

# Introduction to Finance



by George Blazenko

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## Chapter 1

## *Introduction*

**“What we now call ‘finance’ is, I hold, an intellectual perversion of what began as warm human love.”** *Robert Graves*<sup>1</sup>

**“There are three great social organizations: corporations, universities, and the military. Merit, by-and-large, arbitrates individual success in each.”** *Professor Blazenko*

**“Students say that I am boring the first week of lectures to scare them away from my course. That is not true! I am always boring!”** *Professor Blazenko*

**“Fix it, close it, or sell it!”** *Jack Welch* (former CEO of General Electric Corporation).



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<sup>1</sup> From a speech delivered on December 6, 1963 to the London School of Economics, published as “Mammon” in *Mammon and the Black Goddess*, 1965. Robert Graves (1895-1985) was a British poet and novelist.

## **In Chapter One We Learn:**

- 1. What is finance?**
- 2. What is a business investment?**
- 3. What is a financial investment?**
- 4. What is financial analysis?**
- 5. What are the four questions of financial analysis?**
- 6. What presumptions do we make in financial analysis?**
- 7. What is wealth?**
- 8. How do we measure wealth (value) for the purpose of financial analysis?**
- 9. What are NPV components and how do they fit together?**
- 10. What is a business return?**
- 11. What is an opportunity cost rate of return?**
- 12. How do business returns and opportunity cost rates of return differ?**
- 13. How is finance different from other business subjects, like, accounting and economics?**

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### (1.1) What is Finance?

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#### **Definition of Finance: 13 minutes**

Notwithstanding the first quote on the title page above, finance is an academic and a professional discipline devoted to the study and practice of making “investments.” An investment is anything owned or controlled that has the potential to increase future consumption at the expense of current consumption. This definition highlights the fact that we make investments not simply for monetary gain. There must be something that underlies the gain (or loss), which is the level of your consumption. If you make wise investment decisions, then you, your clients, or financial asset holders of your firm, enjoy greater future consumption.

This definition also highlights the inter-temporal nature of all investments. The benefit of today’s investment is at a future date. The delay can be short for some investments (speculative investment, often) or long for others (business investment, often).

The word “potential” indicates that all investments are risky, which is, of course, an investment attribute that all investors must consider. We *expect* an investment to increase future consumption but it might, unexpectedly, decrease future consumption. Since we can never entirely avoid risk, risk management is a fundamental investor skill that requires our ability to identify and measure.

### 1.1.1 Real Assets Financial Assets and Firms

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#### **Real and Financial Assets: 8 minutes**

We study two principal investments: real assets and financial assets. The word “asset” is synonymous with “investment.” We define the adjectives “real” and “financial” in greater detail later in this chapter. For the moment, you can think of real assets as “Property, Plant, and Equipment” and financial assets as paper assets (like common shares or bonds).

There are two general classes of investors in our economy. Corporations are the primary owners (and operators) of *real assets*, and natural individuals (living and breathing) are the primary owners of *financial assets*. Of course, there are exceptions to these general rules. For example, you might be the owner of an apartment building. In addition, governments own and operate real assets. Nevertheless, ownership of real assets by individuals and governments is small compared to corporations. Corporations and governments are also owners of financial assets, but individuals are the primary owners of financial assets. Financial assets can be held directly by individuals or in trust by pension and investment plans.

A principal theme of this book is that no firm can operate independently of the influence of financial markets. For example, we present evidence in a later chapter that, given some technological characteristics of the industry in which a firm operates, product pricing is influenced by the rate of return required by the financial asset holders (the financial asset-holders of most businesses are just two: creditors and common shareholders). Alternative financial asset investments available in financial markets influence this rate of return. The two sides of a

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corporation – the operating side and financial side – are inextricably intertwined.

Firms raise funds by selling financial assets. They then invest these funds in real operating assets. Because financial asset-holders require rates of return that compensate them for the risk they bear, firms must earn commensurate rates of return from their operating investments. Earnings from real assets allow a firm to make payments to financial asset-holders. Such payments provide a return on invested capital. This relation between firms' operating activity and financial activity determines the flow of investment funds through our economy. In well-functioning financial markets, investment dollars flow to those businesses which earn the highest return on their business investments and can offer investors the most attractive rates of return on their financial investments (relative to risk they bear). The purpose of financial analysis is to measure the operating performance of firms from this perspective.

### 1.1.2 Four Questions of Financial Analysis

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**Four Questions of Financial Analysis: 13 minutes**

A financial analyst must consider four principal questions for any investment. The focus of each question depends on whether the investment was made in the past (retrospective investigation) or whether the investment is under consideration (a prospective investigation). The following exhibit summarizes these questions:

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<b>Retrospective Analysis</b>	<b>Prospective Analysis</b>
<b>Four Questions in Financial Analysis</b>	
(1) What expenditure was made?	(1) What expenditure is required?
(2) What return was <i>realized</i> ?	(2) What rate of return is <i>expected</i> ?
(3) What was the risk of this investment?	(3) What risk is expected of this investment?
(4) Was this a good investment?	(4) Is this a good investment?

**Exhibit 1-1: Fundamental Questions of Financial Analysis**

For many investments, the first question is answered easily. For example, your stockbroker can tell you exactly (more or less) the price you must pay to buy publicly traded common stock. The value of financial assets is often easily determined because financial assets often trade in organized public financial markets, where prices are readily observed. On the other hand, business investment expenditures are generally not so easy to determine. First, real assets do not usually trade in organized markets that allow their values to be observed. Second, development and construction costs for business facilities are often subject to variation and uncertainty. To help us answer this expenditure question, we begin the process by which you can value entire firms with the notion of *invested capital* in the following chapter.

As to the second question, the expected return is obvious for some investments. For example, the expected rate of return on a bond can be determined, at least to a first approximation, from the financial section of your daily newspaper or from many commonly available internet websites. On the other hand, to estimate the expected return on a common share or on a real asset investment, requires projections of future operating performance and the economic environment. Needless to say, such estimates can be difficult to make and are subject to considerable uncertainty.

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We can make one simple general statement for the third question of financial analysis: to evaluate the *risk* of any investment is a difficult proposition. Investment risk is difficult to measure because we operate in uncertain business environments. Nonetheless, it is essential that business analysts learn to characterize, identify, and measure all sorts of business risks. The notion of investment risk is a central theme in any study of finance.

### 1.1.3 Risk

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There are a number of general ways in which you might think about risk. First, you might think of risk as being the variability of potential returns on an investment. For an individual, this investment might be a portfolio of real and financial assets. An interesting question is whether an incremental investment increases or decreases the risk of the overall portfolio. A risky financial asset can be defined as one that increases the overall risk of your portfolio. We will study this question, and *portfolio* measures of risk, in some detail in another chapter of this book.

On the other hand, you might think of risk as being a statistical measure that identifies investments having greater or lesser return variability. For example, you might use the “standard deviation” or the *range* of potential returns as a risk measure.

Finally, you might focus on the characteristics of firms that make their financial assets more risky or less risky. Firms having characteristics that lead to greater return variability for financial asset-holders are more “risky” firms. In a later chapter of this book we examine firm characteristics that lead to greater risk for financial asset-holders.



### 1.1.4 Is This a "Good" Investment?

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“Is this a good investment,” or, equivalently, “was this a good investment,” is the fourth question of financial analysis. Whether an investment is good or not requires having a goal in mind. That goal is at the heart of this first chapter on financial analysis. Further, it is at the heart of your developing world view as a business person. Once we presume and justify a goal for financial analysis in this chapter, in the remainder of this book we add the details of financial analysis.

In this E-book, we answer the “good” question for business investments primarily. However, in chapter twelve, we answer this question for common share portfolio investing but be forewarned that the analysis there (and in chapter eleven) requires more statistical mathematics than we use in the first ten chapters of this e-book. Why more statistical mathematics? We answer that question in the summary to this e-book chapter.

### (1.2) What Is Financial Analysis?

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Financial analysis is the process of asking and answering the four questions required of any investment: expenditure, risk, return, and “is this a “good” investment?” In this book, you will be cast into the role of a budding financial analyst and your role will be to learn how to ask and answer these questions.

Financial analysis is the evaluation of the financial features of a firm. Financial features are those characteristics of a firm that have an influence on its *financial* assets. There are two main uses of financial analysis. The first use is internal to the firm and the second is external. First, firms use financial analysis either to identify areas of improvement for existing operations or to establish values for purchase or sale of operating assets. These uses are related to business activity, and therefore, financial analysis is an invaluable tool in operational and strategic planning. Second,

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investors use financial analysis to evaluate the financial assets for possible portfolio inclusion. In this regard, for example, shareholders consider the dividend and capital gains potential of a firm while creditors seek to establish a firms' ability to repay indebtedness.

Both the internal and external uses of financial analysis are related to investment planning. The internal use guides firms in operations while the external use aids investors in portfolio choice.

Because financial analysis is similar for firms in operations planning and investors in portfolio decisions, we intend this book for both internal and external financial analysts and/or their advisors. These uses of financial analysis are related to one another because the attributes and policies of a firm that discourage investors are the same factors, which, if improved upon, create wealth and value for all of financial asset-holders.

The focus of this book is on widely held public firms rather than closely held private firms although most of the concepts apply equally well. There are two reasons for this focus. First, financial analysis cannot be undertaken by external analysts for private corporations because of a lack of information, (although, financial analysis is nonetheless useful for internal analysts of private corporations). Second, a major distinction between smaller private firms and larger public firms is the importance of risk. Modern public corporations are extremely efficient vehicles for sharing risk among shareholders, and therefore, it is often the case that corporate policy prescriptions based on risk are less relevant for large public corporations. More on this notion in the summary to this E-book chapter.

### **(1.3) Real and Financial Assets**

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Financial analysis can be used by internal analysts for operations and strategic planning or by investors for portfolio selection. The first use is related to real investment and the second is related to financial investment. For corporations, real and financial assets are inextricably related, and

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therefore, this book investigates both: investment by firms in real assets and investment by investors in financial assets. Internal analysts are primarily interested in operations and strategic planning, while external analysts are interested in financial assets. As a foundation for later analysis, we define and discuss the terms *asset*, *real asset*, and *financial asset* in this sub-section.

### 1.3.1 Definition of an Asset

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An asset is anything which is owned or controlled and has potential to increase future consumption. This increase can arise from income generated by the asset or from capital gains that arise when the asset is sold. Some assets – like speculative holding of gold – generate only capital gains, while other assets –like bonds – earn the largest part of their return in the form of periodic income.

There are two general categories of assets, real and financial assets.

### 1.3.2 Business Investments

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**Definition of a Real Asset: 16 minutes**

A real asset has two defining characteristics. First, a real asset is not established by legal contract between *specific* individuals and, second, it must be managed to produce a return. An implication of these characteristics is that, for a real asset, there are no contractually promised payments between specific individuals. A factory is an example of a real asset. The factory is owned by

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because of the rights of private property in our society, it is not created by a legal contract between specific individuals. No profits are promised to the owner, either by contractual guarantee or as a contingent outcome. The first defining characteristic of a real asset is about how it came into being. The factory did not come into being as the result of a contract between individuals. It came into being because someone invented the idea for it, someone engineered it, someone designed it, and someone constructed it. Notice that there might be legal contacts that as associated with a real asset but that did not cause it to come into being. For example, there might be a lease contract that allows an individual to use a factory. However, this contract did not cause the factory to come into being in the first instance. Finally, because the factory must be operated to produce a return, it satisfies our definition of a real asset.

Real assets share some other common characteristics. First, real assets are an important component of the business activities of firms. Second, most real assets are tangible, and last, many real assets are held for the long term (they produce a return over many years). Not all real assets are tangible. A patented idea is an example of an *intangible* real asset. A patent is not created by a contract between specific individuals (although a social contract establishes the existence of patents and the rights of patent holders). The idea that underlies the patent is the real asset. It was not created as a legal contract between individuals. Rather, it was created by someone's intelligence, creativity, innovation, skill, dedication and hard work. Further, there is no return on the patent if it is left idle (i.e., it is not operated). An idea is of no value unless someone uses it. Notice that that this operation need not be by you. For example, you might hold a patent on an idea, but you license the right to use that idea to others for a fee.

Consider a third example, speculative holding of gold. Is gold a real asset or is gold a financial asset? No contract between individuals establishes the existence of gold. Ownership arises from the right of private property and there are no promised future contractual payments. For these reasons, an investor with a speculative holding of gold owns a real asset. However, it is undeniable that this investment has features similar to a financial asset. Other than storage and safeguarding, an investment in gold requires no operation. The speculator buys the gold with the belief that its price will rise in the near future. Gold may be bought or sold any day at minimal cost. Therefore,

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for many investors, speculative purchase of gold is equivalent to a financial investment. Gold has both features of a real asset and features of a financial asset. Thus, speculative holding of gold is an example of assets that are hard to classify. Occasionally it is a matter of interpretation as to whether an asset is real or financial.

### 1.3.3 Financial Assets

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#### **Definition of a Financial Asset: 5 Minutes**

A financial asset is a legal contract between two specific individuals whereby at least one party - and most commonly *only* one party - promises to make future payments to the other party. Naturally, one party promises to make future payments only in exchange for equivalent consideration, such as a lump sum cash payment when the contract is created. The person (possibly a corporate person) who promises to make future payments is called the seller, the issuer, or the writer of the financial asset. The individual who is promised the future payments is called the buyer, the holder, or the owner of the financial asset. The holder of a financial asset is also called the investor. For more speculative financial assets, the issuer of the financial asset is said to have a short position while the holder of the financial asset is said to have a long position. The owner of a financial asset earns a return without managing a business and without creation or transformation of physical goods.

Consider a home mortgage as an example of a financial asset. The borrower promises equal payments during the life of the mortgage in exchange for a lump-sum payment when the mortgage is initiated. Payment every month is contingent upon the borrower's continued ability to pay and

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upon, perhaps, the level of interest rates in the economy. No direct activity is typically required of the lender to receive payment. The mortgage contract specifies the obligations of the borrower and the remedies available to the lender should the borrower default. The borrower is the seller of the financial asset and the lender is the buyer. The sale price is the amount borrowed.



### **A Mortgage as an Example of a Financial Asset: 12 Minutes**

Shares of common stock are another example of a financial asset. The seller of this financial asset is a corporation and the owner is a shareholder. The promised payments from the corporation to shareholders are dividends. These might be regular quarterly dividends, special dividends, or they might even be liquidating dividends. An implication of the observation that the only thing of value received by shareholders from a corporation is dividends, is that the ultimate *source* of value for common shares is dividends (or at least the potential for a firm to pay dividends). The contingency in the payment of dividends is declaration by the board of directors. Based on their business judgment, the board of directors can initiate, increase, decrease, or eliminate, dividends. The *direct* link between shareholders and the firm is declared of dividends, but of course the ability of a firm to pay dividends depends upon its earnings ability. Earnings are, therefore, the *indirect* contingency for dividends.

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**A Common Share as an Example of a Financial Asset: 16 Minutes**

### 1.3.4 Public Versus Private Financial Assets

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Another defining characteristic of financial assets is that after the original issuer sells them, they are transferable by the holder to a third party, at least in principle. If the original financial asset was designed by the issuer to be transferable and if it currently trades among investors, it is called a public financial asset or a security. The term *security* reflects the fact that liquidity arising from tradability makes many public financial assets excellent collateral for other borrowing undertaken by the owner.

The sale of securities by corporations (or other issuers) to general investors is subject to government regulation in the jurisdiction in which the sale is made. The sale of private financial assets is a negotiated agreement between private individuals and is not subject to extensive government regulation.

Common shares and corporate bonds, which trade in organized markets, are examples of public financial assets. In the case of common shares, the incorporation procedure of the firm as a newly created legal entity can be interpreted as the negotiated contract between shareholders and the firm. Incorporation creates both the firm and common shares as financial assets of the firm. The incorporation documents and bylaws are the contract that establishes the existence of a common share. On the other hand, the contract that creates a bond is called the *indenture* agreement. Both the incorporation documents of a firm and the bond indenture agreement are written in terms of generic investors: common shareholders or bondholders respectively. The identity of the actual

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owners of these financial assets is not contractually stated. This lack of identification facilitates transferability of these financial assets amongst investors.

A financial asset that is not designed to be transferable or is currently not trading is referred to as a private financial asset. Private financial assets arise in privately negotiated contracts between issuers and holders. At the time of incorporation, common shares of a firm are transferable but private financial assets. In other words, they have the potential to become public financial assets. At some time in the future, the original owners might sell the shares to general investors. At this time, the shares of stock become public financial assets. Firms that have none of their financial assets traded in public financial markets (accessible by general investors) are called private corporations. In a private company, the right to transfer shares is often restricted in some manner. For example, a sale of shares to “outsiders” might require the approval of the board of directors, or the existing shareholders might have the right of first refusal in the sale. Such restrictions do not commonly exist for a public corporation.

Private financial assets are created by a negotiated contract that identifies both the issuer and owner. This feature precludes transferability (unless this feature is included as a contract term) or direct sale to a third party. Commercial loans are an example of this type of financial asset.

### 1.3.5 Primary and Secondary Market Trades

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When a financial asset is created (or in fact destroyed), the exchange between the issuer and the buyer is called a primary market trade. An example of a primary market trade is the sale of new shares by Bombardier Ltd. to any investor who wants to buy at a specified price. The defining characteristics of a primary market trade are that the original issuer of the financial asset is a direct party to the transaction and that a new set of promised payments is created (or destroyed). Because Bombardier is a party to the transaction, when they sell new shares to new shares holders they raise funds for their business investments and other general corporate purposes. On the other hand,



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when an existing financial asset is traded between investors, the transaction is called a secondary market trade. Notice that the original issuer (Bombardier, for example) is not a direct party to this trade. Stock and bond exchanges – like the New York Stock Exchange, where both stocks and bonds are traded – is an example of a secondary market.

### 1.3.6 Securitization

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The distinction between private and public financial assets is becoming difficult to maintain in current financial markets. The reason for this difficulty is a process known as securitization. Consider the mortgage market as an example. In a home mortgage, the borrower - the mortgagor - has sold a financial asset to the lender - the mortgagee. Beginning in the early 1980s, lenders have formed pools of similar mortgages and have sold rights to receive mortgage payments received in these pools to investors in denominations accessible even to small investors. In exchange for a fee, the original lender simply passes mortgage payments to holders of the new securities. These securities, called mortgage-backed securities, are designed to be tradable among investors. Securitization has the effect of transforming previously private financial assets into publicly tradable financial assets. The original mortgagee has effectively sold a set of private financial assets. Securitization has occurred in such diverse markets as commercial bank loans, automobile loans, loans to less developed countries, and corporate accounts receivable. The fundamental value of the securitization process is that it facilitates the flow of funds to sectors of the economy that are otherwise difficult to finance. For example, even though you might not know it, your ability to borrow to buy your new condo might depend upon the existence of mortgage backed securities and the securitization process. Without this process, alternatively, banks might not be willing to lend to you. In addition, smaller investors have access to a variety of new financial markets and financial assets that were not previously accessible. We all benefit from innovation in financial markets.

## (1.4) Corporations And Information

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Financial analysis differs depending upon whether it is undertaken internally or externally because of access to corporate information. Generally, internal analysts have better access to firm-specific information. Corporate officers – like the chief financial officer – make corporate information available to internal analysts, information that is generally not available to investors. This fact illustrates that the nature of the corporate organizational form can impede financial analysis. Because of this relation, this section outlines the major attributes of the corporate organizational form and the effects these attributes have on financial analysis.

### 1.4.1 The Corporate Organizational Form

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The corporation is the most prominent organizational form of business activity in democratic countries. By any measure of activity, for example sales or asset size, corporations surpass by a wide margin the primary non-government alternatives: sole proprietorships and partnerships. The principal advantage of the corporation - to which all other advantages are related - is its legal identity.

Corporations are legal persons in the eyes of the law; they have the same rights and the same duties as natural persons. Firms can be sued for wrongdoing and damage separately from the financial asset-holders of the firm and other associated groups (for example: shareholders, bondholders, employees, and management). *Limited liability* arises from the legal identity of a corporation. If a corporation defaults on contractual obligations - with exceptions which are few and of arcane legal character - damaged parties must seek remedy with the corporation itself and not with financial asset-holders, including and in particular, common shareholders. This fact implies that

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the maximum loss a shareholder can sustain is his/her original investment in a common share. This feature of common share ownership is attractive to investors and facilitates not only tradability of existing common shares but also the sale of additional shares by corporations for the purpose of financing business activity. Note, however, that limited liability is not an attractive feature of corporations to creditors, and therefore, limited liability might simply favor one type of financing – equity financing – over another – debt financing. There is no inherent reason to believe that limited liability increases overall financing in our economy.

### 1.4.2 Tax for Corporations Versus Natural Persons

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The separate legal identity of corporations permits and facilitates distinct legislative treatment of corporations from natural persons. An example of this distinctive treatment arises in taxation. Corporate and personal taxable incomes are calculated differently and different rates are applied in determining taxes payable. Taxation is an inescapable fact that must be represented in any complete financial analysis for either individuals or corporations. Taxation is the subject of a entire chapter on its own in this book.

### 1.4.3 Separation of Corporate Ownership and Control

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While limited liability and tax advantages contribute to the popularity of the corporate form, its primary advantage is separation of ownership and control. Modern widely held corporations could not have evolved if it were necessary for all corporate business decisions to be agreed upon by all shareholders or even a majority of shareholders. This requirement would not only impede corporate decision-making but would also reveal to competitors elements of strategic advantage.

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Through the authority of legislated Corporations Acts, shareholders of modern corporations have delegated the direction of corporate affairs to boards of directors who are small groups of individuals elected by shareholders and who are charged with the responsibility for managing the business and affairs of the corporation. A director is not required to own shares in a corporation unless articles of incorporation specifically require it. In most cases, however, members of the board are shareholders and often principal shareholders of the firm. In larger firms, the board of directors delegates operational decision making to professional managers (the chief executive officer and other senior managers are commonly board members themselves). Strategic policy initiatives and monitoring of managerial performance remain the major functions of “the Board.” It should be noted that while shareholders elect boards of directors, legislated corporations acts define and courts have interpreted the duties and obligations of directors to be the promotion of the interests of the firm as a whole rather than the interests of common shareholders specifically. An analogous situation exists in representative democracies. While local area constituents vote a representative to a national legislature, this representative is often regarded as a servant of the nation rather than his/her constituents specifically.

### 1.4.4 Access to Corporate Information

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The corporate form of business organization has advantages – primarily that managers can concentrate on business activity rather than moderate and reconcile competing and divergent views of individual shareholders – but it also has disadvantages. The primary disadvantage to shareholders – especially shareholders of widely held corporations – is that they are distanced from operational control/influence over business activity. If shareholders are unsatisfied with firm performance, it is often the case that their only recourse is to sell their shares. This distancing of shareholders from operations also distances shareholders from corporate information. Because shareholders are not party to corporate decisions, generally they are not party to information used to make such decisions. This distancing results from the legal identity of corporations. Because firms are legal individuals, they have the right of privacy –even from shareholders who are

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ostensibly the owners. The primary source of information about decisions made by public firms is its financial statements, which are available to any investor or other interested individual. Financial statement data are summary and aggregate measures of corporate activity, which lack the detail and comprehensiveness of information available to internal analysts. For external analysts, accounting financial data is often the primary source of firm-specific information.

### 1.4.5 Managerial Versus Shareholder Interests

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A second disadvantage of the corporate organization form is that with distancing of shareholders from operations, the possibility arises that managers become entrenched and pursue corporate policies that serve their own interests rather than those of shareholders. In widely held corporations, voting power becomes dispersed and often no one shareholder has sufficient influence to discipline managers. In this environment, it can be argued that managers can pursue their own aims with impunity.

However, in corporations, real assets and their management are inextricably related to financial assets. The same equity market that disperses ownership can also be used by boards of directors to tie the interests of management and shareholders to one another. Managerial compensation plans are commonly designed so a large portion of remuneration is in the form of bonuses, stock options, or equity ownership, which are directly related to performance of the firm vis-à-vis shareholders. When the firm prospers both shareholders and managers prosper. Even if one takes the cynical view that managers of modern corporations pursue their own interests, if managers maximize their own wealth through managerial compensation by increasing financial variables like EPS (earnings per share) ROE (rate of return on equity) or even share price, then, they also maximize the wealth of shareholders because these financial variables represent the interests of shareholders. Equity markets also provide a vehicle for replacement of ineffective management through takeovers, mergers, and acquisitions.

## *Introduction and Overview*

The argument that both financial markets and managerial labor markets align the interests of managers and shareholders is developed in an embedded article by Gary Becker, entitled “Why Managers Have the Shareholder at Heart,” which appeared in a 1985 issue of *Business Week*.

### 1.4.6 Other Corporate Stakeholders

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The interests of managers and shareholders might be aligned, but what about other stakeholders in a firm: what about employees? Social activists often argue that corporate interests are contrary to the interests of workers and employees, and that shareholders and corporations enrich themselves at the expense of their employees. George Vasic wrote an article for the May 1994 issue of *Canadian Business* that argues that the interests of corporations and employees are, in fact, surprisingly congruent. We presume that the primary objective of managers in operating a business is to maximization shareholder wealth. We also presume that this objective is not at the expense of any other stakeholder group in a corporation. There is little to no scientific empirical/observational evidence to the contrary. Of course, there are always individual cases as exceptions but there is no broad general evidence that shareholder wealth maximization is at the expense of any other group in our society. On the contrary, when managers maximization shareholder wealth the general evidence is that all corporate stakeholders benefit.

## (1.5) Wealth Maximization and DCF

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### **Shareholder Wealth Maximization: 29 Minutes**

Legislated Business Corporations Acts describes the duties and obligations of directors as “managing the business and affairs of the corporation.” While this prescription is rather vague, it is often interpreted to mean the maximization of shareholders' wealth.<sup>2</sup> Wealth is the amount receivable upon actual or hypothetical sale of an asset (net of any liabilities that must be paid). Therefore, an interpretation of the objective of managers in operating a business is the maximization of the *current* sale price of a firm upon hypothetical sale (for a private corporation) or maximization of *current* share price for a public corporation.

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<sup>2</sup> Poitras (1994) and Dobson (1999) investigate the relations between shareholder wealth maximization, business ethics, and social responsibility. Dobson evaluates shareholder wealth maximization as a moral justification for business behavior. Poitras reviews empirical studies that test the ethical implications of shareholder wealth maximization.

## *Introduction and Overview*

Why should this objective focus on shareholders? There are many other groups that have an interest in the operation of a business: customers, suppliers, creditors, employees, governments, non-governmental agencies, and society at large. Despite the fact that the author of the above embedded article argues that the interests of shareholders and these groups are congruent, nonetheless, we presume that the primary objective of managers in operating a business is to maximize *shareholders'* wealth. Why shareholders? What is special about shareholders that gives them a little more power compared to the other interest groups in a corporation? The answer is that shareholders have the right to vote for the board of directors. None of these other groups have this right. So, while it might sometimes be difficult, if shareholders don't like how a business is being run, then they can vote in a new board of directors that will change professional managers so that the firm is run in the better interests of shareholders.

This is the answer to our fourth question of financial analysis. An investment is “good” if it increases shareholders' wealth for a private corporation and if it increases share price (other things equal) for a public corporation.

### **1.5.1 Net Present Value as Our Measure of Wealth Creation**

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**Components of NPV: 11 Minutes**

The above goal for financial analysis is still rather vague and we need to make it more concrete. That is, we need a way to interpret and predict whether a business investment that might be made by managers of a firm will increase shareholders' wealth or not. In business practice, we commonly



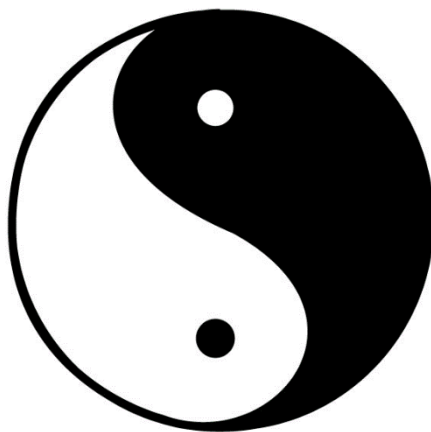
## *Introduction and Overview*

use *net present value* (NPV) or, equivalently, *discounted cash flow* (DCF) analysis as a “theory of value” for this purpose.

In DCF analysis, the value of an investment is calculated as the *net present value* (NPV), which is the present value of predicted future cash-inflows net of the discounted value of required expenditures. There are three fundamental ingredients to any NPV problem:

- (a) predicted amounts of future cash inflows and outflows,
- (b) an accurate representation of the timing of these cash flows,
- (c) an opportunity cost rate of return for the use of capital.

The concept of NPV can be applied to either business investments or financial investments, but, for the moment, let us think of its application to business investments. In this case, we determine the first two elements of a NPV problem from an analysis of a business investment. We determine the third element of a NPV problem from an analysis of financial markets. These two aspects of a NPV problem, the business investment side and the financial investment side, are what we might call the yin and the yang of a corporation:



Sometimes we separate the two sides of the “coin” which is a corporation, the business investment side from the financial side, to focus our financial analysis. Other times, like, for example, in a

## *Introduction and Overview*

NPV problem, it is critical that the two sides be brought back together to answer the question, “is this a good investment?”

The financial side of a NPV problem requires an “opportunity cost rate of return” as a benchmark for business investment analysis in a sense that we will make clear as we proceed through this chapter. However, before we get there, we need to begin by answering the question of whose opportunity cost rate of return we should use. Corporations are legal “fictions” and, therefore, they do not have opportunity costs themselves. On the other hand, we presume that the primary objective of managers in operating a business is to maximize the wealth of *shareholders*. So, it must be the opportunity cost of shareholders that we use in financial analysis. In fact, we can do our financial analysis from the perspective of all financial asset-holders (common share-holders and creditors, for example) or from the perspective of shareholders in particular. We almost always get the same result. For the purpose of discussion here, we will focus on shareholders.

We have already said that the primary investors in financial assets in our economy are persons like you and I. Shareholders are natural persons. So, our perspective for business investment analysis is that a corporation might undertake a business investment or they might return funds to shareholders so that they can alternatively invest in portfolios of financial assets in financial markets. Thus, the opportunity cost rate of return that we use in NPV analysis must be determined from financial markets. The details of this determination we investigate as we proceed through this book.

Business students generally accept the presumption that the primary objective of managers in operating a business is to maximize shareholders’ wealth. So, in “stepping into the shoes” of shareholders and considering their opportunity costs determined in financial markets, all business students must have some familiarity with financial markets and financial principles. Thus, even if you do not plan to study finance in detail, it is important that you as a student of business, regardless of your specialization, take and master at least one finance course.

## *Introduction and Overview*

The *opportunity cost of capital* is the return shareholders can earn on financial assets with approximately the same risk as the business investment under investigation. The opportunity cost of capital goes by a number of different names, such as the discount rate, the market capitalization rate, the cost of equity, and the hurdle rate. For business investments, the opportunity cost rate of return is the *cost of capital* often measured as the *weighted average cost of capital*. We calculate the cost of capital in chapter 2 and the weighted average cost of capital in chapter 9.

### (1.6) An Illustration of Financial Analysis

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Before we begin to develop the details of financial analysis, it is instructive to examine a simple example. The example is not meant to display how much complexity is possible in financial analysis. Rather, this example highlights the fundamental components of financial analysis and how they relate to one another. We will use this example to identify how and where we might ask and answer the four fundamental questions of financial analysis. Should you feel overwhelmed by details of the analysis you see in later chapters and become disoriented, this example may help you to regain perspective.

#### 1.6.1 An Example of Financial Analysis

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**NPV Example: 40 Minutes**

## *Introduction and Overview*

Suppose a firm predicts that it will generate \$400,000 in one year as the result of an investment of \$300,000 today. The \$400,000 represents after tax profit, net of expenses, disposal of the asset, and all other benefits. Notice that we have described two of the three required inputs to a DCF problem, the amount and timing of the predicted future cash flows. The \$300,000 is the answer to the first question of financial analysis for this business investment: the expenditure question.

In addition, suppose that we also have in hand an assessment of the venture's risk that suggests an appropriate opportunity cost is 7% per annum. Because we accept the principle that the primary objective of managers is to maximize shareholders' wealth and because the alternative investment of shareholders is in financial assets in financial markets, we determine this 7% rate of return from an assessment of financial markets. If the corporation does not make the business investment, but instead, gives the funds (that is, the \$300,000) back to shareholders and they invest in financial assets of about the same risk as the business investment, we expect them to earn a rate of return of 7%. So, the 7% is shareholders' opportunity cost rate of return, which is the answer to one of our questions of financial analysis: the return question. It is a special type of return (there are others) but, nonetheless, it is a rate of return.

There are two principal determinants of any expected rate of return from financial markets: interest rates in the economy and risk of the business investment under investigation. In comparing "apples to apples" and "oranges to oranges" with respect to risk, to determine the 7% opportunity cost rate of return, we match a financial asset with the same risk as the business investment that we are contemplating. So, a principal determinant of the 7% opportunity cost rate of return is risk. This is the answer to the third question of financial analysis. The answer to this question is imbed in the opportunity cost rate of return for shareholders. Investors assess and are extremely cognizant of risk in financial markets. Therefore, risk is assessed by financial asset investors and principally in this manner alone. In other words, if investors become more risk averse in our economy, then the 7% opportunity cost rate of return would be greater and vice versa. If the risk of our business investment were greater, then we need to benchmark with a financial asset that has greater risk and that, therefore, has a greater expected rate of return. This greater rate of return means that our opportunity cost rate of return is greater. Get the idea?

## *Introduction and Overview*

Let us now combine the yin and the yang of our rudimentary financial analysis to answer the question “is this a good investment?” The NPV of the business investment is:

$$NPV = \frac{400,000}{1 + 0.07} - 300,000 = \$73,831.77$$

Before we discuss what this number means, let us make a few observations.

First, you never (never, never, never) take the \$400,000 subtract the \$300,000 and say that this is a good investment because its “profit” is \$100,000. Profit is not \$100,000 but alternatively profit is embedded in the \$400,000. Further, the \$400,000 is not directly comparable to the \$300,000 for two reasons. Cash-flows paid or received at two different points of time are not comparable because of the “time value of money,” which means that we as investors never leave money idle but alternatively always invest (in different ways) to earn a rate of interest. Consequently, X dollars received today is worth more than X dollars received in the future. In addition, the \$400,000 is not comparable to the \$300,000 because the \$400,000 is undoubtedly more risky than is the \$300,000. The \$400,000 is our best forecast of the “benefit” of the business investment but there is likely to be much variability in the amount that we will realize after the fact (ex-post) compared to what we expect when we initially make the investment (ex-ante). We have done a risk assessment from financial markets and the 7% opportunity cost rate of return represents the compensation that investors demand for the higher risk of the \$400,000 relative to the \$300,000. So, when we “discount” the \$400,000 by dividing by 1.07, we make these two numbers (the \$400,000 and the \$300,000) comparable on two dimensions: the temporal and the risk dimension. In particular, when we discount, we measure “present” value which means that all dollars are as of today and then, and only then, they are comparable.

You might wonder what the “1” means when we “discount” by 1.07 in our NPV calculation

$NPV = \frac{400,000}{1 + 0.07} - 300,000$ . The answer is that this “1” represents “return of capital.” Because this

is a “one-period” investment, the “1” appears in our discount factor 1.07 when we calculate:

$NPV = \frac{400,000}{1 + 0.07} - 300,000$ . Here, capital is our initial investment of \$300,000. For any \$1 that

we invest, we need to get back at least \$1 in order for this to be a good investment. In addition,

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we need compensation for the time value of money (interest rates in the economy) and the risk of this business investment. These two factors are embedded (in composite) in the opportunity cost rate of return: 7%. We make the business investment today and generate (expected) \$400,000 in one year. We get this \$400,000 just once and not *per annum* indefinitely. If alternatively we were to get a dollar return *per annum* indefinitely then the “1” would disappear in our NPV calculation. In this instance, because we get a dollar return on our business investment every year, capital need never be returned to us.

In our example, NPV is \$73,831.77. What exactly does this number mean? It means that if we undertake this investment, total shareholder wealth increases by \$73,831.77. Their potential for consumption increases by this amount. Thus, the value of this investment is \$73,831.77. This business investment creates wealth for shareholders. Because NPV is positive this is a “good” investment and we as managers who are trying to maximize shareholders’ wealth should make this investment. NPV answers the fourth question of financial analysis: is this a good investment? If NPV is positive, then the answer to this question is yes: this is a good investment.

Wealth creation by firms is inextricably joined to the workings of financial markets. The value of the firm’s assets depends on the opportunity cost of investors. The opportunity cost of investors, in turn, reflects the return expected from alternative *financial* asset investments. These observations mean that no business is independent of financial markets and that every manager must have some understanding of financial markets to ensure that they increase shareholder wealth. Shareholders who believe that a firm will not earn the opportunity cost of capital sell their shares. If many shareholders share a negative opinion, share prices fall until the market price reflects a fair rate of return. Falling share prices reduce the amount of capital available to managers. In this way, markets work to reallocate capital, increasing the resources available to managers who succeed to earn at least the opportunity cost of capital and decreasing the resources available to unsuccessful managers.

## 1.6.2 The Internal Rate of Return

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### **IRR Example: 19 Minutes**

Often financial analysis need not go as far as the NPV calculation. Alternatively, we can recast many investment problems, including the example above, with rates of return. The rate of return on an investment (typically a business investment) is the *internal rate of return* (IRR).

If the internal rate of return is “internal,” what is the “external” rate of return and what do we mean by internal versus external? Good questions. Let’s see if we can answer them.

If the internal rate of return is “internal,” then the opportunity cost rate of return is external. “Internal” is within a company and, even better said, within a particular business investment. “External” is an opportunity cost rate of return from financial markets that are “external” to a particular business investment. Because IRR is “internal,” we calculate it without the external rate of return—the opportunity cost rate of return from financial markets.

The IRR is “the” rate of return on an investment that we calculate as the hypothetical opportunity cost rate of return that makes NPV equal zero. Why? The answer is that if  $NPV > 0$ , the business investment is better (for shareholder wealth creation) than an equivalent financial investment with equal risk. There is only risk and return in finance, so if the business investment and the financial investment have the same risk and the business investment is better, then it must have a higher rate of return than the financial investment. If  $NPV < 0$  the business investment is worse than an equivalent risk financial investment and, thus, must have a lower rate of return. So, only if  $NPV = 0$  is the business investment equivalent to an equal-risk financial investment and, if equivalent, the business investment must have the same return as the financial investment. So, IRR is the return

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for a business investment return because it is equivalent with respect to shareholder wealth creation to an equal-risk financial investment. Wow, I think this is profound!

There is only one market-determined opportunity cost rate of return for any one business investment. That return is the 7% in our above example. However, in alternative market environments interest rates might differ and/or risk might differ and, then, NPV would also differ. Notice, generally when opportunity cost rates of return increase, values as measured by NPV fall. So, values and opportunity cost rates of return relate inversely. This is a common relation in financial analysis and in financial markets.

In our example, the IRR satisfies the following equation:

$$NPV = \frac{400,000}{1 + IRR} - 300,000 = 0$$

With a little algebra, the IRR is (this is not a general formula to be used in all situations but only in the context of our example here):

$$IRR = \frac{400,000}{300,000} - 1 = 33.3\%$$

Notice that to calculate the IRR we did not use the “external” rate of return, the 7% opportunity cost rate of return.

The IRR is the answer to the “return” question for a business investment. This is our third fundamental question of financial analysis. What is the rate of return on this business investment? The general answer is the IRR. Because the rate of business investment return is greater than the opportunity cost rate of return from financial markets (that is, 7%), this is a “good” investment. This is another (generally equivalent) way to answer the fourth question of financial analysis, “is this a good investment.” It is a good investment if it has a rate of return that exceeds the opportunity cost rate of return.



### 1.6.3 Economic Determinants of Business Returns

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You should recognize that the economic determinants of business returns (the IRR) and the opportunity cost rate of return are very different. We know from our discussion above that the principal economic determinants of an opportunity cost rate of return are interest rates in the economy and risk of the business investment under consideration. Investors are averse to risk. If risk is greater than, other things equals, financial asset prices are lesser which means that expected rates of return are greater. These financial asset price changes allow the risk assessment of investors coupled with their risk aversion to continuously determine expected rates of return in financial markets. There are no such price adjustments that influence the rate of return on a business investment. For example, in our numerical example, the \$300,000 expenditure to make our business investment does not change as investors in the economy become more or less risk averse. The \$300,000 is based on technical, mechanical, architectural, engineering and scientific aspects of the business investment.

Note, however, that there is risk inherent in any business investment. We simply mean to say investors in financial markets assess the nature and extent of this risk, which changes prices and expected rates of return in financial markets, which then determine opportunity cost rates of return for financial analysis. In our example, the \$400,000 is uncertain and is, thus, risky. However, no aspect of our business investment depends on investor risk-aversion in financial markets. The 33% expected return for this business investment is subject to risk but changes in investor risk aversion in financial markets have no impact on this amount. Rather, the principal economic determinant of business returns is profitability. More exactly, the principal economic determinant of business return is the relation between expected future profitability and required expenditure to undertake a business investment (that is the relation between \$400,000 and \$300,000 in our example).

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Business persons might not go as far as a precision determination that the opportunity cost is 7%. Often, it is sufficient to use only a rudimentary and "ballpark" understanding of what constitutes a good or a bad return on an investment relative to financial markets. We determined that the IRR on the investment is 33%. It is unlikely that we could earn a return so high consistently over time (at least in the market environment of 2019). With only rudimentary understanding from financial markets of what constitutes a high or a low return, we can do a "rough and ready" assessment of the proposed real asset investment. Business persons often make decisions on the basis of rough and ready assessments rather than detailed evaluations. However, your skill in making rough and ready assessments arises out of good, sound, financial business judgment. The purpose of this book is to "kick-start" your business judgment. In addition, for more marginal investments or for investments critically important to a firm's strategic plans, the value of a more thorough investment assessment is indispensable for business planning. An important aspect of financial analysis is that, in the *process* of evaluating investments, you learn much about the activities you are about to embark upon. Without financial analysis, you miss the learning benefits of planning.

### (1.7) The Accounting Versus the Finance Perspective

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#### **Accounting Versus Finance Perspective: 21 Minutes**

It is instructive to continue the numerical example we began in the preceding section to illustrate the difference in perspective that exists between financial analysis and financial statement presentation. To do this, we must add some detail to our hypothetical firm and its planned real asset investment.

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Suppose that this project is the only asset of the firm and that it is a proprietary idea. In other words, there are no tangible assets that currently accompany the project but the idea could be sold if the firm chose to do so (i.e., it might be an idea protected by patent legislation). The project is not yet financed but when it is financed, equity will be used (i.e., a sale of new shares to new shareholders). We know from the NPV calculation that the financing requirement for the project is \$300,000. The project is a tangible real asset investment. The process of financing and capital spending transforms the idea – an intangible asset – into an idea and a tangible operating asset. There have been no prior transactions of the firm other than incorporation, which we will presume to take place at zero cost.

Take a moment and fill in the missing elements of the following two balance sheets. The first balance sheet is the accounting balance sheet and the second balance sheet is referred to as a “market value balance sheet.” On the left-hand side of the market value balance sheet, record the market value of the asset if the firm were to sell it (the firm itself continues as a legal individual). On the right-hand side record the value of all of the shares in the firm (i.e., the sale price of all of the shares if sold in a block to another investor or set of investors – a secondary market trade of shares).

<b>Balance Sheets Before Financing and Capital Expenditure</b>			
<b>Accounting Balance Sheet</b>		<b>Market Value Balance Sheet</b>	

**Exhibit 1-2: Accounting (Book) Values versus Fair Market Values–Initial**

You should have zeroes on both the asset and the equity sides of the accounting balance sheet. There have been no transactions, and therefore, there is nothing as of yet to account for. The *book value* of the firm’s assets and the *book value* of the firm’s equity are zero. On the other hand, the

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fact there have been no transactions does not imply that the firm does not have value. In fact, by the NPV calculation we know the (estimated) value of the real asset, \$73,831.77. In other words, if the firm wishes to sell the asset (the intangible idea), they should be looking for at least this amount. Like the accounting balance sheet, the right and left sides of the market value balance sheet should be equal, and therefore, the market value of equity in the firm is also \$73,831.77. This amount means that if all shareholders were to sell their shares in a block to another group of shareholders, the total amount they would be looking for is \$73,831.77. Notice that these transactions are somewhat different. In the first case, the firm sells its assets (the firm might go into some other business or develop a new product or idea), in the second case, the firm keeps its assets but the shareholders in the firm are new.

Now, suppose the firm sells shares to new shareholders. The firm needs \$300,000, and therefore, this is the total value of new shares they sell. At the same time, the firm makes capital expenditures in the amount of \$300,000. The intangible idea of the firm is now transformed into an operating business with tangible assets. As in the previous case, the benefits of the investment are receivable in one period. Take a few moments and once more fill in the following accounting and market value balance sheets for the firm.

Values Immediately After Financing and Capital Expenditure			
Accounting Balance Sheet		Market Value Balance Sheet	

**Exhibit 1-3: Accounting (Book) Values versus Fair Market Values—after Investment**

Because the firm has raised \$300,000 in equity and purchased the same amount of fixed assets (and possibly working capital assets), you should have this value on both sides of the accounting balance sheet. On the other hand, the market value of the firm's assets and equity is now the *present* value (rather than the *net* present value, because the expenditure has been made). This value is  $\$400,000 \div 1.07 = \$373,831.77$ . This amount can also be found as the NPV plus the expenditure  $\$73,831.77 + \$300,000 = \$373,831.77$ . This amount is the sum of the value of the idea and the expenditure on assets that put the idea into operation. This is the amount the firm requires if they

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are to sell the idea and the assets and this is also the amount shareholders require if they are to sell all of their shares.

### 1.7.1 The Market to Book Ratio (Price to Book)

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**Market/Book: 11 Minutes**

A number of financial ratios and measures relate value of financial assets to underlying corporate characteristics. These ratios and measures are commonly used in the financial industry because they offer a good deal of insight into how financial markets value and price financial assets. This process is of fundamental interest to investors. From the balance sheets above we can calculate a commonly used financial ratio: the *market to book ratio* (sometimes called the price to book ratio). The market to book ratio can be calculated for either assets or equity. The market to book ratio is a measure of value to expenditure and is, therefore, related to NPV our theory of value. Before financing, the market to book ratio is \$73,831.77 divided by *zero* (infinitely large) for both the firm's assets and the firm's equity. After financing, the market to book ratio is 1.2461 ( $\$373,831.77 \div \$300,000$ ) for the firm's assets and for the firm's equity. The market to book ratios for assets and equity are the same in this example because the firm uses no debt in its financial structure. It is a common characteristic of profitable and high growth-firms that the market to book ratio is greater than one. In the case at hand, we know that the firm is "profitable" because the rate of return on the investment is greater than the opportunity cost. Because of this profitability, the market value exceeds the book value and the market to book ratio exceeds one. This is as it should be; if the market to book ratio for a newly developing firm were lesser than one, it would make no sense to continue with the investment. It would be a negative NPV

## *Introduction and Overview*

investment. After expenditures have been made, circumstances may change and the market to book ratio may fall below one. Firms having financial problems (that is, low profitability) or shrinking product and/or service markets tend to have market to book ratios lesser than one.

### 1.7.2 Opportunity Cost Rates of Return for Business Investment

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In our example above, the opportunity cost rate of return for business investment analysis is 7%. We get this number from financial markets. But, that statement is rather vague. We should give a little more detail.

An opportunity cost rate of return for business investment analysis is called the “cost of capital.” Even for public corporations, the cost of capital is not directly observable because while common shares (of many corporations) trade in an organized market (the stock market) the business assets of most businesses do not trade in a like manner.

But, if we presume a little financial theory (embedded in a present value calculation, PV), then we can sometimes calculate a cost of capital “implicitly.” Calculated in this way it is called the “implied cost of capital.” It is implied by observed ratios from the investment industry, forecasts of business returns, and a presumption about the present value calculation that financial markets use to arrive at observed “value” ratios.

In the context of the numerical example above, the observed “value” ratio is the market to book ratio of 1.2461. “Value” as determined by financial markets is the PV calculation:  $400,000/1.07 = \$373,831.78$ .

Let us generalize a little. Let “I” be the expenditure to undertake the business investment: in our numerical example,  $I = 300,000$ . Let “r” be the cost of capital: in our numerical example,  $r = 0.07$ . Let “C” be the cash-flow from the business investment in one year: in our numerical example,  $C = \$400,000$ .

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Then,

$$PV = \frac{C}{1+r}$$

And, NPV is,

$$NPV = \frac{C}{1+r} - I$$

Recall that the IRR is that *hypothetical* opportunity cost rate of return (r) that makes NPV zero.

So,

$$\frac{C}{1+IRR} - I = 0$$

Solve this equation to find,

$$IRR = \frac{C}{I} - 1$$

The market to book ratio (M/B) is,

$$M/B = \frac{Market}{Book} = \frac{PV}{I} = \frac{C/(1+r)}{I} =$$

(now, we need a little grade 9 algebra)

$$= \frac{C/I}{1+r}$$

(then, from above)

$$M/B = \frac{1+IRR}{1+r}$$

So, at least for this business investment, the market to book is the ratio of one plus business return (IRR) and one plus the opportunity cost rate of return (r).

Now, rearrange,

## *Introduction and Overview*

$$r = \frac{(1+IRR)}{M/B} - 1$$

So, we can calculate the opportunity cost rate of return for business investment with a business return forecast (IRR) and the market to book ratio reported in financial markets (M/B).

This cost of capital formula is useful to highlight how financial markets impound risk into expected rates of return that we, as financial analysts, might use as opportunity cost rates of return for business investment (the cost of capital).

Recall that the principal determinant of business returns (IRR) is corporate profitability. Investors' risk assessment in financial markets does not influence this forecast return. On the other hand, if investors in financial markets were to assess the risk of business investment made by this corporation as greater, the "M" in market/book falls because investors do not like risk. In particular, financial asset prices (like share-price) fall and the M/B ratio falls because expenditure (B) is unaltered. Notice in our cost of capital formula, if M/B falls (with greater risk) and IRR is unchanged, then the cost of capital increases. In this way a corporation's cost of capital embeds investors' risk assessment from financial markets. In a similar way, the cost of capital also embeds investors' expectations for future interest rates.

In our numerical example, our forecast business return is  $IRR = 33.3\%$  and the market/book ratio we collect from financial market reports is 1.2461. Now, calculate the cost of capital for this business as:

$$\text{Cost of Capital} = \frac{(1.3333)}{1.24610} - 1 = 7\%$$

(undoing some rounding).

If risk of this business investment were greater, then the M/B ratio would be lesser, and the cost of capital would be greater than 7%. Investors determine the cost of capital primarily through the M/B ratio.



### (1.8) Summary and Conclusion

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“Is this a good investment” is the fourth and most important question of financial analysis. In this e-book, we answer the “good” question mainly for business investments. However, in Chapter 11 and 12, we answer this question for financial-assets and portfolio-investing by natural persons. Unfortunately, the analysis there requires more statistical mathematics than we use in the first ten chapters of this e-book. The reason that there is a difference in the level of mathematics is that there is also a difference in perspective for business-investing by managers (at least of widely held firms) and portfolio-investing by individuals. We (as financial analysts) by and large, evaluate a business investment on its own merits without considering how it fits into a firm’s overall business-investment portfolio. On the other hand, when we answer the “good” question for financial assets in portfolios in chapters 11 and 12, our focus is how an individual common share adds/detracts to/from risk/return of a common-share portfolio. Why the portfolio perspective for financial assets for natural persons but not for business investments for business managers? Good question!

The answer to this question is contained in our presumption that “the primary objective of managers in operating a business is to maximize shareholder wealth.” A corollary to this presumption that managers should let shareholders do what they do better than managers. As a rule, shareholders are better at diversifying and managing risk in financial markets than managers are at diversifying and managing business-investments risks. If managers take high risk business investments that, nevertheless, create shareholder wealth, then they should do so. Shareholders can diversity this risk in financial-markets by decreasing their portfolio exposure to this particular company. Transaction-costs of shareholders diversifying portfolios in financial markets is minor compared to managers’ transaction-costs from buying, selling, and rearranging business investments to minimize risk. Thus, the objective of managers is not to minimize business risk because shareholders can do this better with diversification in financial markets!

At the same time, the risk reducing benefits of diversification by shareholders in financial markets is critical for answering the question of whether a particular common share is a “good” portfolio

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investment in chapter 11 and 12. Because shareholders need to study risk to a greater extent than business managers, and because portfolio risk requires some rather complex calculations, the level of mathematics is greater in chapter 11 and 12 compared to the first ten chapters of this e-book.

In practice, how does one measure managerial commitment to shareholder wealth-maximization as a corporate objective? How might one rank companies at least publicly traded companies on their commitment to this objective?

Possibly one might use the price/book ratio that we discussed in section 1.7.1, but a primary economic determinant of price/book is growth opportunities, which to a large extent are determined by industry in which a firm operates and less so by business-manager actions. Alternatively, sometimes, financial analysts use business return for shareholders (rate of return on equity, ROE, see chapter 2) for this purpose. Unfortunately, while ROE is a shareholder business-performance measure, it ignores shareholders' expectations for this performance and, further, risk differences underlie expectation differences across companies.

An alternative we propose in chapter 10 is the difference between business return for shareholders (ROE) and shareholders' opportunity cost rate of return (which is called the market capitalization rate, see chapter 8). In the numerical example of section 1.6, this amount is 33% per annum less 7% per annum which is 26%. Business return for shareholders is the return that a business actually earns for its shareholders, whereas, the shareholders' opportunity cost rate of return is shareholder expectation for a business. If a business undertakes only investments for which return exceeds shareholder opportunity costs, then the overall rate of return on all business investments (some more and some less profitable than expected when originally made) will exceed shareholder opportunity cost rates of return. If business return exceeds opportunity cost rate of return, then the business meets shareholder expectations because managers actively manage to ensure that this is so. On the other hand, if this number is close to zero or negative, then the firm in question has (most likely) a plethora of business investments that destroy rather than create shareholder wealth and in not eliminating/disposing/selling these business investments their business objective does not appear to maximize shareholder wealth.

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“Fix it, close it, or sell it,” is a favorite saying of Jack Welch, the former Chief Executive Officer (CEO) of General Electric (GE). He is a true believer the notion of shareholder wealth maximization. However, one can only know when a corporation (or a division) is “fixed,” how much it might be liquidated for, or how much it might be sold for if one undertakes the financial analysis methods we learn in this e-book.

Later in this e-book, once we learn a great deal more about financial analysis, we will be able to rank companies by managerial commitment to the objective of shareholder wealth maximization. In other words, with chapter 1 solely, we have not finished with a primary topic in the study of finance: shareholder wealth maximization.

Even if we cannot directly observe a firm’s cost of capital, sometimes we can calculate it aided by a little financial theory (PV), with observable ratios from financial markets (M/B), and with forecasts of business return (IRR).

In a similar manner, we will calculate implied costs of capital for a number of actual publicly traded corporations in chapter 2. However, there are three big differences in what we do in chapter 2 for real-world corporations compared to our chapter-1 stylized company. Recognizing these additional features of actual corporations will make our analysis in chapter 2 more difficult than chapter 1. But, recall that should you become overwhelmed and disoriented, the chapter-1 example will help you to regain perspective.

First, the business investment in chapter-1 has the peculiarity that it terminates after one year. Typical business investments have no pre-determined termination date or maturity. So, in chapter 2, for actual corporations, we use PV formulae that incorporate the possibility that business investments continue indefinitely (so-called perpetuity present values).

Second, we often expect actual companies to grow by making incremental business investments, which we have not considered in chapter 1. So, in chapter 2, for actual corporations, we use PV formulae that incorporate future growth investment.

Last, in chapter 1, we have made no distinction between assets and equity. The presumption we make is that the corporation finances business investment only with equity. But, actual

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corporations finance business investment with both debt and equity. Recognizing this fact complicates our analysis because we will then have two business returns (one for assets and one for equity) and two opportunity costs rates of return (one for assets and one for equity). While it complicates our analysis, all of these things have their uses in financial analysis.

(1.9) Suggested Readings

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Yufen Fu and George Blazenko. “Normative Portfolio Theory.” *International Review of Financial Analysis* 52(July), 2017, 240-251.

J. Dobson. “Is Shareholder Wealth Maximization Immoral?” *Financial Analysts Journal* 5, 1999, pp. 69-75.

G. Poitras. “Shareholder Wealth Maximization, Business Ethics, and Social Responsibility.” *Journal of Business Ethics* 13 (1994), pp. 125-134.

## (1.10) Problems

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### 1. *Objectives of the Firm.*

What arguments can be made for the view that modern corporations are operated primarily, although not exclusively, for the benefit of shareholders?



Solution

### 2. *Definition of a Financial Asset*

A simple term life insurance contract may be purchased for a single premium (now) in exchange for a lump-sum payment of \$100,000 to the beneficiary if the insured individual dies within five years of the premium payment. Explain how this contract satisfies the definition of a financial asset.



Solution

### 3. *Real Versus Financial Assets*

Is a patent a real or a financial asset? Explain.



Solution

### 4. *Real Versus Financial Assets*

There is a firm that traded on the Montreal Stock Exchange that owns the "rights" to the popular song "Rock Around the Clock." Every time this song is played on radio, the firm receives approximately 2 cents in royalty payments from the player of the song. Does the firm own a real or a financial asset? Explain.



Solution

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### 5. *Primary Versus Secondary Market Trades*

Is a stock split a primary or a secondary market trade? Explain.



**Solution**

### 6. *Primary Versus Secondary Market Trades.*

Legislated corporations acts allow firms to repurchase their own publicly traded financial assets. For example, firms buy back their own common in public equity markets at prices that are agreeable to those investors selling shares. Is a corporate share repurchase a primary or a secondary market trade? Explain and discuss.



**Solution**

### 7. *Internal Versus External Financial Analysts*

Explain differences and similarities between internal and external financial analysts.



**Solution**

### 8. *Primary Versus Secondary Market Trades*

A short-sale of a publicly traded common share takes place when an individual borrows the share, sells it to another investor, and promises to repurchase the share and return it at some indefinite time in the future. The share is often borrowed from a securities dealer, like, for example RBC Dominion Securities. The share is sold through the facilities of the organized stock exchange on which the share is traded. The intent of the short-seller is to buy back the share at a price that is lower than it is sold (of course this does not always happen). Is the short sale a primary or a secondary market trade?



**Solution**

### 9. *Real Versus Financial Assets*

What are two characteristics of a real asset that distinguish it from a financial asset?



**Solution**

## *Introduction and Overview*

### 10. *Definition of a Financial Asset*

Is a lottery ticket a real or a financial asset? Explain and discuss.



**Solution**

### 11. *Real Versus Financial Assets*

Servomation, the company that runs the “Ravens” cafeteria, offers a “coffee card.” Each time you buy a coffee, the card is punched. After you have nine punches, the tenth coffee is free. You now have four punches on your coffee card. Do you own a real or a financial asset? Explain and discuss.



**Solution**

### 12. *Advantages and Disadvantages of the Corporate Organizational Form*

What are the advantages and disadvantages of the corporate organizational form of business activity compared to its principal alternatives: sole proprietorships and partnerships.



**Solution**

### 13. *Interpretation of NPV*

You work for ABC Company. Your boss never graduated from high school. Nonetheless, she has heard about net present value (NPV) and wants you to explain it to her. What does it measure? What are its fundamental components? What factors make net present value difficult to implement in practice?



**Solution**

### 14. *Primary Versus Secondary Market Trades*

Comment briefly on the following assertion. “Because any new shares that are sold by a firm to raise funds for business purposes eventually trade on a stock market (like the Toronto Stock Exchange) this sale is referred to as a secondary market sale.” Use no numerical examples in your response.



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**Solution**

### 15. *Definition of a Financial Asset*

Comment briefly on the following assertion. “In order to make an equity investment in a firm, shareholders expect to receive cash from the firm in the form of dividends and capital gains.” Use no numerical examples in your response.



**Solution**

### 16. *Net Present Value and the Market to Book Ratio*

ABC Company is planning a real asset investment. ABC is a start-up firm, and therefore, it has no previous investments. Also, ABC has no other investments planned or contemplated other than the one described in this problem. For an investment of \$I today, the expected benefit to ABC in one year is \$140,000. This benefit is the profit on the investment, plus salvage, net of taxes and commissions, etc. The internal rate of return on the project is 40%. Currently, ABC has no debt in its financial structure and its book equity is zero. Book equity is the sum of share-capital and retained earnings. In order to undertake its investment, ABC needs to do some financing. They plan to sell ABC sells new shares to new shareholders in the amount of \$I to finance their real asset investment. Immediately after the share issue and the required capital expenditure of \$I, ABC’s market to book ratio for equity is 1.20 (there remains, nonetheless, one year before the expected cash flow benefit of \$140,000 is received).

Required: What is the financial market opportunity cost (expressed as a rate of return) facing the shareholders of ABC? (In other words, what is the discount rate?)



**Solution**

### 17. *Opportunity Cost*

Comment on the following assertion: “With respect to corporate financial analysis, the *opportunity cost* rate of return is the rate of return that a firm earns from its investment into business activity on behalf of all its financial asset-holders. This return is called the opportunity cost because the investment allows investors the “opportunity” to profitably investment in the

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dynamic business environment of this particular firm.” Use no numerical examples in your response.



**Solution**

### 18. **Definition of a Real Asset**

Comment on the following assertion: “An apartment building is a financial asset rather than a real asset because its stable rental income makes the rate of return on this investment of only modest risk.” Use no numerical examples in your response.



**Solution**

### 19. **The Fundamental Questions of Financial Analysis.**

For the purpose of undertaking financial analysis, there are at least three fundamental questions associated with any investment. What are these questions. You are the financial analyst at ABC company who is charged with evaluating the recent performance of ABC for shareholders. With respect to the investment made by ABC’s shareholders, discuss the ratios and/or measures which you might calculate to answer or investigate each of these questions for the shareholders of ABC.



**Solution**

### 20. **Definition of a Real Asset.**

Joe Canoe is a rancher. His herd of cattle (or any other herd of cattle) is not allowed a depreciation deduction for tax purposes. In the eyes of the government, this asset is not “depreciable.” Comment on the following assertion: “If this asset is not depreciable, it cannot be a real asset, and therefore, it must be a financial asset.”



**Solution**

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### 21. Market to Book Ratio

Comment on the following assertion: “Because firms create wealth for their financial asset-holders and their shareholders in particular, the Market to Book ratio for a firm’s common equity must always be greater than one.”



**Solution**

### 22. Opportunity Cost

ABC Company is planning a real asset investment. ABC is a start-up firm, and therefore, it has no previous investments. Also, ABC has no other investments planned or contemplated other than the one described in this problem. For an investment of \$I today, the expected cash-flow benefit to ABC in one year is \$40,000. Thereafter, this per annum benefit is expected to grow at 5% per annum indefinitely into the future. That is, for example, the cash-flow benefit two years from today is  $\$40,000 \times 1.05$ . Ignore, taxation, salvage, depreciation and commissions in this problem. The internal rate of return on this investment is 45%. Currently, ABC has no debt in its financial structure and its book equity is zero. Book equity is the sum of share-capital and retained earnings. In order to undertake its investment, ABC needs to do some financing. They plan to sell shares to new shareholders in the amount of \$I to finance their real asset investment. Immediately after the share issue and the required capital expenditure of \$I, ABC’s market to book ratio for equity is 4 (there remains, nonetheless, one year before the first expected cash flow benefit of \$40,000 is received). (Hint: the formula for Present Value of an amount \$C in one period that grows per period at g100% per period indefinitely and the opportunity cost rate of return is r100% per period is  $C/(r-g)$ ).

**Required:** What is the financial market opportunity cost (expressed as a per annum rate of return) facing the shareholders of ABC? (In other words, what is the discount rate?)



**Solution**

### 23. NPV and the Market to Book Ratio.

ABC Company Ltd., is considering a possible business investment that requires a \$300,000 expenditure today. Immediately after the expenditure, the new venture’s market to book ratio (value to expenditure) is 2.2.

**Required:** What is the new venture’s Net Present Value (NPV)?



**Solution**

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### 24. **Market/Book and IRR**

Today, ABC Company is planning a business investment. ABC is a start-up firm, and therefore, it has no previous investments. Also, ABC has no other investments planned or contemplated other than the one described in this problem. For an investment (expenditure) of \$I today, the expected cash flow to ABC is \$C per annum indefinitely beginning one year from today. This cash flow is profit on the investment, net of taxes and commissions, etc. Currently, ABC has no debt in its financial structure and its book equity is zero. Book equity is the sum of share-capital and retained earnings. In order to undertake its investment, ABC needs to do some financing. They plan to sell new shares to new shareholders in the amount of \$I to finance their business investment. ABC's market to book ratio for equity immediately after the share issue is 2.5. The Internal Rate of Return (IRR) on the business investment is 25%.

**Required:** Find the financial market opportunity cost (expressed as a rate of return) facing the shareholders of ABC for this investment.



**Solution**

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