon Graham, Thomas Hamilton, Nancy Jay, Ben Nunnaley, Bill Petty, Ernest Swift, John Thatcher, and Allan Twark. Special thanks go to Charles D'Ambrosio, who has been extremely helpful in the writing of both editions. We also express our appreciation to the editors at McGraw-Hill who have provided both encouragement and coordination for the endeavor; these include in particular Suzanne BeDell, Catherine Woods, and at an early point, Scott Stratford. Finally, the patience and understanding of our families during the writing period deserve a very special tribute.

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FINANCIAL MANAGEMENT

Financial management is becoming more complex as well as more crucial to the growth and prosperity of business firms. Fortunately, the increase in complexity and importance of this managerial area has been accompanied by significant improvements in the techniques, or tools, available for making decisions. The objective of this book is to provide a concise explanation of practical techniques of analysis that can be used by financial decision makers. In this first chapter we are concerned primarily with the nature of the financial management function itself and the setting in which financial decisions are made.

FINANCIAL DECISIONS

The financial management of a business enterprise involves (1) analyzing the financial problems with which the firm is faced and deciding which course of action should be taken, and (2) organizing and administering the financial activities of the firm. This book deals with the first of these duties, which we refer to as making *financial decisions*. In this section, the basic types of financial problems encountered in managing a business are reviewed.

The first of these problems concerns how the firm should finance the assets that it needs to conduct its operations. The important elements to consider in making financing decisions include the length of time the assets will be needed, the nature and riskiness of the business operation, the capital structure (debt-equity mix) desired for the firm by management, and the cost of alternative methods of financing.

The second type of financial decision concerns where funds should be invested in the firm. The important factors here include the level of current assets (cash, accounts

receivable, and inventories) necessary for day-to-day operations and the "profitability," or worth to the firm, of opportunities available for fixed asset investments.

Finally, the third type of financial decision is concerned with the owners' withdrawal of profits, or the dividends if the firm is a corporation. The dividend and financing decisions are related, since the payment of dividends reduces the amount of the firm's earnings that are available to finance its investments. However, the payment of dividends often requires special considerations by management, such as the effect of the dividends themselves on the value of the owners' investment. For this reason the question surrounding the payment of dividends is considered the third major type of financial decision.

Making "good" financial decisions requires an ability to identify financial problems and analyze the effect of alternative courses of action on the owners of the firm. This book deals with analytical techniques that can be used in making these decisions.

THE FINANCIAL MANAGER

The financial manager is responsible for identifying financial problems, analyzing the alternative courses of action available to the firm, and, in some cases, making the final decision as to which course of action should be taken. When the problem is considered to be of major importance, however, the financial manager usually will only recommend a course of action to top management. In addition, the financial manager normally has the responsibility for the implementation of management decisions as well as the administration of the firm's day-to-day financial activities. The administrative duties primarily include the supervision of cash flows into and out of the firm. The financial manager is often a part of top management and, as such, is involved in all the firm's major decisions.

The nature of the financial manager's position varies with the nature of the business itself and its administrative organization. In small firms, a single individual often manages all of the affairs of the firm, including its financial activities. On the other hand, the chief financial manager in many corporations is either the treasurer or the comptroller. In large corporations, the chief financial officer is usually a vice president who may also be chairman of a finance committee, the latter group actually being the top financial management of the firm. However, many financial decisions in corporations will be made at lower administrative levels, for example, at the division level.

The only generalization that can be made concerning the nature of the financial manager is that usually the position either is a part of the top management of the firm or reports directly to top management. This fact indicates the importance of the finance function.¹ Regardless of the firm's organizational format, the financial manager has

¹ The importance of the finance function in large corporations is discussed in an article published in *Fortune* magazine in 1976. The article reported that 25.3 percent of the chief executive officers of the nation's largest corporations had a main career emphasis on finance. Further, this career path appears to be growing in importance in recent years. See C. G. Burck, "A Group Profile of the Fortune 500 Chief Executive," *Fortune*, May 1976, pp. 173ff.

the responsibility for analyzing financial problems, making final decisions in some cases, and recommending decisions to top management in other cases.

In this book, the financial manager is considered either an individual or group of individuals (such as a finance committee) responsible for the three basic finance functions described earlier. We will not be concerned further with the position of the financial manager within the organizational hierarchy of the firm. Rather, our attention will focus on the analytical processes that should be used in choosing among alternative courses of action. Thus, we are concerned with how financial decisions should be made, not with who makes them. The analytical processes for making financial decisions should be the same in any case.

THE OBJECTIVE OF FINANCIAL MANAGEMENT

We have discussed the nature of financial decisions and of the financial manager. The question we now address concerns what the financial manager is ultimately trying to do. What is, or should be, the fundamental objective(s) in making financial decisions? In other words, what does successful financial management accomplish?

The reader has probably heard or read statements by the managers of companies indicating all sorts of impressive sounding objectives. These statements typically either imply or declare that the firm should act and is acting in the best interests of the owners, or the stockholders if the firm is a corporation. The meaning of the term *best interests of the owners* in these pronouncements is rather vague, but it is generally used to mean increasing profits or reducing losses. A question arises at this point: Is the owner of a business always better off if all decisions are based on the objective of maximizing the dollar profits (the net income) of the firm? The answer is no. For example, will the owners be better off if the firm spends \$1 million (assuming the money can somehow be obtained) to increase net income by \$1? This type of action would appear to be a terrible waste of resources, because the rate of return on the \$1 million is very low. Thus, maximizing dollar profits breaks down as a specific objective in making this type of financial decision.

Next, consider maximizing the rate of return earned on investment as the objective of the firm. Assume that a new firm is particularly lucky and is earning a rate of return of 40 percent on its total assets. Does this mean that an investment opportunity that promises a return of 35 percent with little risk should be rejected? This could occur if the firm's objective is to maximize the rate of return earned on its assets. The 35 percent return on the new investment, when averaged in with the 40 percent return on the firm's other assets, would lower the firm's overall rate of return on investment. However, common sense tells us that the new investment should be accepted (1) if funds are available to the firm that cost less than 35 percent and (2) if the firm cannot obtain more than a 35 percent return with the same risk by investing in another project.

The preceding discussion indicates that neither maximizing dollar profits nor maximizing the expected rate of return of the firm as a whole is always consistent with the objective of making financial decisions that are in the best interests of the firm's owners. Obviously, the firm would like to increase its dollar profits as well as its

rate of return if everything else is the same. But, as just shown, these objectives cannot be used as the ultimate objective of the firm without considering other factors. Consider next the nature of the decision objective or criterion that should be used by the financial manager.

Requirements for a Decision Criterion

Common sense suggests that a *decision criterion* (an objective for financial decision making) should have the following characteristics:

- 1 It should be based on the anticipated benefits to the present owners of the firm.
- 2 It should be reasonable, clear, and precise.
- 3 It should be applicable to all types of financial decisions, including the financing, investment, and earnings distribution (dividend) decisions.

Financial decisions can benefit the owners of a firm by increasing their wealth. The way to increase the owners' wealth is to increase the market value of their *equity* (i.e., their investment) in the firm. Thus, the decision criterion used in this book is maximizing the market value of the owners' equity. This means that the optimum choice among all possible alternatives is the one that will increase the value of the owners' equity the most. Although the majority of the principles presented can be applied equally well to proprietorships and partnerships, for simplicity of exposition the discussion will usually be directed toward the corporate form of organization. Applying our decision criterion to a corporation means that all decisions should seek to maximize the market value of a share of the common stock of the company.

Application of Maximizing Value to Firms Not Having an Observable Market Price

The objective of maximizing the market value of the owners' equity can be difficult to implement if no observable market value exists. Consider, for example, a firm whose stock has not been traded and therefore does not have an active market or an observable market price. How does a decision maker identify the course(s) of action that will most likely maximize the market value of the owners' equity in this case? The answer lies in the determinants of the value of any earning asset. There are two such determinants: expected return and the risk associated with the return. (We will examine these concepts in Chapters 4, 5, and 6.) Buyers and sellers of an asset base their investment decisions on the expected return and risk from investing in the asset. Thus, the decision maker in a firm whose owners' equity does not have an active market can attempt to make his or her decisions so as to optimize the expected return and risk of the equity. *Optimization*, in this case, means balancing risk and return in an attempt to maximize what the decision maker believes would be the market price of the owners' equity, if it were traded in the market.

Exceptions to the Rule. An example where maximizing equity value does not apply is in a firm that has only one or a limited number of owners who may agree to take high risks in the hope that they will come out better in the long run. These

individuals are more risk-aggressive than the average investor in the market. Thus, the action taken by this type of firm may actually lower the current market value of the firm because of the high risks assumed. In the 1980s this situation became increasingly common through use of the financing mechanism known as the "leveraged buyout" or LBO. LBO firms typically operate with higher levels of debt and, therefore, with lower common equity bases than more widely held companies. The high debt ratios and strained cash flow coverage relationships displayed by most LBO firms tend to depress the current market value of their equity.² However, if the firm is lucky and the course of action taken by the owners proves fruitful, the market value of the equity may be much greater in the long run than it would have been otherwise. It is true that in this situation the principle of maximizing current equity value breaks down. However, note that even in this case, the elements of risk and expected return should be considered by the decision maker. The relationship between the two elements is being optimized from the present owners' point of view, although other investors may not agree. The owners have every right to make decisions in this manner if they are in general agreement. However, they should be aware of the risks involved and willing to assume them.

Finally, maximizing share value does not apply when the firm has a guiding objective other than maximizing the financial benefits to the owners. For example, a firm may have charitable or social objectives that have first priority. Again, objectives of this type are perfectly acceptable, so long as they are legal and all the present owners agree to them. However, even in these cases, analyzing courses of action the firm might take from the point of view of maximizing share value may be useful. The decision maker can then determine the financial benefits the owners have to give up as a result of their company's pursuing other goals. In some cases, this information may indicate that the firm should seek to maximize share value and that the owners should engage in their charitable or social activities in some other manner.

Conclusion

The decision criterion used in this book will be maximizing the market value of the owners' equity. Applied to a corporation, the decision criterion is maximization of the market value of a share of the firm's common stock. As a general rule, this criterion is reasonably precise, and, as we will see in subsequent chapters, it can be applied to financing, investment, and dividend decisions. Empirical evidence indicates that financial management decisions, at least in large corporations, usually seek to maximize the share price of the firm's common stock.³

VALUATION IN AN EFFICIENT MARKET

Maximizing the share price of its common stock is the appropriate objective of financial decisions of a corporation only if the forces of supply and demand are

² See Christopher Farrell, "Learning to Live With Leverage," *Business Week*, November 7, 1988, pp. 138-143.

³ See W. G. Lewellen, "Management and Ownership in the Large Firm," *Journal of Finance*, vol. 24, May 1969, pp. 299-322.

allowed to operate freely in the market so that stock prices are determined in an orderly, consistent, and nondiscriminatory manner. Further, stock prices should reflect all available information that has any relevance to or implication for the return and risk associated with investing in the stocks. This type of stock market is called *efficient*. Most research studies published in recent years indicate that capital (both stock and bond) markets in the United States are reasonably efficient.⁴

Implications of Efficient Capital Markets

If capital markets are efficient, relevant new information will be reflected very quickly in security (stock and bond) prices as it becomes available. Furthermore, new information comes to the market in a random fashion, so that no one will be able to predict either when it occurs or whether the next bit of information will be good or bad news.⁵ There are two important implications of a market that is efficient in this sense. First, an investor will have no logical reason to expect to earn a higher-than-average return on security investments of a given level of risk. This does not mean that the investor *can not* or *will not* earn a higher-than-average return, but only that such an outcome should *not be expected*. The investor may actually earn a higher-than-average return, but also may earn less than the average. Since there is a 50 percent chance of making more than the average and a 50 percent chance of making less, all the investor should expect to make is an average return for the risk class of the security in which the investment has been made.

Second, market efficiency means that the rate of return an investor should expect on a security is a function of the riskless rate of interest (the best example of which is the interest rate on the shortest-term securities issued by the U.S. government) and the amount of risk associated with the security. Although the precise relationship is

⁴ This statement is an interpretation by the present authors of the literature concerned with market efficiency. Strictly speaking, most of the research studies have reported little or no evidence of inefficiency.

For a review of the empirical research dealing with the capital markets' efficiency before 1970, see E. F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, vol. 25, May 1970, pp. 383–417.

A useful and pleasant overview of many theoretical aspects of the market efficiency concept appears in Stephen A. Ross, "The Current Status of the Capital Asset Pricing Model (CAPM)," *Journal of Finance*, vol. 33, June 1978, pp. 885–901. In this 1978 piece, Professor Ross provides an early description of an asset pricing model that has generated much research and debate in the 1980s—"arbitrage pricing theory" (APT). APT is presented in much detail and rigor in Stephen A. Ross, "The Arbitrage Theory of Capital Asset Pricing," *Journal of Economic Theory*, vol. 13, December 1976, pp. 341–360. One of the best, workable descriptions of APT around is Dorothy H. Bower, Richard S. Bower and Dennis E. Logue, "A Primer on Arbitrage Pricing Theory," *The Revolution in Corporate Finance*, edited by Joel M. Stern and Donald H. Chew, Jr., New York: Basil Blackwell, 1986, pp. 69–77.

⁵ This description of the manner in which information hits the market presumes that security trading is a "fair game." From recent history we know this is not always the case. On November 14, 1986, the Securities and Exchange Commission (SEC) announced that well-known investor, speculator, and arbitrageur Ivan F. Boesky admitted to illegal inside trading. Boesky's agreement to cooperate with the federal government cost him \$100 million and a criminal (jail) sentence. Other cases and charges related to the Boesky incident have continued into 1989. On April 26, 1989, a federal judge refused to reduce Boesky's three-year sentence.

Two concise and readable overviews of the insider trading problems are: "Wall Street Enters the Age of the Supergrass," *The Economist*, November 22–28, 1986, pp. 77–78 and "Going After the Crooks," *Time*, December 1, 1986, pp. 48–51.

not always clear, expected return should increase with an increase in risk. Of course, some high-risk securities may actually earn less and some may even prove to be losers, but on the average, the expected return should be higher for an investor who assumes higher risk. The reverse is also true: Expected return should decrease as risk decreases.

An expression of the general nature of the relationship between the riskless rate of interest, risk, and the expected return on a security is given in Figure 1-1. Note that if the security were riskless, the expected return from investing in it would be the riskless rate of interest i . The upward slope of the line in the chart indicates that the expected return will be higher at higher levels of risk.

Expected and Required Returns Compared. In the preceding discussion we have referred to the relationship between the risk associated with a security and the return the investor should expect to receive. Expected return is also related to the return that investors *require* on an investment. Obviously, the expected return must be at least as great as the return required by the investor who purchases the security. Since investors generally require higher return for higher risk, the market price of a high-risk security will have to adjust so that the expected return will be high. Otherwise, no security transactions would ever occur. Note, however, that unforeseen events can cause a wide discrepancy between expected and *realized* returns. Thus, the relationship between risk and expected return appears to be much closer than the relationship between risk and realized returns.

Causes of Efficiency. What causes a market to be efficient in the sense defined? The final answer to this question has not been provided by researchers. In general,

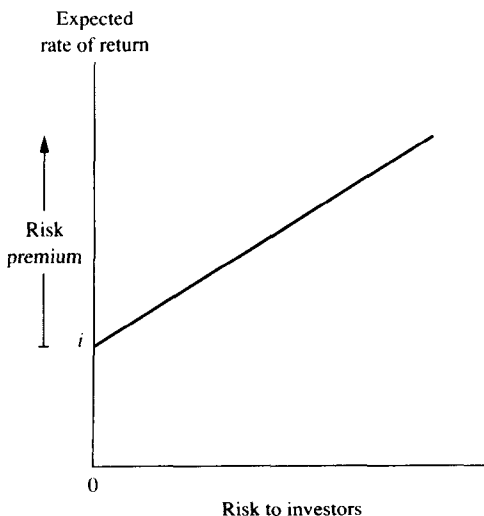


FIGURE 1-1
The relationship between risk and expected return on a security.