

# INVESTMENTS

EIGHTH CANADIAN EDITION



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MARCUS  
PERRAKIS  
RYAN

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## Investments

### Eighth Canadian edition

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The first Canadian edition of this text was written more than two decades ago. The intervening years have been a period of rapid and profound change in the investments industry, and included as well a financial crisis of historic magnitude that hit the U.S. financial markets. The vast expansion in financial markets during the intervening period was due in part to an abundance of newly designed securities, in part to the creation of new trading strategies that would have been impossible without concurrent advances in computer technology, and in part to rapid advances in the theory of investments that have come out of the academic community.

Yet the financial crisis was also rooted in these developments. Many of the innovations in securities design facilitated high leverage and increased reliance on risk transfer strategies of dubious efficiency. These, coupled with relaxation of regulatory controls and reduced transparency, masked the increased exposure to risk of key financial institutions. Although these regulatory failures were not present in Canada, and for this reason the financial crisis was not felt as acutely in the Canadian markets, the new edition of our text reflects these world events.

This Eighth Canadian Edition of *Investments* is intended primarily as a textbook for courses in investment analysis. Our guiding principle has been to present the material in a framework that is organized by a central core of consistent fundamental principles. We make every attempt to strip away unnecessary mathematical and technical detail, and we have concentrated on providing the intuition that may guide students and practitioners as they confront new ideas and challenges in their professional lives.

This text will introduce you to major issues currently of concern to all investors. It can give you the skills to conduct a sophisticated assessment of current issues and debates covered by both the popular media and more specialized finance journals. Whether you plan to become an investment professional or simply a sophisticated individual investor, you will find these skills essential.

Our primary goal is to present material of practical value, but all five of us are active researchers in the science of financial economics and find virtually all of the material in this book to be of great intellectual interest. Fortunately, we think, there is no contradiction in the field of investments between the pursuit of truth and the pursuit of money. Quite the opposite. The capital asset pricing model, the arbitrage pricing model, the efficient market hypothesis, the option-pricing model, and the other centrepieces of modern financial research are as much intellectually satisfying as subjects of scientific inquiry as they are of immense practical importance for the sophisticated investor.

In our effort to link theory to practice, we have also attempted to make our approach consistent with that of the CFA Institute. In addition to fostering research in finance, the CFA and the ICFA administer an education and certification program to candidates seeking the title of chartered financial analyst (CFA). The CFA curriculum represents the consensus of a committee of distinguished scholars and practitioners regarding the core of knowledge required by the investment professional.

Many features of this text are designed to be consistent with and relevant to the CFA curriculum, with end-of-chapter questions from past CFA exams. Chapter 3 includes excerpts from the “Code of Ethics and Standards of Professional Conduct” of the CFA Institute; Chapter 24 presents the CFA Institute’s framework for systematically relating investor preferences and constraints to ultimate investment policy.

In this Eighth Edition, we have extended our systematic collection of Excel spreadsheets that give students tools to explore concepts more deeply than previously possible. The spreadsheets are available on Connect, and provide a taste of the sophisticated analytic tools available to professional investors.





## UNDERLYING PHILOSOPHY

Of necessity, our text has evolved along with the financial markets. In this edition, we address many of the changes in the investment environment.

At the same time, a few basic *principles* remain important. We believe that attention to these can simplify the study of otherwise difficult material, and that they should organize and motivate all study. These principles are crucial to understanding the securities already traded in financial markets and in understanding new securities that will be introduced in the future. For this reason, we have made this book thematic, meaning we never offer rules of thumb without reference to the central tenets of the modern approach to finance.

The theme unifying this book is that *security markets are nearly efficient*, meaning most securities are usually priced appropriately given their risk and return attributes. Free lunches are rarely found in markets as competitive as the financial markets. This simple observation is remarkably powerful in its implications for the design of investment strategies; as a result, our discussions of strategy are always guided by the implications of the efficient market hypothesis. While the degree of market efficiency is, and always will be, a matter of debate (in fact, we devote an entire chapter to the behavioural challenge to the efficient market hypothesis), we hope our discussions throughout the book convey a good dose of healthy criticism concerning much conventional wisdom.

### Distinctive Features

*Investments* is designed to emphasize several important aspects of making investment decisions:

1. The central principle is the existence of near-informational-efficiency of well-developed security markets such as ours, and the general awareness that competitive markets do not offer arbitrage opportunities or free lunches to participants.
2. A second theme is the risk–return tradeoff. This too is a no-free-lunch notion, holding that in competitive security markets, higher expected returns come only at a price: the need to bear greater investment risk. However, this notion leaves several questions unanswered. How should one measure the risk of an asset? What should be the quantitative tradeoff between risk (properly measured) and expected return? The approach we present to these issues is known as *modern portfolio theory (MPT)*. This approach focuses on the techniques and implications of *efficient diversification*, and we devote considerable attention to the effect of diversification on portfolio risk and the implications of efficient diversification for the proper measurement of risk and the risk–return relationship.
3. This text puts greater emphasis on asset allocation than most of its competitors. We prefer this emphasis for two important reasons. First, it corresponds to the procedure most people actually follow. Typically, you start with all of your money in a bank account, only then considering how much to invest in something riskier that might offer a higher expected return. The logical step at this point is to consider other risky asset classes, such as stocks, bonds, or real estate. This is an asset allocation decision. Second, most of the time, in determining overall investment performance, the asset allocation choice is far more important than the set of security selection decisions. Asset allocation is the primary determinant of the risk–return profile of the investment portfolio, and so it deserves primary attention in a study of investment policy.
4. This text has a broader and deeper treatment of derivative securities than most investments texts. Markets for derivatives, including options, futures, and more complex instruments, have become both crucial and integral to the financial universe. Your only choice is to become conversant in these markets—whether you are to be a finance professional or simply a sophisticated individual investor.



## NEW IN THE EIGHTH CANADIAN EDITION

The following is a guide to significant changes in the eighth Canadian edition. This is not an exhaustive outline but an overview of the important additions and changes in coverage from the previous edition. Aside from the frequent amplification and deletion of various topics, specific changes of note include:

**Chapter 3** provides an update of the evolution of trading platforms and changing ownership structures of the Canadian securities markets.

**Chapter 4** has been updated with considerable attention to evidence on tail risk and extreme stock returns.

**Chapter 7** now includes a streamlined presentation of the traditional CAPM and a more thorough discussion of its assumptions, extensions, and tests.

**Chapter 8** has expanded the discussion of the differences between the index model and the full Markowitz model.

**Chapter 9** on market efficiency provides additional coverage of the debate between active and passive management and the small-cap anomaly.

**Chapter 10** gives an amplified description of the use of price charts to describe, and perhaps predict, the trends in the price movement, by illustrating the use of moving averages and Bollinger bands in the charts.

**Chapter 11** has expanded the coverage of tests of multifactor models of risk and return and the implications of these tests for extra-market hedging demands.

**Chapter 12** includes new material on credit default swaps.

**Chapter 15** responds to requests for more macroeconomic analysis; this is a completely new chapter on the subject, split off from the former Chapter 15 and greatly expanded. The new Chapter 16 consists largely of the remainder of the old chapter, with the expected updating of material and minor rephrasing. All the following chapters have been renumbered accordingly.

**Chapter 16** has new material on ratios and fair value accounting in addition to use of up-to-date financial statements.

**Chapter 19** (formerly 18) includes additional material on risk-neutral valuation methods and their implementation in the binomial model, and the implications of the option pricing model for tail risk and financial instability.

**Chapter 23** has a greatly revised discussion of the issues surrounding international diversification in its discussion of the risk, return, benefits, and potential from diversifying portfolios to include international assets.

In addition, a great many new problems have been introduced to many chapters.



## ORGANIZATION AND CONTENT

This Canadian edition is both an adaptation of the U.S. text for a Canadian audience and an extension of the material to incorporate several topics of specific Canadian interest. The adaptation has changed the presentation and examples of the basic material with respect to currency, the macroeconomic environment, tax rates and legislation, and other legal and institutional features of the Canadian economy. Substantial information about the U.S. institutions is included, as much of the investment activity by Canadian investors takes place in U.S. markets, implying that Canadian investment professionals cannot afford to ignore the situation south of their country's

border. Not only does the U.S. market set the standards for most of the financial innovation and research in Canada, but it also paces many of the economic developments that underlie the performance of the Canadian financial system. Nevertheless, several Canadian financial aspects are unique and deserve more extended coverage in their theoretical and empirical aspects.

### **Part 1: Introduction**

The first three chapters are introductory and contain important institutional material focusing on the financial environment. We discuss the major players in the financial markets, provide an overview of the types of securities traded in those markets, and explain how and where securities are traded.

The material presented in Part 1 should make it possible for instructors to assign term projects early in the course. These projects might require students to analyze in detail a particular group of securities. Many instructors like to involve their students in some sort of investment game, and the material in these chapters will facilitate this process.

### **Parts 2 & 3: Portfolio Theory & Equilibrium in Capital Markets**

Parts 2 and 3 contain the core of modern portfolio theory. Chapter 4 reviews the historical returns to various classes of Canadian instruments and presents statistical techniques used in their analysis. It also compares the performance of the basic Canadian market portfolio with that of several U.S. portfolios. Chapter 5 discusses risk and risk aversion and then presents the capital allocation decision. Chapter 6 goes on from capital allocation to portfolio selection and the development of the capital market line. The next two chapters treat the development of the CAPM and its extensions and alternatives, such as the arbitrage pricing theory. Chapter 9 discusses the reasoning behind the idea that random price movements indicate a well-functioning or efficient market. Chapter 10 discusses behavioural finance and technical analysis. Chapter 11 reviews empirical evidence on security returns, including tests of the CAPM and other studies in the context of market efficiency.

### **Part 4: Fixed-Income Securities**

Part 4 is the first of three parts on security valuation. This Part treats fixed-income securities—bond pricing (Chapter 12), term structure relationships (Chapter 13), and interest-rate risk management (Chapter 14). The next two Parts deal with equity securities and derivative securities. For a course emphasizing security analysis and excluding portfolio theory, one may proceed directly from Part 1 to Part 4 with no loss in continuity.

### **Part 5: Equities**

The three chapters of this Part are devoted to the popular forms of security analysis—economywide and firm-specific fundamental and statement analysis. Macroeconomic analysis concerns national and industry economic concept. Fundamental analysis treats refinements of the dividend discount model, while statement analysis presents the traditional accounting approach to assessing value.

### **Part 6: Derivative Assets**

Chapters 18 and 19 describe options, beginning with a description of the instruments, their payoffs, and the markets in which they trade, and then continuing to the details of models for valuation. Chapter 20 presents similar material for futures, forward contracts, and swaps. Together these chapters describe how risk management can be achieved.

### **Part 7: Active Portfolio Management**

This Part presents active management as an alternative to passive acceptance of efficient markets. It describes how to measure the performance of individuals and institutions who attempt to time markets or select portfolios, and how they can practise the techniques such as selective indexing, or inclusion of active portfolio components. We also discuss in depth mutual funds and other investment companies, which have become increasingly important means of investing for individual investors. Finally, this Part addresses international investing as an added component of portfolios.



## ACKNOWLEDGMENTS

We, the Canadian authors, would first like to express our gratitude to Professors Bodie, Kane, and Marcus for their continued improvement to what has been an outstanding text. Also, we appreciate their agreement to join in our production of a Canadian edition.

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Many of the tables and graphs have been compiled from information provided through the cooperation of Statistics Canada. Readers wishing to obtain further information may contact Statistics Canada's Regional Offices, its Web site at [www.statcan.gc.ca](http://www.statcan.gc.ca), and its toll-free access number 1-800-263-1136. Much credit is due also to the development and production team at McGraw-Hill Ryerson: our special thanks go to Kim Veevers, Senior Product Manager; Kamilah Reid-Burrell, Product Developer; Joanne Limebeer, Supervising Editor; Rodney Rawlings, Copy Editor and Proofreader; Indu Arora, Permissions Editor; and the rest of the development team.

**Stylios Perrakis**

**Peter J. Ryan**

**Lorne Switzer**



# WALKTHROUGH



## PEDAGOGY

This book contains features designed to make it easy for the student to understand, absorb, and apply the concepts and techniques presented.

### **Current Event Boxes**

Short articles from business periodicals are included in boxes throughout the text. The articles are chosen for relevance, clarity of presentation, and consistency.

### **Excel Spreadsheets**

The Eighth Edition includes boxes featuring Excel® spreadsheet applications. A sample spreadsheet is presented in the text with an interactive version and related questions available on the Connect® site.

### **Concept Checks**

A unique feature of this book is the inclusion of Concept Checks in the body of the text. These self-test questions and problems enable the student to determine whether they have understood the preceding material.

### **Summary and End-of-Chapter Problems**

At the end of each chapter, a detailed Summary outlines the most important concepts presented. The Problems that follow the Summary (after the Key Terms and Selected Readings sections) progress from simple to challenging. Many of them are taken from CFA exams and represent the kinds of questions professionals in the field deem relevant; these are indicated by an icon next to the problem number.

### **Internet Exercises: E-Investments**

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# INVESTMENTS

EIGHTH CANADIAN EDITION



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PART

1

**INCLUDES :**

**CHAPTER 1**

The Investment Environment

**CHAPTER 2**

Financial Markets and  
Instruments

**CHAPTER 3**

Trading on Securities  
Markets



**LEARNING OUTCOMES**

- 1.1 A SHORT HISTORY OF INVESTING
- 1.2 THE ECONOMIC SYSTEM AND INVESTMENT
- 1.3 THE PARTICIPANTS: INDIVIDUALS AND FINANCIAL INTERMEDIARIES
- 1.4 RECENT TRENDS
- 1.5 THE AGENCY PROBLEM: EXECUTIVES, ANALYSTS, AND AUDITORS
- 1.6 LESSONS TO LEARN
- 1.7 OUTLINE OF THE TEXT

# The Investment Environment

The world of investing looks much like a jungle to the uninitiated—a dangerous and exotic place, and definitely unfamiliar territory. Competent and intelligent professionals from other fields such as medicine and law react to this prospect in a perfectly rational way; just as they are hired for their expertise, they expect to need a professional financial advisor to guide them around the pitfalls. With a thorough understanding of the concepts in this book, they would find themselves quite capable of an enlightened discussion with such an advisor. By contrast, a representative of the accounting or financial profession would be far less comfortable discussing a legal case or operating procedure with the benefit of a single text on law or medicine.

This chapter introduces the environment of investing. Capital investment, with its need for funds, gives rise to capital markets. Fortunately, individuals have excess funds and regularly provide them to institutions that require those funds. The process is complex and highly organized. Capital markets exist for a diverse array of financial instruments that meet the precise needs of investors and users of capital; each of those instruments, starting with stocks and bonds, has evolved in response to those needs. We examine this system from all angles, the individuals and the institutions and their respective requirements, and the financial intermediaries which serve to bring the two together.

We begin with a short presentation of the turbulent history of North American markets. This is followed by an examination of the markets and their participants—the process of capital formation, the roles that the market plays, and individual investors and their investment-consumption patterns. After this, we describe the system of financial intermediaries and how these have created instruments responsive to the needs of the participants. Finally, we discuss how the market turbulence represents a failure of the financial system to fulfill its purpose—determining the value of financial assets through the sale and purchase of financial instruments.

## 1.1

**A SHORT HISTORY OF INVESTING**

Investing has been a priority for as long as individuals realized that current needs had to be balanced with future needs. Once society had progressed from a truly hand-to-mouth existence, food and other assets have been stored for later consumption. The creation of coinage as a means of exchange enabled individuals with surplus assets to store their wealth in a currency and transform it into an investment in assets of other varieties. Over the millennia, the economic system has developed to direct the surplus wealth of some individuals into needed areas of production.

By the twenty-first century, this evolution has culminated in a vast array of financial contracts made between individuals and institutions, each specifying how an initial investment will yield payment flows over a period of time. That period ranges from a day to eternity, even if neither party to the contract is likely to last very long. All of these contracts have evolved from more primitive forms that might have existed for centuries or more. The refinement of the contracts reflects the attempt to satisfy the specific needs of the one party requiring funds for a purpose and a time, and with a vision of when returns from the investment of those funds are likely to occur. On the other side, the investing party has needs for a specific pattern of payments for future consumption or for reinvestment in other contracts.

The fascination of the public with the investment world varies in intensity, with a general lack of interest in this poorly understood and not very newsworthy subject—except occasionally when stock market activity and results capture media attention. This was the case during the 1920s, as fortunes were rapidly made by supposedly brilliant investors; in those days, “elevator boys” and cab drivers overhearing the Wall Street financiers in their discussions participated in the public mania for investing. The result was a phenomenal rise in the stock market averages and the Crash of 1929, which appeared to precipitate the Great Depression.<sup>1</sup>

Near the end of the century, the crash of 1987 attracted universal interest by the one-day panic in the stock market. Unlike in 1929, however, no economic collapse followed. This may well have been due to more enlightened financial response by monetary officials; but the economic situation was markedly different. So was the financial environment, as 1987 turned out to be a neutral year for investors from January to December. Once out of the way, with confidence restored, the 1987 crash set the stage for the economic and financial boom of the 1990s.

The 1990s were also a period of public interest in the stock market, with nightly news reports on the levels of the market indices—the Dow and the TSX—on both television and radio. The last five years of the millennium witnessed another phenomenal rise in the markets, although the vast majority of this increase was confined to the technology arena. Small companies such as Dell Computer and Cisco Systems grew incredibly fast. The measurement of their sizes is a detail that needs to be examined. One measure is the value of sales, an indicator of the production of the company; another is the value of the share price and what we call the market capitalization, which indicate the investing public’s appraisal of value of the current and future production and profits. The market capitalization of Dell grew by thousands of percentage points over the decade; such increases are relatively rare in history, though not unprecedented.

The problem with the rapid growth in share values in technology is that it spurred increasing attention by unsophisticated investors, individuals who had no experience with the stock market. Such individuals were seduced by the media attention revealing the fortunes that were being made so quickly, with results as high as 100 percent gains overnight. An indication of the media effect is that the U.S. financial news network CNBC apparently became the most watched program on television, outstripping all those soap operas, game shows, and sitcoms that used to be more entertaining.

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<sup>1</sup>The Tulip Bulb Craze of the 1630s was a similar phenomenon. See [www.investopedia.com](http://www.investopedia.com) for a guide to past crashes.



The growth in the technology companies, measured globally by the value of the Nasdaq market index, was being described as a “bubble,” a term used many times before in history to describe the unwarranted inflation in asset values. Inevitably bubbles are punctured, and the most naïve investors lose the most money in the collapse, as they enter the bubbling market long after the initial gains have been made, just in time to watch their capital evaporate in the relentless return to pre-bubble prices. In this case, however, even experienced investors insisted on staying in the market, afraid to lose the opportunity to participate in the gains. By the time the euphoria of the new millennium had ended, the Nasdaq and its most overpriced stocks began their decline and the acceptance that it had indeed been a bubble became universal. What was surprising to many was the extent of the collapse; even those predicting a return to more rational and defensible valuation were amazed by the declines in the shares of highly profitable companies, Nortel being a prime example. As the market fell, the debate switched to whether the good companies were now bargains or still overpriced; those with the latter view proved to be correct for over a year. In market parlance, the great “bull market” of the 1990s turned into the “bear market” of the new millennium. The decline ended in October 2002, at a level more than 50 percent below the all-time high in 1999; by April 2006 the TSX had surpassed its prior record closing, and by July 2008 it had recorded a gain of over 180 percent on its 2002 bottom in one of the longest bull markets on record. The U.S. S&P 500 index had finally reached its previous record, gaining only 100 percent, reflecting the Canadian economy’s benefit from the commodity boom. Commodity reliance is a two-edged sword, however; in 2013 the tables turned, as the U.S. market surged by another 30 percent while the TSX barely moved.

The first decade of the new millennium brought a new bubble, this time in real assets rather than financial assets; commodities such as copper and oil and many food staples rose drastically in price, but the significant inflation occurred in real estate. Due in some part to the miscalculations of the Federal Reserve about the risk of deflation leading to insufficiently high interest rates, mortgages soared; borrowers normally considered poor credit risks, with the compliance of mortgage officers and banks, were able to finance the purchase of homes that should have been unaffordable. The mortgages issued were resold by banks through mortgage-backed securities (which we discuss below); other instruments backed by credit obligations were devised and circulated. The trading in these instruments created immense leverage that resulted in trillions of dollars of securities being circulated. Small and large investors bought and sold these securities without understanding the risk entailed by them, much of it due to the poor credit risks in the mortgage market. At the end of 2007, the cracks appeared in the credit market and it became clear that many of the largest banks in the world, who were inextricably entangled in these instruments, were effectively bankrupt as they were owed billions by other institutions that could not honour their obligations. The concentration of these holdings was in U.S., British, and European banks; Canadian banks, which had earlier participated in the game, had largely divested themselves of these credit instruments by the time of the collapse. In fact, the problem was at first more of a failure of faith in the ability to repay debts, as it had become clear that the underlying securities were deficient. With the parties to these contracts unable to trust others, no matter how big, the credit system froze, because credit is by definition faith. The final straw was the collapse in September 2008 of Lehman Brothers, one of the largest and oldest investment banks, as no one could be persuaded to rescue it.

Stock markets plunged, as investors understood that the world was on the verge of a financial collapse because of frozen credit. Governments and central banks stepped in to guarantee banks and deposits. By dropping the rate of interest to near zero, monetary policy attempted to restart borrowing, but this alone was insufficient. Bank balance sheets were destroyed by the need to value their assets at realistic estimates of their true value rather than their nominal values; those estimates depended on what they could sell the assets for in an open market, and the answer to that question was too often a fraction of the nominal value. Hence the government guarantees

## A NEW SCANDAL: LIBOR

Banking is a lucrative industry for the participants—not including customers. Yet recently the industry has suffered a few mishaps. Both investment and commercial bankers helped to create the greatest financial crisis in memory with the mortgage derivatives debacle that emerged in 2007. With the help of quite a few government bailouts, the industry survived, but it had to deal with the vast number of bad mortgages involved; that was mishandled by a practice of badly executed foreclosures leading to some extremely large fines. Not content with these blunders, banks were found to be colluding in a far more insidious practice that, while posing less of a threat to the financial system, indicates a lack of integrity that shatters banks' reputations as fitting custodians of the financial system. This was a case of fixing interest rates to their own benefit. Not that they don't already set rates for their own benefit, but manipulating a rate—specifically LIBOR—with international implications is different from setting prime.

**LIBOR** stands for **London Interbank Offered Rate**, which refers to short-term interest rates of 15 different periods in 10 currencies. The rates are calculated and published daily at 11:30 a.m. (GMT) by Thomson Reuters. Internationally, rates are set by other financial institutions, lenders, and credit card agencies relative to the

published LIBOR, with more than \$150 trillion of financial instruments affected.

In a process overseen by the British Bankers' Association, representatives of 7 to 18 banks report the rates they pay or would have to pay to borrow for short-term periods in various currencies from other banks. After removing outliers, the figures are averaged to arrive at a set of standards for borrowing and lending rates around the world. Loans are tied to those benchmarks similarly to the quote of a loan at "prime plus one-half." In consequence, organizations both public and private may have earned too little or paid too much in their financial dealings.

Investigations by British, American, and Canadian authorities revealed that the major international banks, including Barclays, UBS, Citigroup and Bank of America, had been either inflating or deflating (usually) the rate they reported. Lowering the rates allowed banks to appear healthier during the crisis with a lower cost of funds. At other times, a manipulated rate allowed investment bankers to profit from trading positions. The consequences of this discovery were significant. Barclays lost its chairman and its CEO by resignation and paid fines of about \$450 million; UBS agreed to a fine of \$1.5 billion, collected by U.S., British, and Swiss authorities. What next?

and purchases of bank equity. Fears of a new Great Depression were everywhere, but government action worked. By April 2009, markets round the world, which had collapsed by typically half their value, bottomed out, and a new bull market appeared to have started after only nine months of the bear market. The worldwide recession, more severe than any since the Great Depression, was still in effect, but by the end of 2009 economic statistics confirmed that it had ended by the third quarter in most countries.

Economists noted that, historically, recessions caused by financial crises, rather than by excess production and consumption leading to cyclical contractions, had far-longer-lasting effects. This proved to be the case, as world economies expanded slowly with less job creation and slipped back into recession in following years. Central banks engaged in the new practice of "quantitative easing," that is, expanding the money supply greatly through printing new money to purchase government securities. The ultimate effect of printing money is to spur inflation; inflation, however, was considered a far lesser evil than deflation, which has plagued Japan since the 1987 crash. Hence, policy strove to balance the two risks. (Bankers continued to create problems, however, as described in the nearby box.)

One factor blamed for the collapse was the use of complex derivative instruments, but the blame is misapplied. While derivatives were at the heart of the crisis, they were not themselves at fault. The ability to escape from the risk created by poor mortgages through derivatives was the culprit, but this was a failure of regulation, as was the excessive leverage in which financial institutions were able to engage. Also at fault was an excessive reliance on mathematical modelling that was not based on the underlying market realities. Models in general relied on the liquidity of the instruments they described, which liquidity disappeared far more rapidly than assumed; also, models failed to recognize the potential for rapid increases in volatility in the trading of these instruments and the resultant risk expansion.

Beneath this general account of the market's behaviour lies a complex subject that must be examined closely, with a variety of issues that will be addressed in this book. The end of the

twentieth century revealed a number of major mistakes by individual investors and by professionals, mistakes in the sense of their not following the precepts of investment analysis. This book will present the major concerns in investing, and how those concerns should be addressed. Much of it is theory and much is practice. Very often, the market will appear to contradict theoretical predictions, but over the long run most of the theory holds up well. Even if investors appear to ignore theory, if fortunes can be made thereby and, what is worse, if some theories prove inaccurate, it is essential to understand the theories. Much of professional practice pays more than lip service to the theoretical results of academic research. Careers in finance require familiarity with the theories, if only to realize how and when they are not being followed.

## 1.2

## THE ECONOMIC SYSTEM AND INVESTMENT

To many naïve observers of the market, professionals and individuals seem to be buying and selling shares in major corporations whose names are familiar because they provide well-known goods or services. They may then presume that every time such a trade occurs, on the other side of the transaction the shares are being sold or bought by those same corporations. However, if they thought it through, they might realize the enormity of such a process and begin to understand why something quite different is happening.

When investors buy or sell stocks, they are rarely trading with the company that issued the shares. Instead the trade is made with another investor, one who has an opposite idea of what the value of the company is—buyers think value is higher than the share price and sellers think the opposite. The price in the market is crucial to establishing a fair valuation of the shares. This ultimately becomes relevant to the corporation when it needs to issue new shares at a fair price, which only occurs when it requires new capital. The company itself is fairly remote from the trading, its interest lying only in what the trade price says about investor sentiment on its perceived financial prospects. The company gets involved only when it makes an issue of stock to the public to raise capital, or when, having excess capital, it decides to repurchase its shares.

Shares in companies exist because those companies need capital in order to expand and purchase physical assets. Companies must raise this capital from the investing public because they do not have sufficient funds to make all the investments in plant and equipment required for their growth. Investors have this capital because, in general, individuals have more funds than required for immediate needs; they can and wish to postpone their current consumption to save and build capital for later consumption.

In order to obtain capital, those with a deficit must issue securities, which are bought by those with excess funds. The types of securities or financial instruments involved will be defined formally in the following chapter, but we can begin by talking about stocks and bonds, issued by private corporations. Bonds are notes that acknowledge indebtedness and specify the terms of repayment; stocks are instruments that convey ownership rights to their holders, with no guarantee of any fixed, or even positive, return. Stocks enable investors to participate in business activities while being protected from the major drawbacks of individual ownership or partnership; they are relatively liquid, enabling the investor to extract the true value of the shares fairly quickly, and they offer limited liability, so that the greatest loss to be suffered is the investment itself, in the case of a catastrophe in the business.

### Real Investment Versus Financial Investment

The investment by individuals in stocks and bonds of corporations is identified as **financial investment**. For the most part, this occurs as investors enter the securities markets and exchange cash for the financial instruments. Since the cash is exchanged between investors and no new capital reaches the corporations, no **real investment** occurs as a result of this activity. Real

investment only occurs when a corporation takes capital and invests it in productive assets; this may come about as a result of reinvested profits, but major real investment requires the issuance of new debt or equity instruments.

Real investment is channelled into **real assets**, which determine the productive capacity of the economy. These real assets are the land, buildings, and machines, even the knowledge, necessary to produce goods, together with the workers and their skills in operating those resources. In contrast to real assets are **financial assets**, such as stocks or bonds. These assets, per se, do not represent a society's wealth. For example, shares of stock represent only ownership rights to assets; they do not directly contribute to the productive capacity of the economy. Financial assets instead contribute to the productive capacity of the economy *indirectly*, because they allow for separation of the ownership and management of the firm and facilitate the transfer of funds to enterprises with attractive investment opportunities. Financial assets certainly contribute to the wealth of the individuals or firms holding them, because they are claims on the income generated by real assets or on income from the government.

When the real assets used by a firm ultimately generate income, that income is allocated to investors according to their ownership of financial assets, or securities, issued by the firm. Bondholders, for example, are entitled to a flow of income based on the interest rate and par value of the bond. Equityholders or stockholders are entitled to any residual income after bondholders and other creditors are paid. In this way the values of financial assets are derived from and depend on the values of the underlying real assets of the firm.

Real assets are income-generating assets, whereas financial assets define the allocation of income or wealth among investors. Individuals can choose between consuming their current endowments of wealth today and investing for the future. When they invest for the future, they may choose to hold financial assets. The money a firm receives when it issues securities (sells them to investors) is used to purchase real assets. Ultimately, then, the returns on a financial asset come from the income produced by the real assets financed by the issuance of the security. In this way, it is useful to view financial assets as the means by which individuals hold their claims on real assets in well-developed economies. Most of us cannot personally own a bank, but we can hold shares of the Royal Bank or the Bank of Nova Scotia, which provide us with income derived from providing banking services.

An operational distinction between real and financial assets involves the balance sheets of individuals and firms in the economy. Real assets appear only on the asset side of the balance sheet. In contrast, financial assets always appear on both sides of balance sheets. Your financial claim on a firm is an asset for you, but the firm's issuance of that claim is the firm's liability. When we aggregate over all balance sheets, financial assets will cancel out, leaving only the sum of real assets as the net wealth of the aggregate economy. Another way of distinguishing between financial and real assets is to note that financial assets are created and destroyed in the ordinary course of doing business. For example, when a loan is paid off, both the creditor's claim (a financial asset) and the debtor's obligation (a financial liability) cease to exist. In contrast, real assets are destroyed only by accident or by wearing out over time.

**CC 1****CONCEPT CHECK**

Are the following assets real or financial?

- a. Patents
- b. Lease obligations
- c. Customer goodwill
- d. A university education
- e. A \$5 bill

## CC 2

## CONCEPT CHECK

Explain how a car loan from a bank creates both financial assets and financial liabilities.

Financial assets and the markets they trade in play several crucial roles that help ensure the efficient allocation of capital to real assets in the economy. One such function is the **informational role**. Stock prices reflect investors' collective assessment of a firm's current performance and future prospects. When the market is more optimistic about the firm, its share price will rise. That higher price makes it easier for the firm to raise capital and therefore encourages investment. In this manner, stock prices play a major role in the allocation of capital in market economies, directing capital to the firms and applications with the greatest perceived potential.

Do capital markets actually channel resources to the most efficient use? At times, they appear to fail miserably. Companies or whole industries can be "hot" for a period of time (think about the dot-com bubble that peaked in 2000), attract a large flow of investor capital, and then fail after only a few years. The process seems highly wasteful. But we need to be careful about our standard of efficiency. No one knows with certainty which ventures will succeed and which will fail. It is therefore unreasonable to expect that markets will never make mistakes. The market encourages allocation of capital to firms that seem to have prospects until such prospects no longer seem likely.

You may well be skeptical about resource allocation through markets. But if you are, then take a moment to think about the alternatives. Would a central planner make fewer mistakes? Would you prefer that politicians make these decisions? To paraphrase Winston Churchill's comment about democracy, markets may be the worst way to allocate capital except for all the others that have been tried.

Financial assets are also the vehicle enabling **consumption timing** by individuals. Some individuals in an economy are earning more than they currently wish to spend. Others, for example, retirees, spend more than they currently earn. How can you shift your purchasing power from high-earnings to low-earnings periods of life? One way is to "store" your wealth in financial assets. In high-earnings periods, you can invest your savings in financial assets such as stocks and bonds. In low-earnings periods, you can sell these assets to provide funds for your consumption needs. By so doing, you can "shift" your consumption over the course of your lifetime, thereby allocating your consumption to periods that provide the greatest satisfaction. Thus, financial markets allow individuals to separate decisions concerning current consumption from constraints that otherwise would be imposed by current earnings.

Financial assets provide the structure by which the **separation of ownership and management** occurs. With few exceptions large corporations are not owner-operated. Corporate executives are selected by boards of directors who oversee the management of the firm in accordance with the interests of the actual owners—the shareholders (some of whom will be the executives and directors themselves). This gives the firm a stability that the owner-managed firm cannot achieve. For example, if some stockholders decide they no longer wish to have holdings in the firm, they can sell their shares to other investors, with no impact on the management of the firm. Thus, financial assets and the ability to buy and sell those assets in the financial markets allow for easy separation of ownership and management.

How can all of the disparate owners of the firm, ranging from large pension funds holding hundreds of thousands of shares to small investors who may hold only a single share, agree on the objectives of the firm? Again, the financial markets provide some guidance. All may agree that the firm's management should pursue strategies that enhance the value of their shares. Such policies will make all shareholders wealthier and allow them all to better pursue their personal goals, whatever those might be.

Yet managers may not always attempt to maximize firm value. The possible substitution of personal interests for those of the owners is referred to as the **agency problem**. Several mechanisms have evolved to avoid such problems. First, compensation plans tie the income of managers to the success of the firm. A major part of the total compensation of top executives is typically in the form of stock options, which means that the managers will not do well unless the stock price increases, benefiting shareholders. (Of course, we've learned more recently that overuse of options can create its own agency problem. Options can create an incentive for managers to engage in excessively risky projects or manipulate information to prop up a stock price temporarily, giving them a chance to cash out before the price returns to a level reflective of the firm's true prospects.) Second, while boards of directors have sometimes been portrayed as defenders of top management, they can, and more recently have forced out management teams that are underperforming. The average tenure of CEOs fell from 8.1 years in 2006 to 6.6 years in 2011, and the percentage of incoming CEOs who also serve as chairman of the board of directors fell from 48 percent in 2002 to less than 12 percent in 2009. Third, outsiders such as security analysts or mutual funds and pension funds monitor the firm closely and make the life of poor performers at the least uncomfortable.

Finally, bad performers are subject to the threat of takeover. If the board of directors is lax in monitoring management, unhappy shareholders in principle can elect a different board. They can do this by launching a *proxy contest* in which they seek to obtain enough proxies (i.e., rights to vote the shares of other shareholders) to take control of the firm and vote in another board. However, this threat is usually minimal. Shareholders who attempt such a fight have to use their own funds, while management can defend itself using corporate coffers. Most proxy fights fail. The real takeover threat is from other firms. If one firm observes another underperforming, it can acquire the underperforming business and replace management with its own team. The stock price should rise to reflect the prospects of improved performance, which provides incentive for firms to engage in such takeover activity.

### 1.3

## THE PARTICIPANTS: INDIVIDUALS AND FINANCIAL INTERMEDIARIES

Essentially, there are three types of participants in financial markets:

1. Households typically are net suppliers of capital as savers. They purchase the securities issued by firms that need to raise funds.
2. Firms are net demanders of capital. They raise capital now to pay for investments in plant and equipment. The income generated by those real assets provides the returns to investors who purchase the securities issued by the firm.
3. Governments can be either, depending on the relationship between tax revenue and government expenditures. Most of the time, they spend more than they raise through taxation, although occasionally they succeed in running small surpluses. The picture is complicated by spending for investment in infrastructure and incurring liabilities for future payments of pensions.

### Individuals and Financial Objectives

The reader of a book on investments presumably has a good idea of what the objective of investing is—making a return on capital. This broad statement, however, encompasses a range of possibilities for the kind of return expected, as different kinds of investors will be attracted to strategies from the very conservative to the very risky, and at times to combinations of them, on