Study Guide

for use with

BREALEY | MYERS

PRINCIPLES *of* CORPORATE FINANCE

SIXTH EDITION

Prepared by
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Principles of Corporate Finance

Sixth Edition

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Bangkok Bogotá Caracas Lisbon London Madrid
Mexico City Milan New Delhi Seoul Singapore Sydney Taipei Toronto

McGraw-Hill Higher Education

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Study Guide for use with
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2 3 4 5 6 7 8 9 0 CUS/CUS 0 9 8 7 6 5 4 3 2 1 0

ISBN 0-07-234658-2

http://www.mhhe.com

Preface

This Study Guide to *Principles of Corporate Finance* (the text) by Brealey and Myers is designed to help you learn the principles and practice of finance quickly and as easily. The Guide has been prepared as an aid to students and will enable you get the best of out of the text, your finance course work, and this Guide itself. While each student will find her or his own approach and technique to learn from and use this guide, there are at least three ways in which it can help you.

- **As a read-ahead guide to the text and class-work:** The Study Guide can be used as a read-ahead and preparatory guide before you read and work with each chapter of the text. The Guide takes you quickly through the different sections described in the text and can prepare you for the rigors of the detailed discussions found in the text. Each chapter in the Guide sets the scene for the corresponding chapter in the text and explains the concepts and theories contained in the chapter. The Guide explains how each chapter relates to the other chapters in the text.

- **As a study tool and an aid:** The Guide is designed to work with the text and provides you with a number of practice exercises of different types with detailed answers to the exercises given.

- ***As an aid to post-class review and for exams:*** **The** Guide summarizes the main points of each chapter in a simple and easily understood language. The exercises and the lists of terms will again come in handy when you are preparing for exams.

THE STRUCTURE OF THE GUIDE

Each chapter of the Study Guide refers to the corresponding chapter of the text and includes the following sections:

<u>INTRODUCTION:</u> The introduction at the beginning of each chapter tells you what the chapter is all about. It sets the scene for the chapter by relating it to the other chapters.

<u>KEY CONCEPTS IN THE CHAPTER:</u> This section contains clear and succinct explanations of the concepts and ideas discussed in the corresponding chapter of the text. The term *concept* is used very broadly and includes ideas, theories, models or a particular perspective used by Professors Brealey and Myers. The section parallels the main descriptive part of the corresponding chapter in the text. This section will be very useful in following the theoretical concepts and ideas discussed in the text. You will find it easier to follow the text if you read this part before you read the text. Then, come back and read the section again to fully digest the concepts and theories.

<u>WORKED EXAMPLES:</u> Nearly all the chapters include a number of worked examples (exceptions are Chapters 1, 34 and 35). These examples mirror problems you find in the text and problems you are likely to face in exams (and in corporate finance practice, too). The exercises are complete and explain the rationale or models used. Where appropriate, problems are solved through alternate approaches. Chapter 3 includes a sub-section explaining the use of a business calculator to solve time value of money problems. For those who have not used business calculators before, this part should be of help.

SUMMARY:
The summary is a brief overview of what each chapter covered.

LIST OF TERMS: Each chapter includes a list of new terms, which you encounter in the text. Many of these terms are used in the fill-in-questions. You might want to check this section as soon as you read the chapter to see if you can understand the term and its usage. The text has a glossary of all the terms at the back. A complete alphabetical with reference to the chapter numbers is given at the end of the Guide. The list of terms can be a very useful tool for exams and quizzes.

EXERCISES: The exercises take three forms. A set of fill-in questions includes the new terms you find in each chapter. By completing these questions, you can have a personalized chapter-by-chapter glossary of your own. The second set of exercises consists of problems. These are similar to the types of problems used as worked examples. The third set of exercises is a list of essay questions. The answering these questions require critical thinking, review and analysis of the concepts you learned in each chapter and will be good practice for exams.

ANSWERS: We provide answers to all the exercises other than the essay questions. Complete solutions are given unless a similar problem has been solved earlier in the same chapter. It would be fun to attempt the problems first, before checking the solutions. Again, these are great practice for exams and tests.

Well, I can go on and include tips, suggestions and other great ways to use this guide. But, I am sure that you have seen and heard them all and you can design your own best approach. I am concluding with one simple advice. Finance is useful because it has great practical value. As you study the different chapters of this Guide and the text, try to put yourself in the position of a manager faced with the issue or problem you are contemplating. See if you can help that manager, because soon you would be that manager! Good luck and have FUN.

V. Sivarama Krishnan
July 1999

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1
Finance and the Financial Manager

INTRODUCTION

This chapter, like the customary introductory chapter in most textbooks, gives a brief introduction to the topics covered by the book and provides an overview of the book. The chapter is organized in six sections and covers the following topics succinctly.

- Organizational forms for business and the advantages and disadvantages of the corporate form
- The role and the organizational position of the financial manager
- Separation of ownership and management
- Financial markets and financial institutions
- Overview of the book

KEY CONCEPTS IN THE CHAPTER

Corporate and Other Forms of Business Organization: Common organizational forms for businesses include the *sole proprietorship* – the typical form for a small business owned and managed by a single individual; the *partnerships*, and *corporations*. As the business grows and becomes larger, they tend to be organized as corporations with a large number of stockholders. Most businesses evolve from smaller *privately held* corporations to large *public* corporations. The corporate form enjoys the advantages of limited liability for the owners (stockholders) and the ability to attract large amounts of capital. Professional managers are hired to manage today's typical corporations. This separation of ownership and management gives the firm permanence. Corporations have distinct legal identity and are governed by the *articles of incorporation*. Corporations enjoy considerable flexibility of operation.

The disadvantages of the corporate form include costly legal and accounting set-up and double taxation of earnings.

Financial Manager's Role: Corporations use different *real assets* to run their business and finance the acquisition of these assets partly by raising finances through issue of *financial securities,* which are in the *financial markets* (figure 1.1). The financial manager's primary role is deciding which assets to invest in and how to finance them. Thus the two types of decisions the financial manager is called upon to make are *investing decisions (capital budgeting)* and *financing decisions*. Corporate finance is primarily concerned with these decisions.

Most firms will have other managers in charge of marketing, production, and other functions who work with the financial manager(s) in managing a corporation's operations. Today corporations operate in a global market place with offices and factories located in many countries. Financial markets are also global and companies often raise financing from investors located in many different countries.

Throughout the book, the term financial manager is used in a generic sense meaning anyone who deals with investment and/or financing decisions for a business. Except in very small businesses, the role is typically split into separate positions with the *treasurer* dealing with cash management, raising capital and dealing with investors and financial institutions; and the *controller* entrusted with responsibility for managing the firm's internal accounting, preparation of financial statements, and tax obligations. While small firms typically have a treasurer as the only financial manager, larger firms will have a controller also. As the firm gets larger, the organization of the financial management function becomes more complex and a *chief financial officer (CFO)* oversees the treasurer and the controller with additional responsibility for financial policy and corporate planning. The CFO is part of the top management team for the firm and often is a member of the board of directors. Important financial decisions are often referred to the board of directors and are subject to their approval.

Separation of Ownership and Management: Large corporations have hundreds of thousands of shareholders and it will be impossible to have the "owners" manage the business directly. Thus separation of ownership and management becomes a necessity allowing continuity in management un-affected by changes in ownership. It also paves the way for hiring of professional managers to manage the business. The disadvantage of this separation of ownership and management is that it causes potential *principal-agent problems*. The managers are the agents of the stockholders, who are the principals. The managers may not always act in the best interest of the stockholders. Agency costs are the costs incurred when managers do not act in the interests of the stockholders and their actions need to be monitored. Obviously, owner-managers do not incur any agency costs, as there are no conflicts of interest. Other principal-agent situations in corporate finance include the relationships between the senior managers and the junior managers and that between the lenders and stockholders. The value of a company can be seen as a pie with a number of different claimants such as stockholders, lenders, employees, and even the government. The different claimants are connected by a web of explicit and implicit contracts. To the extent that the interests of the different claimants differ, conflicts and potential agency problems arise. The principal-agent problem would be easier to solve but for the fact that the parties involved have different information about the value of the business. In other words, agency problems are complicated by *information asymmetry*. Financial managers need to recognize the information asymmetry involved before attempting solutions to the agency problems. The problems of agency costs and information asymmetry receive detailed coverage in later chapters.

Financial Markets and Institutions: Corporations issue stocks and bonds to raise funds for their operations. These are known as *primary issues* and the market in which these issues are sold is known as the primary market. The bonds and stocks later trade in *secondary transactions* which do not affect the company's cash position or the balance sheet. The daily transactions in the New York Stock Exchange are examples of secondary transactions. Financial markets include physical exchanges such as the New York or Frankfurt Stock Exchanges or network of dealers operating through the electronic media. Examples of the latter kind include the over-the-counter exchange and the inter-bank foreign exchange market.

Financial institutions such as banks and insurance companies are also important sources of financing for businesses. These institutions are known as financial intermediaries and they enable flow of capital from the people and institutions, which have savings to the businesses and individuals who need financing. Examples of financial intermediaries include banks, savings and loan companies, mutual funds, and insurance companies. The intermediaries repackage the cash flows they receive from their investments into a form that serves the need of their customers such as depositors, insurance policy holders and investors. Financial institutions provide *payment mechanism* for the economy and offer *risk pooling,* loans and deposits, and other services to their customers. They are essential to well-functioning market economies.

Overview of the Textbook: The next 34 chapters of the book cover topics, which can be broadly classified into three groups: investment decisions, financing decisions, and decisions where investment and financing interact in such a way that they cannot be separated. The table below provides a summary listing of the different sections, chapters, and topics covered in the book.

Sections	Part	Chapters	Topics
Introduction	1	1	Finance and financial managers
The investment decision		2-6	How to value assets
	2	7-9	Risk
	3	10-12	Managing the investment process
Financing decision	4	13-15	Corporate financing and market efficiency
	5	16-19	Dividend policy and debt policy
	6	20-22	Options and their applications
	7	23-25	Valuing different kinds of debt
	8	26-27	Risk management
Financial planning	9	28-29	Financial analysis, financial planning, and strategy
Short-term financial management		30-32	Managing short-term assets and liabilities
Mergers and governance	10	33-34	Mergers and corporate governance
Conclusion	11	35	What do we know and do not know about finance

CHAPTER SUMMARY

This chapter provides an introduction to the topic of corporate finance and the role of the financial manager. The chapter discusses the corporate form of ownership. Large corporations are typically organized as public corporations and are usually owned by thousands of stockholders. Corporations enjoy distinct identity, the stockholders have limited liability, and the owners are not associated with managing the company. The separation of ownership and management enables businesses to hire professional managers to run the business and allows the business to operate independent of changes in ownership.

The financial manager plays an important role in the management of the company and is concerned with decisions relating to investment and financing. Depending on the size of the company, the finance function may be organized in different ways. Small companies have a treasurer while larger firms may have a treasurer and a controller. While the treasurer is in charge of cash management and obtaining finances for the business, the controller's job is to see that money is used efficiently and well. Very large corporations have a chief financial officer, who oversees the treasurer and the controller and is part of the senior management team of the company.

Shareholders would want the managers to maximize their wealth by maximizing the value of the company's stock. Managers might be interested in objectives other than stockholders' interests. This conflict is one of the several different types of agency problems affecting the management of large corporations. Other principal-agent problems include the stockholder-bondholder conflict. The agency problems are complicated by the fact that the agents often have better information than the principals do.

LIST OF TERMS

Agency problem
Agent
Bond
Capital budgeting
Chief financial officer
Controller
Corporation
Financial assets
Financial market
Financing
Intangible asset
Investment
Limited liability
Partnership
Principals
Real asset
Share
Securities
Sole proprietorship
Stock
Tangible asset
Treasurer

EXERCISES

Fill-in Questions

1. Most large businesses are organized as _______________.

2. The financial manager is concerned with _________ and ___________ decisions.

3. A __________ is responsible for managing cash and raising finances for the business.

4. The ___________________ oversees the treasurer and the _________ and is part of the senior management team.

5. A company's _____________ include machinery, buildings, and patents.

6. Many accounting firms are organized as _________________.

7. A one-person business is organized as a _________________.

8. Trademarks, patents, and technical expertise are examples of __________assets.

9. Stocks and bonds are examples of _________ assets.

10. Shareholders of a corporation have ____________.

11. Debt securities issued by corporations are called _______.

12. Purchasing new machinery for expanding production capacity is _________.

13. Managers are _______ of shareholders, who are the ________.

14. _____________ is the process of investment decision making.

15. __________are complicated by the information asymmetry between managers and stockholders.

16. A ________ confers part ownership of a corporation.

17. Corporations issue ________ in capital markets to raise money.

Problems

1. Identify the investment and financing decisions from the following list:
   a. Buying new machinery
   b. Issuing bonds
   c. Acquiring a company
   d. Borrowing from the local bank
   e. Receiving credit from a supplier
   f. Buying new computers to replace the old machines affected by the year 2000 problem
   g. Building a new warehouse

2. Separate the real assets from the financial assets:
   a. Shares of IBM
   b. Patents for a new process to manufacture microprocessors
   c. Roads
   d. Brand names
   e. Treasury bonds
   f. An IOU from Bill Gates

Essay Questions

1. Why are most large businesses organized as corporations?

2. "Separation of ownership and management is necessary and desirable." Discuss.

3. "Agency problems will not exist if there was no information asymmetry." Discuss.

4. Describe the differences between each of the following:
   a. A tangible asset and intangible asset
   b. Investment and financing
   c. The treasurer and the controller
   d. A corporation and a partnership

ANSWERS TO EXERCISES

Fill-in Questions

1. Corporations
2. Investment, financing
3. Treasurer
4. Chief financial officer, controller
5. Real assets
6. Partnerships
10. Limited liability
11. Bonds
12. Investment
13. Agents, principals
14. Capital budgeting
15. Agency problems

7. Sole proprietorship
8. Intangible
9. Financial
16. Share
17. Securities

Problems

1. a. Investment
   b. Financing
   c. Investment
   d. Financing
   e. Financing
   f. Investment
   g. Investment

2. a. Financial assets
   b. Real assets
   c. Real assets
   d. Real assets
   e. Financial assets
   f. Financial assets

2

Present Value and the Opportunity Cost of Capital

INTRODUCTION

This chapter introduces the three basic and related concepts that form the very foundation of modern day finance: *present value* (PV), *net present value* (NPV) and *opportunity cost*. Present value gives the value of cash flows generated by an investment and NPV gives the effective net benefit from an investment after subtracting its costs. Opportunity cost represents the rate of return on investments of comparable risk. Application of these concepts enables you to value different kinds of assets, especially those which are not commonly traded in well-functioning markets. The chapter also presents the economic theory behind the concepts.

KEY CONCEPTS IN THE CHAPTER

Present Value: One dollar of cash received next year is worth less than one dollar received today. If you have one dollar today and you can invest it at an interest rate of r, this investment will be worth \$1(1+r) next year. Therefore, how much is \$1 to be received next year worth today? This value is its *present value* and you can see that it will be \$1/(1+r). PV of any cash flow (C_1) received next year, will then be $C_1/(1+r)$ or $C_1 \times [1/(1+r)]^1$. Thus, present value of any future cash flow is its current equivalent. The process of computing PV of future cash flows is called *discounting* and the rate of interest or return used in computing the PV is called the *discount rate*.

Opportunity Cost: What rate should be used to discount a future cash flow generated by an asset? This rate is the *opportunity cost of capital* and determined as the rate of return expected to be received from alternate investments forgone. The rate should reflect the investment's risk. In simple terms, it is the rate of return on investments of comparable risk. One typically looks to the capital market to identify an investment of comparable risk. We deal with explicit models for measurement of risk and estimation of rates of returns in later chapters. The terms discount rate, opportunity cost, and hurdle rate are often used synonymously.

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[1] This process can be extended to future cash flows beyond next year. Chapter 3 deals with the mechanics of computing the PV for cash flows received at different points in time.

Net Present Value: NPV of an asset or investment is the present value of its cash flows less the cost of acquiring the asset. Smart investors will only acquire assets that have positive NPVs and will attempt to maximize the NPV of their investments. Presence of well functioning capital markets enable us to extend this rule to the managers of corporations which have a number of shareholders with different consumption preferences. The *rate of return* received from an investment is the profit divided by the cost of the investment. Positive NPV investments will have rates of return higher than the opportunity cost. This gives an alternate investment decision rule. Good investments are those that have rates of return higher than the opportunity cost. This opportunity cost can be inferred from the capital market and is based on its risk characteristics of the investment.

Separation of Ownership and Management: Section 2-2 explains the theoretical foundation for the NPV rule for investment decisions and the role of capital markets in enabling the individuals to satisfy their individual consumption preferences. As long as the capital market is perfectly competitive (see assumptions listed on page 22), managers of corporations can use the universal rule of choosing only investments that have positive NPVs. This will maximize the stockholders' wealth and this wealth can be traded in the capital market freely. Individual investors can choose their patterns of consumption preferences. Thus, corporate investment decisions can be separated from individual stockholders' preferences for consumption, allowing a clear separation of ownership and management. This is a necessary condition for the operation of large capitalist economies.

Shareholders and the Role of Managers: Shareholders own the corporation and would like to maximize their wealth. Individual shareholders will have different preferences with respect to consumption and saving. However, managers need not worry about individual stockholders' preferences as long as the capital market is competitive. Managers should act to maximize the stockholders' wealth. They can do this by investing only in positive NPV projects. Profit maximization is not a satisfactory goal as the definition or timing of profits can be vague and ambiguous. Profit by itself also does not capture the risk involved in the investment. Assuming that firms operate in competitive markets, a manager maximizing stockholders' wealth also maximizes the society's wealth; the increased wealth comes from value created by the business.

What makes managers act in the interest of stockholders and not in their own narrow self interests? Three major factors cause the managers, by and large, to be efficient and act in the best interests of shareholders. These are: i) managers are monitored by different specialists such as board of directors and investment bankers, ii) poorly performing managers are likely to lose their jobs when the companies run by them get taken over, and iii) compensation packages for managers typically include incentives based on stock performance.

The Capital Market and its Role: The existence of the capital market enables efficient exchange of capital between lenders and borrowers. Lenders save and postpone consumption and borrowers can consume now based on expected future income[2]. Existence of a well-

[2] It is important to note that both lenders and borrowers can be individuals, corporations, and governments

functioning capital market enables us to separate the individual stockholders consumption preferences from the corporate management decisions. The capital market is considered perfectly competitive if the following assumptions are satisfied:

- No individual can influence prices
- Free access to market, cost-free trading, and free availability of information
- No distorting taxes

With perfectly competitive markets, separation of owners' individual interests from the corporation's investment decisions is complete. While the perfect market assumptions may appear to be too good to be true, it is generally accepted that markets satisfy these assumptions to a very high degree of approximation.

Explanation of Formulas and Mathematical Expressions

Notations: C_0 = Investment (or Cost of) in the project = Cash flow at time 0
C_1 = Cash flow at time 1
r = Discount rate or opportunity cost of capital

Formulas: PV = [1/(1+r)] x C_1 = Discount factor x Cash flow
Discount Factor = 1/(1+r)
NPV = C_0 + [1/(1+r)] x C_1
Rate of return = Profit/Investment

Investment Decision Rules:
i) Accept positive NPV investments
ii) Accept investments with rates of return higher than the opportunity cost or hurdle rate

Points to keep in mind:
i) C_0 will usually be negative
ii) Discount factor will be < 1
iii) Discount rate should be a function of the risk of the cash flow
iv) Higher the discount rate, lower the discount factor and lower the PV

WORKED EXAMPLE

Jill Bates, a software engineer has the opportunity to invest in two projects. Details are given in the table below.

(city, state, and national). Also, borrowing as described in this chapter is generic and we will see in later chapters that there are different forms of exchange of capital.