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Essentials of Investments

12e

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Essentials *of* Investments

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Brief Contents

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Contents

Organization of the Twelfth Edition

Twelfth Edition, is intended as a textbook on investment analysis most applicable for a student's first course in investments. The chapters are written in a modular format to give instructors the flexibility to either omit certain chapters or rearrange their order. The highlights in the margins describe updates and important features in this edition.

Part ONE

This part lays out the general framework for the investment process in a nontechnical manner. We discuss the major players in the financial markets and provide an overview of security types and trading mechanisms. These chapters make it possible for instructors to assign term projects analyzing securities early in the course.

- Investments: Background and Issues 2
- Asset Classes and Financial Instruments 28

Includes sections on securitization, the roots of the financial crisis, and the fallout from the crisis.

Extensive coverage of the rise of electronic markets, algorithmic and high-speed trading, and changes in market structure.

- Securities Markets 55
- Mutual Funds and Other Investment Companies 86

Includes coverage of innovations in exchange-traded funds.

Part TWO

This part contains the core of modern portfolio theory. For courses emphasizing security analysis, this part may be skipped without loss of continuity.

- Risk, Return, and the Historical Record 112

All data are updated and available on the web through the Connect resources. The data are used to discuss risk management and tail risk.

- Efficient Diversification 147

Introduces simple in-chapter spreadsheets that can be used to compute investment opportunity sets and the index model.

- Capital Asset Pricing and Arbitrage Pricing Theory 194

Includes single-factor as well as multifactor models.

- The Efficient Market Hypothesis 226

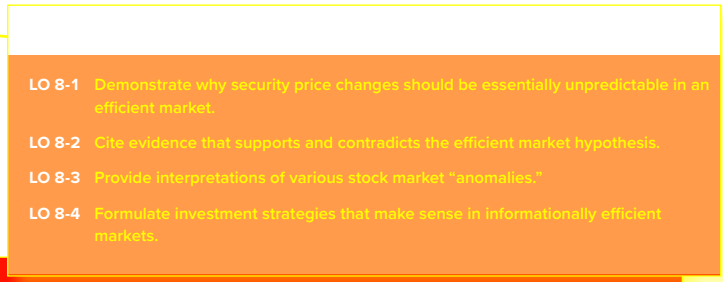
Considers evidence both supporting and refuting efficient markets.

- Behavioral Finance and Technical Analysis 258

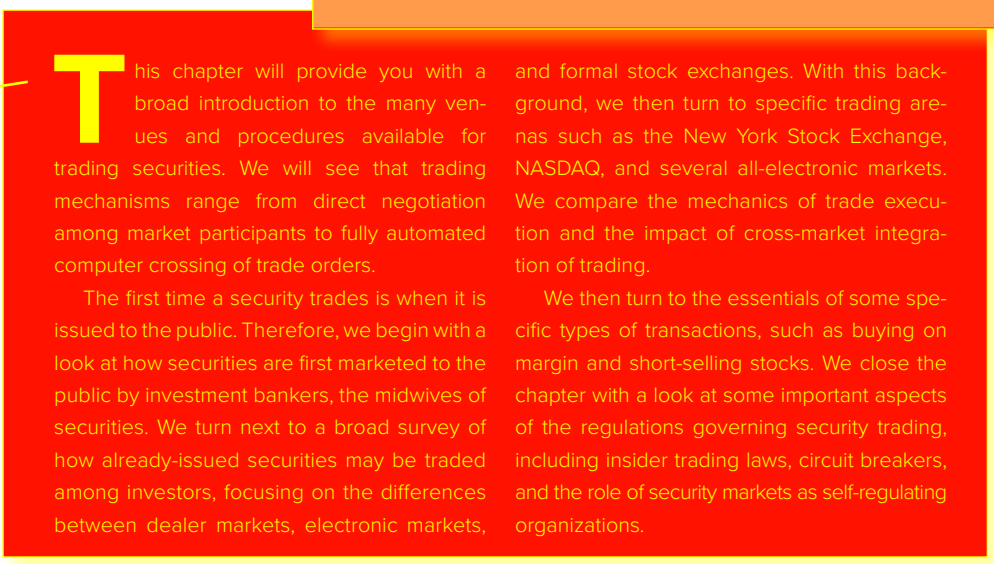
Contains extensive treatment of behavioral finance and provides an introduction to technical analysis.

Pedagogical Features

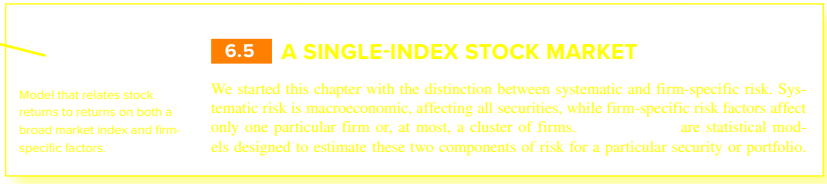
Each chapter begins with a summary of the chapter learning objectives, providing students with an overview of the concepts they should understand after reading the chapter. The end-of-chapter problems and CFA questions are tagged with the corresponding learning objective.



Each chapter begins with a brief narrative to explain the concepts that will be covered in more depth. Relevant web-sites related to chapter material can be found in Connect. These sites make it easy for students to research topics further and retrieve financial data and information.



Key terms are indicated in color and defined in the margin the first time the term is used. A full list of key terms is included in the end-of-chapter materials.



Key equations are called out in the text and identified by equation numbers. These key formulas are listed at the end of each chapter. Equations that are frequently used are also featured on the text's end sheets for convenient reference.

THE LIBOR SCANDALS

LIBOR was designed initially as a survey of interbank lending rates but soon became a key determinant of short-term interest rates with far-reaching significance. More than $500 trillion of derivative contracts have payoffs tied to it, and many trillion dollars of loans and bonds with floating interest rates linked to LIBOR are currently outstanding. LIBOR is quoted for loans in five currencies (the U.S. dollar, yen, euro, U.K. pound, and Swiss franc) for maturities ranging from a day to a year, although three months is the most common.

However, LIBOR is not a rate at which actual transactions occur; instead, it is just a survey of "estimated" borrowing rates, and this has made it vulnerable to manipulation. Several large banks are asked to report the rate at which they *claim* they can borrow in the interbank market. Outliers are trimmed from the sample of responses, and LIBOR is calculated as the average of the mid-range estimates.

Over time, several problems surfaced. First, it appeared that many banks understated the rates at which they claimed they could borrow in an effort to make themselves look financially stronger. Other surveys that asked for estimates of the rates at which *other* banks could borrow resulted in higher values. Moreover, LIBOR did not seem to reflect current market conditions. A majority of LIBOR submissions were unchanged from day to day even when other interest rates fluctuated, and LIBOR spreads showed surprisingly low correlation with other measures of credit risk.

Even worse, once the market came under scrutiny, it emerged that participating banks were colluding to manipulate their LIBOR

cartel essentially set up a "favor bank" to help each other move the survey average up or down depending on their trading positions.

To date, more than $6 billion of fines have been paid, among them, Deutsche Bank ($2.5 billion), UBS ($1.5 billion), Royal Bank of Scotland ($1.1 billion), Rabobank ($1 billion), and SocGen ($600 million). But government fines may be only the beginning. A federal appeals court in 2016 ruled that private lawsuits involving antitrust violations may proceed. Borrowers paying an interest rate tied to LIBOR argue that they were harmed by the collusion of participating banks to coordinate rates.

Several reforms have been suggested, and some have been implemented. The British Bankers Association, which until recently ran the LIBOR survey, yielded responsibility for LIBOR to British regulators. LIBOR quotes in less-active currencies and maturities, where collusion is easier, have been eliminated. More substantive proposals would replace the survey rates with ones based on actual, verifiable transactions—that is, real loans. British regulators have expressed their wish to phase out LIBOR by 2021. Two primary contenders to replace it are SONIA (Sterling Overnight Interbank Average Rate), an overnight interest rate in the U.K. market, and, for U.S. dollar rates, SOFR (secured overnight financing rate), the rate on repurchase agreements on Treasury securities.

These proposals leave some important questions unanswered. When LIBOR is phased out, what will happen to LIBOR-based long-term contracts with maturities that extend beyond 2021? For example, LIBOR is the most common index for adjustable

Current articles from financial publications such as *The Wall Street Journal* are featured as boxed readings. Each box is referred to within the narrative of the text, and its real-world relevance to the chapter material is clearly defined.

Why does it make sense for shelf registration to be limited in time?

CONCEPT
check

These self-test questions in the body of the chapter enable students to determine whether the preceding material has been understood and then reinforce understanding before students read further. Detailed Solutions to the Concept Checks are found at the end of each chapter.

Value-Weighted Indexes

To illustrate how value-weighted indexes are computed, look again at Table 2.3. The final value of all outstanding stock in our two-stock universe is $690 million. The initial value was $600 million. Therefore, if the initial level of a market value–weighted index of stocks ABC and XYZ were set equal to an arbitrarily chosen starting value such as 100, the index value at year-end would be $100 \times (690/600) = 115$. The increase in the index would reflect the 15% return earned on a portfolio consisting of those two stocks held in proportion to outstanding market values.

Unlike the price-weighted index, the value-weighted index gives more weight to ABC. Whereas the price-weighted index fell because it was dominated by higher-priced XYZ, the value-weighted index rose because it gave more weight to ABC, the stock with the higher total market value.

Note also from Tables 2.3 and 2.4 that market value–weighted indexes are unaffected by stock splits. The total market value of the outstanding XYZ stock increases from $100 million to $110 million regardless of the stock split, thereby rendering the split irrelevant to the performance of the index.

Numbered and titled examples are integrated in each chapter. Using the worked-out solutions to these examples as models, students can learn how to solve specific problems step-by-step as well as gain insight into general principles by seeing how they are applied to answer concrete questions.

Excel Integration

Excel Applications

Because many courses now require students to perform analyses in spreadsheet format, Excel has been integrated throughout the book. It is used in examples as well as in this chapter feature, which shows students how to create and manipulate spreadsheets to solve specific problems. This feature starts with an example presented in the chapter, briefly discusses how a spreadsheet can be valuable for investigating the topic, shows a sample spreadsheet, and asks students to apply the data to answer questions. These applications also direct the student to the web to work with an interactive version of the spreadsheet. The spreadsheet files are available for download in Connect; available spreadsheets are denoted by an icon. As extra guidance, the spreadsheets include a comment feature that documents both inputs and outputs. Solutions for these exercises are located on the password-protected instructor site only, so instructors can assign these exercises either for homework or just for practice.

Excel application spreadsheets are available for the following:

Chapter 3: Buying on Margin; Short Sales
Chapter 6: Estimating the Index Model
Chapter 11: Immunization; Convexity
Chapter 15: Options, Stock, and Lending; Straddles and Spreads
Chapter 17: Spot-Futures Parity
Chapter 18: Performance Measurement; Performance Attribution
Chapter 19: International Diversification

Spreadsheet exhibit templates are also available for the following:

Chapter 5: Spreadsheet 5.1
Chapter 6: Spreadsheets 6.1–6.6
Chapter 10: Spreadsheets 10.1 & 10.2
Chapter 11: Spreadsheets 11.1 & 11.2
Chapter 13: Spreadsheets 13.1 & 13.2
Chapter 16: Spreadsheet 16.1
Chapter 21: Spreadsheets 21.1–21.10

EXCEL APPLICATIONS

This spreadsheet is available in Connect

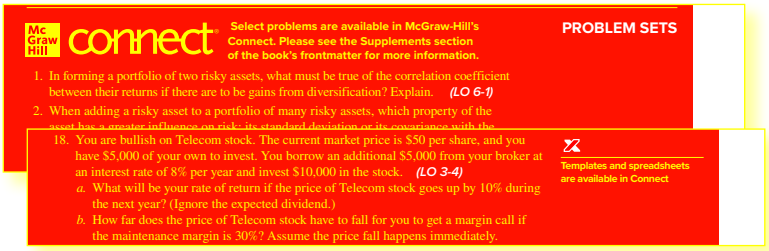
The Excel spreadsheet model below makes it easy to analyze the impacts of different margin levels and the volatility of stock prices. It also allows you to compare return on investment for a margin trade with a trade using no borrowed funds.

	A	B	C	D	E	F	G	H
1								
2			Action or Formula	Ending	Return on		Ending	Return with
3			for Column B	St Price	Investment		St Price	No Margin
4	Initial Equity Investment	$10,000.00	Enter data		−42.00%			−19.00%
5	Amount Borrowed	$10,000.00	(B4/B10)−B4	$20.00	−122.00%		$20.00	−59.00%
6	Initial Stock Price	$50.00	Enter data	25.00	−102.00%		25.00	−49.00%
7	Shares Purchased	400	(B4/B10)/B6	30.00	−82.00%		30.00	−39.00%
8	Ending Stock Price	$40.00	Enter data	35.00	−62.00%		35.00	−29.00%
9	Cash Dividends During Hold Per.	$0.50	Enter data	40.00	−42.00%		40.00	−19.00%
10	Initial Margin Percentage	50.00%	Enter data	45.00	−22.00%		45.00	−9.00%
11	Maintenance Margin Percentage	30.00%	Enter data	50.00	−2.00%		50.00	1.00%
12				55.00	18.00%		55.00	11.00%
13	Rate on Margin Loan	8.00%	Enter data	60.00	38.00%		60.00	21.00%
14	Holding Period in Months	6	Enter data	65.00	58.00%		65.00	31.00%
15				70.00	78.00%		70.00	41.00%
16	**Return on Investment**			75.00	98.00%		75.00	51.00%
17	Capital Gain on Stock	−$4,000.00	B7*(B8−B6)	80.00	118.00%		80.00	61.00%
18	Dividends	$200.00	B7*B9					
19	Interest on Margin Loan	$400.00	B5*(B14/12)*B13					
20	Net Income	−$4,200.00	B17+B18−B19			LEGEND:		
21	Initial Investment	$10,000.00	B4			Enter data		
22	Return on Investment	−42.00%	B20/B21			Value calculated		

Excel Questions

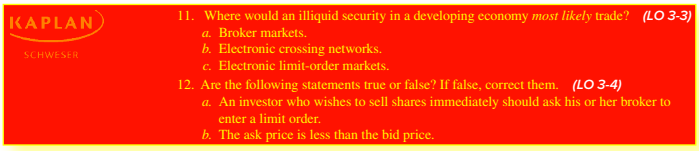
1. Suppose you buy 100 shares of stock initially selling for $50, borrowing 25% of the necessary funds from your broker; that is, the initial margin on your purchase is 25%. You pay an interest rate of 8% on margin loans.
   a. How much of your own money do you invest? How much do you borrow from your broker?
   b. What will be your rate of return for the following stock prices at the end of a one-year holding period? (i) $40; (ii) $50; (iii) $60.

End-of-Chapter Features

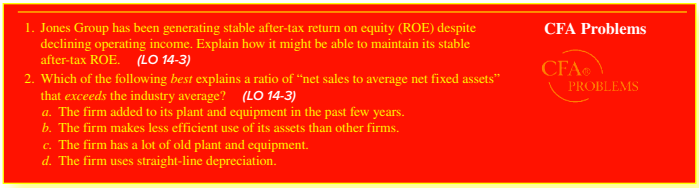


We strongly believe that practice in solving problems is a critical part of learning investments, so we provide a good variety. We have arranged questions by level of difficulty.

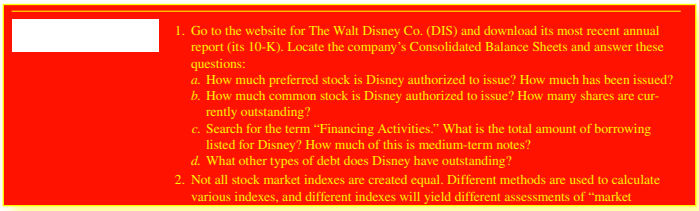
Select end-of-chapter questions require the use of Excel. These problems are denoted with an icon. Templates and spreadsheets are available in Connect.



Each chapter contains select CFA-style questions derived from the Kaplan-Schweser CFA preparation courses. These questions are tagged with an icon for easy reference.



We provide several questions from past CFA exams in applicable chapters. These questions represent the kinds of questions that professionals in the field believe are relevant to the practicing money manager. Appendix B, at the back of the book, lists each CFA question and the level and year of the CFA Exam it was included in, for easy reference when studying for the exam.



These exercises are a great way to allow students to test their skills on the Internet. Each exercise consists of an activity related to practical problems and real-world scenarios.

Supplements

McGraw Hill Connect is an online assignment and assessment solution that connects students with the tools and resources they'll need to achieve success.

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The Connect Instructor Library is your repository for additional resources to improve student engagement in and out of class. You can select and use any asset that enhances your lecture.

This library contains information about the book and the authors, as well as all of the instructor supplements for this text, including:

- **Instructor's Manual** Revised by Nicholas Racculia, St. Vincent College, this instructional tool provides an integrated learning approach revised for this edition. Each chapter includes a Chapter Overview, Learning Objectives, and Presentation of Material that outlines and organizes the material around the PowerPoint Presentation.
- **Solutions Manual** The Solutions Manual, carefully revised by the authors with assistance from Nicholas Racculia, contains solutions to all basic, intermediate, and challenge problems found at the end of each chapter.
- **Test Bank** Prepared by Nicholas Racculia, the Test Bank contains more than 1,200 questions and includes over 220 new questions. Each question is ranked by level of difficulty (easy, medium, hard) and tagged with the learning objective, the topic, AACSB, and Bloom's Taxonomy, which allows greater flexibility in creating a test. The Test Bank is assignable within Connect.
- **PowerPoint Presentations** These presentation slides, developed by Leslie Rush from the University of Hawaii, contain figures and tables from the text, key points, and summaries in a visually stimulating collection of slides. These slides follow the order of the chapters, but if you have PowerPoint software, you may customize the program to fit your lecture.

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- Jordan Cunningham,
  Eastern Washington University

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A Note from the Authors . . .

The past three decades witnessed rapid and profound change in the investment industry as well as a financial crisis of historic magnitude. The vast expansion of financial markets during this period was due in part to innovations in securitization and credit enhancement that gave birth to new trading strategies. These strategies were in turn made feasible by developments in communication and information technology, as well as by advances in the theory of investments.

Yet the crisis was also rooted in the cracks of these developments. Many of the innovations in security design facilitated high leverage and an exaggerated notion of the efficacy of risk transfer strategies. This engendered complacency about risk that was coupled with relaxation of regulation as well as reduced transparency that masked the precarious condition of many big players in the system.

Of necessity, our text has evolved along with financial markets. We devote considerable attention to recent breathtaking changes in market structure and trading technology. At the same time, however, many basic *principles* of investments remain important. We continue to organize the book around one basic theme—that security markets are nearly efficient, meaning that you should expect to find few obvious bargains in these markets. Given what we know about securities, their prices usually appropriately reflect their risk and return attributes; free lunches are few and far apart in markets as competitive as these. This starting point remains a powerful approach to security valuation and is remarkably profound in its implications for the design of investment strategies. While the degree of market efficiency is and will always be a matter of debate (in fact we devote a full chapter to the behavioral challenge to the efficient market hypothesis), we hope our discussions throughout the book convey a good dose of healthy skepticism concerning much conventional wisdom.

This text also places great emphasis on *asset allocation.* We prefer this emphasis for two important reasons. First, it corresponds to the procedure that most individuals actually follow when building an investment portfolio. 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, the asset allocation choice 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.

Our book also focuses on investment analysis, which allows us to present the practical applications of investment theory and to convey insights of practical value. We provide a systematic collection of Excel spreadsheets that give you tools to explore concepts more deeply. These spreadsheets are available as part of the Connect resources for this text and provide a taste of the sophisticated analytic tools available to professional investors.

In our efforts to link theory to practice, we also have attempted to make our approach consistent with that of the CFA Institute. The Institute administers an education and certification program to candidates seeking designation as a Chartered Financial Analyst (CFA). The CFA Institute curriculum represents the consensus of a committee of distinguished scholars and practitioners regarding the core of knowledge required by the investment professional. We continue to include questions from previous CFA exams in our end-of-chapter problems as well as CFA-style questions derived from the Kaplan-Schweser CFA preparation courses.

This text will introduce you to the major issues 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.

Elements of Investments

Even a cursory glance at *The Wall Street Journal* reveals a bewildering collection of securities, markets, and financial institutions. But although it may appear so, the financial environment is not chaotic: There is rhyme and reason behind the vast array of financial instruments and the markets in which they trade.

These introductory chapters provide a bird's-eye view of the investing environment. We will give you a tour of the major types of markets in which securities trade, the trading process, and the major players in these arenas. You will see that both markets and securities have evolved to meet the changing and complex needs of different participants in the financial system.

Markets innovate and compete with each other for traders' business just as vigorously as competitors in other industries. The competition between NASDAQ, the New York Stock Exchange (NYSE), and several other electronic and non-U.S. exchanges is fierce and public.

Trading practices can mean big money to investors. The explosive growth of online electronic trading has saved them many millions of dollars in trading costs. On the other hand, some worry that lightning-fast electronic trading has put the stability of security markets at risk. All agree, however, that these advances will continue to change the face of the investments industry, and Wall Street firms are scrambling to formulate strategies that respond to these changes.

These chapters will give you a good foundation with which to understand the basic types of securities and financial markets as well as how trading in those markets is conducted.

Chapters in This Part

Chapter

1

LO 1-1 Define an investment.

LO 1-2 Distinguish between real assets and financial assets.

LO 1-3 Explain the economic functions of financial markets and how various securities are related to the governance of the corporation.

LO 1-4 Describe the major steps in the construction of an investment portfolio.

LO 1-5 Identify different types of financial markets and the major participants in each of those markets.

LO 1-6 Explain the causes and consequences of the financial crisis of 2008–2009.

investment
Commitment of current resources in the expectation of deriving greater resources in the future.

An **investment** is the *current* commitment of money or other resources in the expectation of reaping *future* benefits. For example, an individual might purchase shares of stock anticipating that the future proceeds from the shares will justify both the time that her money is tied up as well as the risk of the investment. The time you will spend studying this text (not to mention its cost) also is an investment. You are forgoing either current leisure or the income you could be earning at a job in the expectation that your future career will be sufficiently enhanced to justify this commitment of time and effort. While these two investments differ in many ways, they share one key attribute that is central to all investments: You sacrifice something of value now, expecting to benefit from that sacrifice later.

This text can help you become an informed practitioner of investments. We will focus on investments in securities such as stocks, bonds, or derivative contracts, but much of what we discuss will be useful in the analysis of any type of investment. The text will provide you with background in the organization of various securities markets; will survey the valuation and risk management principles useful in particular markets, such as those for bonds or stocks; and will introduce you to the principles of portfolio construction.

Broadly speaking, this chapter addresses several topics that will provide a useful perspective for the material that is to come later. First, before delving into the topic of "investments," we consider the role of financial assets in the economy. We discuss the relationship between securities and the "real" assets that actually produce goods and services for consumers, and we consider why financial assets are important to the functioning of a developed economy. Given this background, we then take a first look at the types of decisions that confront investors as they assemble a portfolio of assets. These investment decisions are made in an environment where higher returns usually can be obtained only at the price of greater risk and in which it is rare to find assets that are so mispriced as to be obvious bargains. These themes—the risk-return trade-off and the efficient pricing of financial assets—are central to the investment process, so it is worth pausing for a brief discussion of their implications as we begin the text. These implications will be fleshed out in much greater detail in later chapters.

We provide an overview of the organization of security markets as well as its key participants. Finally, we discuss the financial crisis that began playing out in 2007 and peaked in 2008. The crisis dramatically illustrated the connections between the financial system and the "real" side of the economy. We look at the origins of the crisis and the lessons that may be drawn about systemic risk. We close the chapter with an overview of the remainder of the text.

1.1 REAL ASSETS VERSUS FINANCIAL ASSETS

The material wealth of a society is ultimately determined by the productive capacity of its economy, that is, the goods and services its members can create. This capacity is a function of the of the economy: the land, buildings, equipment, and knowledge that can be used to produce goods and services.

Assets used to produce goods and services.

In contrast to such real assets are such as stocks and bonds. Such securities historically were no more than sheets of paper (and today are far more likely to be computer entries), and do not directly contribute to the productive capacity of the economy. Instead, these assets are the means by which individuals in well-developed economies hold their claims on real assets. Financial assets are claims to the income generated by real assets (or claims on income from the government). If we cannot own our own auto plant (a real asset), we can still buy shares in Ford or Toyota (financial assets) and, thereby, share in the income derived from the production of automobiles.

Claims on real assets or the income generated by them.

While real assets generate net income to the economy, financial assets simply define the allocation of income or wealth among investors. When investors buy securities issued by companies, the firms use the money so raised to pay for real assets, such as plant, equipment, technology, or inventory. So investors' returns ultimately come from the income produced by the real assets that were financed by the issuance of those securities.

The distinction between real and financial assets is apparent when we compare the balance sheet of U.S. households, shown in Table 1.1, with the composition of national wealth in the United States, shown in Table 1.2. Household wealth includes financial assets such as bank accounts, corporate stock, or bonds. However, debt securities, which are financial assets of the households that hold them, are *liabilities* of the issuers of those securities. For example, a bond that you treat as an asset because it gives you a claim on interest income and repayment of principal from Toyota is a liability of Toyota, which is obligated to make these payments.

Balance sheet of U.S. households

Assets	$ Billion	% Total	Liabilities and Net Worth	$ Billion	% Total
Real assets					
Real estate	$ 29,551	23.7%	Mortgages	$ 10,624	8.5%
Consumer durables	5,590	4.5	Consumer credit	4,000	3.2
Other	658	0.5	Bank and other loans	989	0.8
Total real assets	$ 35,799	28.7%	Other	439	0.4
			Total liabilities	$ 16,051	12.9%
Financial assets					
Deposits and money market shares	$ 13,250	10.6%			
Life insurance reserves	1,692	1.4			
Pension reserves	26,493	21.2			
Corporate equity	17,494	14.0			
Equity in noncorp. business	12,996	10.4			
Mutual fund shares	8,814	7.1			
Debt securities	6,638	5.3			
Other	1,518	1.2			
Total financial assets	88,895	71.3	*Net worth*	$108,643	87.1%
Total	$124,694	100.0%		$124,694	100.0%

Note: Column sums may differ from total because of rounding error.

Source: *Flow of Funds Accounts of the United States,* Board of Governors of the Federal Reserve System, June 2019.

Domestic net worth

Assets	$ Billion
Commercial real estate	$19,011
Residential real estate	33,234
Equipment & intellectual property	9,068
Inventories	2,824
Consumer durables	5,530
Total	$69,667

Note: Column sums may differ from total because of rounding error.

Source: *Flow of Funds Accounts of the United States,* Board of Governors of the Federal Reserve System, June 2019.

Your asset is Toyota's liability. Therefore, when we aggregate over all balance sheets, these claims cancel out, leaving only real assets as the net wealth of the economy. National wealth consists of structures, equipment, inventories of goods, and land.[1]

[1] You might wonder why real assets held by households in Table 1.1 amount to $35,799 billion, while total real assets in the domestic economy (Table 1.2) are far larger, at $69,667 billion. A big part of the difference reflects the fact that real assets held by firms, for example, property, plant, and equipment, are included as *financial* assets of the household sector, specifically through the value of corporate equity and other stock market investments. Also, Table 1.2 includes assets of noncorporate businesses. Finally, there are some differences in valuation methods. For example, equity and stock investments in Table 1.1 are measured by market value, whereas plant and equipment in Table 1.2 are valued at replacement cost.

We will focus almost exclusively on financial assets. But keep in mind that the successes or failures of these financial assets ultimately depend on the performance of the underlying real assets.

CONCEPT check

Are the following assets real or financial?

a. Patents *b.* Lease obligations *c.* Customer goodwill

d. A college education *e.* A $5 bill

1.2 FINANCIAL ASSETS

It is common to distinguish among three broad types of financial assets: debt, equity, and derivatives. or promise either a fixed stream of income or a stream of income that is determined according to a specified formula. For example, a corporate bond typically promises that the bondholder will receive a fixed amount of interest each year. Other so-called floating-rate bonds promise payments that depend on current interest rates. For example, a bond may pay an interest rate that is fixed at two percentage points above the rate paid on U.S. Treasury bills. Unless the borrower is declared bankrupt, the payments on these securities are either fixed or determined by formula. For this reason, the investment performance of debt securities typically is least closely tied to the financial condition of the issuer.

Pay a specified cash flow over a specific period.

Fixed-income securities come in a tremendous variety of maturities and payment provisions. At one extreme, *money market* securities are short term, highly marketable, and generally of very low risk, for example, U.S. Treasury bills or bank certificates of deposit (CDs). In contrast, the fixed-income *capital market* includes long-term securities such as Treasury bonds, as well as bonds issued by federal agencies, state and local municipalities, and corporations. These bonds range from very safe in terms of default risk (for example, Treasury securities) to relatively risky (for example, high-yield or "junk" bonds). They also are designed with extremely diverse provisions regarding payments provided to the investor and protection against the bankruptcy of the issuer. We will take a first look at these securities in Chapter 2 and undertake a more detailed analysis of the fixed-income market in Part Three.

Unlike debt securities, common stock, or in a firm represents an ownership share in the corporation. Equityholders are not promised any particular payment. They receive any dividends the firm may pay and have prorated ownership in the real assets of the firm. If the firm is successful, the value of equity will increase; if not, it will decrease. The performance of equity investments, therefore, is tied directly to the success of the firm and its real assets. For this reason, equity investments tend to be riskier than investments in debt securities. Equity markets and equity valuation are the topics of Part Four.

An ownership share in a corporation.

Finally, such as options and futures contracts provide payoffs that are determined by the prices of *other* assets such as bond or stock prices. For example, a call option on a share of Intel stock might turn out to be worthless if Intel's share price remains below a threshold or "exercise" price such as $60 a share, but it can be quite valuable if the stock price rises above that level.[2] Derivative securities are so named because their values *derive* from the prices of other assets. For example, the value of the call option will depend on the price of Intel stock. Other important derivative securities are futures and swap contracts. We will treat these in Part Five.

Securities providing payoffs that depend on the values of other assets.

Derivatives have become an integral part of the investment environment. One use of derivatives, perhaps the primary use, is to hedge risks or transfer them to other parties. This is done successfully every day, and the use of these securities for risk management is so commonplace

[2] A call option is the right to buy a share of stock at a given exercise price on or before the option's expiration date. If the market price of Intel remains below $60 a share, the right to buy for $60 will turn out to be valueless. If the share price rises above $60 before the option expires, however, the option can be exercised to obtain the share for only $60.

that the multitrillion-dollar market in derivative assets is routinely taken for granted. Derivatives also can be used to take highly speculative positions, however. Every so often, one of these positions blows up, resulting in well-publicized losses of hundreds of millions of dollars. While these losses attract considerable attention, they do not negate the potential use of such securities as risk management tools. Derivatives will continue to play an important role in portfolio construction and the financial system. We will return to this topic later in the text.

Investors and corporations regularly encounter other financial markets as well. Firms engaged in international trade regularly transfer money back and forth between dollars and other currencies. In London alone, over $2.5 trillion of currency is traded each day in the market for foreign exchange, primarily through a network of the largest international banks.

Investors also might invest directly in some real assets. For example, dozens of commodities are traded on exchanges such as those of the CME Group (parent company of the Chicago Mercantile Exchange and several other exchanges). You can buy or sell corn, wheat, natural gas, gold, silver, and so on.

Commodity and derivative markets allow firms to adjust their exposure to various business risks. For example, a construction firm may lock in the price of copper by buying copper futures contracts, thus eliminating the risk of a sudden jump in the price of its raw materials. Wherever there is uncertainty, investors may be interested in trading, either to speculate or to lay off their risks, and a market may arise to meet that demand.

1.3 FINANCIAL MARKETS AND THE ECONOMY

We stated earlier that real assets determine the wealth of an economy, while financial assets merely represent claims on real assets. Nevertheless, financial assets and the markets in which they trade play several crucial roles in developed economies. Financial assets allow us to make the most of the economy's real assets.

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 and then collapsed 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 stock market encourages allocation of capital to those firms that appear *at the time* to have the best prospects. Many smart, well-trained, and well-paid professionals analyze the prospects of firms whose shares trade on the stock market. Stock prices reflect their collective judgment.

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 Congress 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.

Some individuals 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.

Virtually all real assets involve some risk. When Toyota builds its auto plants, for example, it cannot know for sure what cash flows those plants will generate. Financial markets and the diverse financial instruments traded in those markets allow investors with the greatest taste for risk to bear that risk, while other, less risk-tolerant individuals can, to a greater extent, stay on the sidelines. For example, if Toyota raises the funds to build its auto plant by selling both stocks and bonds to the public, the more optimistic or risk-tolerant investors can buy shares of stock in Toyota, while the more conservative ones can buy Toyota bonds. Because the bonds promise to provide a fixed payment, the stockholders bear most of the business risk but reap potentially higher rewards. Thus, capital markets allow the risk that is inherent to all investments to be borne by the investors most willing to bear it.

This allocation of risk also benefits the firms that need to raise capital to finance their investments. When investors are able to select security types with the risk-return characteristics that best suit their preferences, each security can be sold for the best possible price. This facilitates the process of building the economy's stock of real assets.

Many businesses are owned and managed by the same individual. This simple organization is well suited to small businesses and, in fact, was the most common form of business organization before the Industrial Revolution. Today, however, with global markets and large-scale production, the size and capital requirements of firms have skyrocketed. For example, at the end of 2019, ExxonMobil listed on its balance sheet about $250 billion of property, plant, and equipment and total assets in excess of $350 billion. Corporations of such size simply cannot exist as owner-operated firms. Exxon actually has over tens of thousands of stockholders with an ownership stake in the firm proportional to their holdings of shares.

Such a large group of individuals obviously cannot actively participate in the day-to-day management of the firm. Instead, they elect a board of directors that in turn hires and supervises the management of the firm. This structure means that the owners and managers of the firm are different parties. This gives the firm a stability that the owner-managed firm cannot achieve. For example, if some stockholders decide they no longer wish to hold shares 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? Financial markets can provide some guidance. While the particular goals of each corporation's many investors may vary widely, all shareholders will be better able to achieve those personal goals when the firm acts to enhance the value of their shares. For this reason, value maximization has for decades been widely accepted as a useful organizing principle for the firm. More recently, some observers have questioned this goal, arguing that the firm should attempt to balance the interests of its many "stakeholders," for example, employees, customers, suppliers, and communities. The nearby box examines this debate.

Do managers really attempt to maximize firm value? It is easy to see how they might be tempted to engage in activities not in the best interest of shareholders. For example, they might engage in empire building or avoid risky projects to protect their own jobs or overconsume luxuries such as corporate jets, reasoning that the cost of such perquisites is largely borne by

SHOULD FIRMS MAXIMIZE VALUE?

The overwhelming orthodoxy in the business community since the 1970s was that the goal of the firm should be to maximize value and that corporate governance, for example, incentive packages for top management, should be designed to encourage that goal. The idea was that when value is maximized, we will all be in a better position to pursue our personal goals, including, if we wish, support for "good causes." But in the wake of the financial crisis of 2008, increasing economic inequality, stagnant wages, job insecurity, and climate change, that consensus is much shakier today.

In 2019, America's Business Roundtable, a group of CEOs of the country's largest corporations, advocated for broader corporate goals that address the interests of other "stakeholders," including employees, customers, and the communities in which firms operate. Their argument is that firms need to recognize and respond to ethical and societal considerations beyond their private pursuit of profit. Perhaps not surprisingly, the proposal almost immediately drew criticism: The Council of Institutional Investors, a group of asset managers, attacked it as incompatible with a free-market system and a capitulation to political correctness.

Critics of value maximization argue that it does not provide incentives to firms to respond to the important societal and economic challenges cited above. Moreover, some worry that firms tend to neglect long-term goals in the pursuit of short-term profits that might prop up its stock price. More fundamentally, if firms concern themselves only with their own value, they will ignore potential value-*reducing* impacts of their actions on other players. Should a firm increase its value by a trivial amount if it thereby increases unemployment for a large number of workers? Should it increase its value by gutting pension plans established for its former employees? Several observers, particularly on the left, argue that firms should be encouraged and perhaps forced to take a broader view of their obligations to their many stakeholders.

On the other hand, traditionalists are wary of an unfocused commitment to many competing and unspecified interests that could impede accountability. Would poorly performing managers be able to write off failures as due to the pursuit of noneconomic goals? Who will set these goals, and how much power is it appropriate to give to nonshareholders with little skin in the game? What incentives will remain for innovation and risk taking if corporate goals are set in the political arena? Is it right to downplay the importance of monetary success? After all, many institutions devoted to the public good and the economic security of individuals rely on the success of the endowment funds and pension funds that help pay for their activities. Finally, regardless of their preferences, competition may force firms to pursue value-maximizing strategies—if they don't, they run the risk that competitors who do will eat their lunch.

How might one thread this needle? One middle-ground approach focuses on encouraging *enlightened* self-interest. It can be value maximizing to establish a reputation as a good place to work if that helps the firm attract and retain good employees. It can be value maximizing to avoid scandal, disruption, and fines. It also can be value maximizing to provide products and treat customers in a manner that encourages repeat business. And if customers want goods produced by well-treated workers using environmentally responsible practices, it will be in the firm's interest to design production processes with those goals in mind. Consumers also vote with their feet, and firms that wish to do well may face pressure to do good. Advocates of ESG (environmental, social, governance) investing strategies argue that long-term value maximization requires consideration of ethical and sustainable business practices. Indeed, according to the Global Sustainable Investing Alliance, the sustainable investing sector grew by about one-third in 2019 to over $30 trillion in assets.

Of course, it would be naïve to believe that there will never be conflicts between value maximization, even maximization of long-term value, and other social considerations. Potential conflicts may call for government intervention to nudge incentives in one direction or the other. For example, governments may tax polluting activities to make it value maximizing to reduce emissions. They may set and enforce antitrust rules to foster competition and prevent any one firm from becoming powerful enough to ride roughshod over the interests of customers and employees. They can demand transparency to allow outsiders to make informed judgments of how the company is behaving.

The world is full of slippery slopes and competing goals, and no economic system will, at all times and in all places, arrive at the best compromise between narrow self-interest and broader social impact. Enlightened capitalism that recognizes that long-term success is compatible with, and in fact may demand, consideration of the wider implications of corporate actions may strike as good a balance as one can hope for.

Conflicts of interest between managers and stockholders.

the shareholders. These potential conflicts of interest are called because managers, who are hired as agents of the shareholders, may pursue their own interests instead.

Several mechanisms have evolved to mitigate potential agency 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 shares or stock options, which means that the managers will not do well unless the stock price increases, benefiting shareholders. (Of course, we've learned that overuse of options can create its own agency problem. Options can create an incentive for managers to 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. More on this shortly.) Second, while boards of directors have sometimes been portrayed as defenders of top management, they can, and in recent years increasingly

have, forced out management teams that are underperforming. Third, outsiders such as security analysts and large institutional investors such as mutual funds or pension funds monitor the firm closely and make the life of poor performers at the least uncomfortable. Such large investors today hold about half of the stock in publicly listed firms in the United States.

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. Historically, this threat was usually minimal. Shareholders who attempt such a fight have to use their own funds, while management can defend itself using corporate coffers.

However, in recent years, the odds of a successful proxy contest have increased along with the rise of so-called activist investors. These are large and deep-pocketed investors, often hedge funds, that identify firms they believe to be mismanaged in some respect. They can buy large positions in shares of those firms, and then campaign for slots on the board of directors and/or for specific reforms.

Aside from proxy contests, 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 an incentive for firms to engage in such takeover activity.

Activist Investors and Corporate Control

Here are a few of the better known activist investors, along with a sample of their more notable initiatives.

- Nelson Peltz, Trian. Trian gained a seat on General Electric's board of directors and pressured the company to cut costs; to return capital to shareholders, for example, through stock buybacks; and to downsize the firm.
- William Ackman, Pershing Square. Pushed for a merger between pharmaceutical firms Valeant and Allergan.
- Dan Loeb, Third Point. Attempted to replace the entire board of Campbell Soup and accelerate Campbell's divestiture and restructuring of struggling business units. Eventually settled for the right to nominate two new board members.
- Carl Icahn. One of the earliest and most combative of activist investors. Invested $100 million in Lyft, helping to fund its battle for market share in the ride-sharing industry.
- Christer Gardell, Cevian Capital. Cevian is the largest activist firm in Europe, with large stakes in Volvo, ABB, and Danske Bank.
- Paul Singer, Elliott Management. Took a $3.2 billion stake in AT&T in 2019, criticized AT&T's acquisitions of several media companies, questioned recent changes in the ranks of its top executives, and suggested that the firm add some new members to its board.

We've argued that securities markets can play an important role in facilitating the deployment of capital resources to their most productive uses. But market signals will help to allocate capital efficiently only if investors are acting on accurate information. We say that markets need to be *transparent* for investors to make informed decisions. If firms can mislead the public about their prospects, then much can go wrong.

Despite the many mechanisms to align incentives of shareholders and managers, the three years from 2000 through 2002 were filled with a seemingly unending series of scandals that collectively signaled a crisis in corporate governance and ethics. For example, the telecom firm WorldCom overstated its profits by at least $3.8 billion by improperly classifying expenses as investments. When the true picture emerged, it resulted in the largest bankruptcy in U.S. history, at least until Lehman Brothers smashed that record in 2008. The next-largest U.S. bankruptcy was Enron, which used its now notorious "special purpose entities" to move debt off its own books and similarly present a misleading picture of its financial status.

Unfortunately, these firms had plenty of company. Other firms such as Rite Aid, HealthSouth, Global Crossing, and Qwest Communications also manipulated and misstated their accounts to the tune of billions of dollars. And the scandals were hardly limited to the United States. Parmalat, the Italian dairy firm, claimed to have a $4.8 billion bank account that turned out not to exist. These episodes suggest that agency and incentive problems are far from solved and that transparency is far from complete.

Other scandals of that period included systematically misleading and overly optimistic research reports put out by stock market analysts (their favorable analysis was traded for the promise of future investment banking business, and analysts were commonly compensated not for their accuracy or insight but for their role in garnering investment banking business for their firms) and allocations of initial public offerings (IPOs) to corporate executives as a quid pro quo for personal favors or the promise to direct future business back to the manager of the IPO.

What about the auditors who were supposed to be the watchdogs of the firms? Here too, incentives were skewed. Recent changes in business practice made the consulting businesses of these firms more lucrative than the auditing function. For example, Enron's (now defunct) auditor Arthur Andersen earned more money consulting for Enron than auditing it; given its incentive to protect its consulting profits, it should not be surprising that it, and other auditors, were overly lenient in their auditing work.

In 2002, in response to the spate of ethics scandals, Congress passed the Sarbanes-Oxley Act, commonly referred to as SOX, to tighten the rules of corporate governance and disclosure. For example, the act requires corporations to have more independent directors, that is, more directors who are not themselves managers (or affiliated with managers). The act also requires each CFO to personally vouch for the corporation's accounting statements, provides for an oversight board to oversee the auditing of public companies, and prohibits auditors from providing various other services to clients.

1.4 THE INVESTMENT PROCESS

An investor's *portfolio* is simply his collection of investment assets. Once the portfolio is established, it is updated or "rebalanced" by selling existing securities and using the proceeds to buy new securities, by investing additional funds to increase the overall size of the portfolio, or by selling securities to decrease the size of the portfolio.

Investment assets can be categorized into broad asset classes, such as stocks, bonds, real estate, commodities, and so on. Investors make two types of decisions in constructing their portfolios. The decision is the choice among these broad asset classes, while the decision is the choice of which particular securities to hold *within* each asset class.

Allocation of an investment portfolio across broad asset classes.

Choice of specific securities within each asset class.

"Top-down" portfolio construction starts with asset allocation. For example, an individual who currently holds all of his money in a bank account would first decide what proportion of the overall portfolio ought to be moved into stocks, bonds, and so on. In this way, the broad features of the portfolio are established. For example, while the average annual return on the common stock of large firms since 1926 has been about 12% per year, the average return on U.S. Treasury bills has been less than 4%. On the other hand, stocks are far riskier, with annual returns (as measured by the Standard & Poor's 500 Index) that have ranged as low as –46% and as high as 55%. In contrast, T-bill returns are effectively risk free: You know what interest rate you will earn when you buy the bills. Therefore, the decision to allocate your investments to the stock market or to the money market where Treasury bills are traded will have great ramifications for both the risk and the return of your portfolio. A top-down investor first makes this and other crucial asset allocation decisions before turning to the decision of the particular securities to be held in each asset class.

involves the valuation of particular securities that might be included in the portfolio. For example, an investor might ask whether Merck or Pfizer is more attractively priced. Both bonds and stocks must be evaluated for investment attractiveness, but valuation

Analysis of the value of securities.

is far more difficult for stocks because a stock's performance usually is far more sensitive to the condition of the issuing firm.

In contrast to top-down portfolio management is the "bottom-up" strategy. In this process, the portfolio is constructed from securities that seem attractively priced without as much concern for the resultant asset allocation. Such a technique can result in unintended bets on one or another sector of the economy. For example, it might turn out that the portfolio ends up with a very heavy representation of firms in one industry, from one part of the country, or with exposure to one source of uncertainty. However, a bottom-up strategy does focus the portfolio on the assets that seem to offer the most attractive investment opportunities.

1.5 MARKETS ARE COMPETITIVE

Financial markets are highly competitive. Thousands of well-backed analysts constantly scour securities markets searching for the best buys. This competition means that we should expect to find few, if any, "free lunches," securities that are so underpriced that they represent obvious bargains. There are several implications of this no-free-lunch proposition. Let's examine two.

Investors invest for anticipated future returns, but those returns rarely can be predicted precisely. There will almost always be risk associated with investments. Actual or realized returns will almost always deviate from the expected return anticipated at the start of the investment period. For example, in 1931 (the worst calendar year for the market since 1926), the stock market lost 46% of its value. In 1933 (the best year), the stock market gained 55%. You can be sure that investors did not anticipate such extreme performance at the start of either of these years.

Naturally, if all else could be held equal, investors would prefer investments with the highest expected return.[3] However, the no-free-lunch rule tells us that all else cannot be held equal. If you want higher expected returns, you will have to pay a price in terms of accepting higher investment risk. If any particular asset offered a higher expected return without imposing extra risk, investors would rush to buy it, with the result that its price would be driven up. Individuals considering investing in the asset at the now-higher price would find the investment less attractive. The price will rise until its expected return is no more than commensurate with risk. At this point, investors can anticipate a "fair" return relative to the asset's risk, but no more.

Similarly, if returns were independent of risk, there would be a rush to sell high-risk assets. Their prices would fall (improving their expected future rates of return) until they eventually were attractive enough to be included again in investor portfolios. We conclude that there should be a in the securities markets, with higher-risk assets priced to offer higher expected returns than lower-risk assets.

Assets with higher expected returns entail greater risk.

Of course, this discussion leaves several important questions unanswered. How should one measure the risk of an asset? What should be the quantitative trade-off between risk (properly measured) and expected return? One would think that risk would have something to do with the volatility of an asset's returns, but this guess turns out to be only partly correct. When we mix assets into diversified portfolios, we need to consider the interplay among assets and the effect of diversification on the risk of the entire portfolio. *Diversification* means that many assets are held in the portfolio so that the exposure to any particular asset is limited. The effect of diversification on portfolio risk, the implications for the proper measurement of risk, and the risk-return relationship are the topics of Part Two. These topics are the subject of what has come to be known as *modern portfolio theory*. The development of this theory brought two of its pioneers, Harry Markowitz and William Sharpe, Nobel Prizes.

[3] The "expected" return is not the return investors believe they necessarily will earn, or even their most likely return. It is instead the result of averaging across all possible outcomes, recognizing that some outcomes are more likely than others. It is the average rate of return across possible economic scenarios.

Another implication of the no-free-lunch proposition is that we should rarely expect to find bargains in the security markets. We will spend all of Chapter 8 examining the theory and evidence concerning the hypothesis that financial markets process all available information about securities quickly and efficiently, that is, that the security price usually reflects all the information available to investors concerning the value of the security. According to this hypothesis, as new information about a security becomes available, the price of the security quickly adjusts so that at any time, the security price equals the market consensus estimate of the value of the security. If this were so, there would be neither underpriced nor overpriced securities.

One interesting implication of this "efficient market hypothesis" concerns the choice between active and passive investment-management strategies. calls for holding highly diversified portfolios without spending effort or other resources attempting to improve investment performance through security analysis. is the attempt to improve performance either by identifying mispriced securities or by timing the performance of broad asset classes—for example, increasing one's commitment to stocks when one is bullish on the stock market. If markets are efficient and prices reflect all relevant information, perhaps it is better to follow passive strategies instead of spending resources in a futile attempt to outguess your competitors in the financial markets.

Buying and holding a diversified portfolio without attempting to identify mispriced securities.

Attempting to identify mispriced securities or to forecast broad market trends.

If the efficient market hypothesis were taken to the extreme, there would be no point in active security analysis; only fools would commit resources to actively analyze securities. Without ongoing security analysis, however, prices eventually would depart from "correct" values, creating new incentives for experts to move in. Therefore, in Chapter 9, we examine challenges to the efficient market hypothesis. Even in environments as competitive as the financial markets, we may observe only *near*-efficiency, and profit opportunities may exist for especially insightful and creative investors. This motivates our discussion of active portfolio management in Part Six. Nevertheless, our discussions of security analysis and portfolio construction generally must account for the likelihood of nearly efficient markets.

1.6 THE PLAYERS

From a bird's-eye view, there would appear to be three major players in the financial markets:

1. 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.
2. Households typically are suppliers of capital. They purchase the securities issued by firms that need to raise funds.
3. Governments can be borrowers or lenders, depending on the relationship between tax revenue and government expenditures. Since World War II, the U.S. government typically has run budget deficits, meaning that its tax receipts have been less than its expenditures. The government, therefore, has had to borrow funds to cover its budget deficit. Issuance of Treasury bills, notes, and bonds is the major way that the government borrows funds from the public. In contrast, in the latter part of the 1990s, the government enjoyed a budget surplus and was able to retire some outstanding debt.

Corporations and governments do not sell all or even most of their securities directly to individuals. For example, about half of all stock is held by large financial institutions such as pension funds, mutual funds, insurance companies, and banks. These financial institutions stand between the security issuer (the firm) and the ultimate owner of the security (the individual investor). For this reason, they are called *financial intermediaries*. Similarly, corporations do not directly market their securities to the public. Instead, they hire agents, called investment bankers, to represent them to the investing public. Let's examine the roles of these intermediaries.

Households want desirable investments for their savings, yet the small (financial) size of most households makes direct investment difficult. A small investor seeking to lend money to businesses that need to finance investments doesn't advertise in the local newspaper to find a willing and desirable borrower. Moreover, an individual lender would not be able to diversify across borrowers to reduce risk. Finally, an individual lender is not equipped to assess and monitor the credit risk of borrowers.

For these reasons, have evolved to bring together the suppliers of capital (investors) with the demanders of capital (primarily corporations and the federal government). These financial intermediaries include banks, investment companies, insurance companies, and credit unions. Financial intermediaries issue their own securities to raise funds to purchase the securities of other corporations.

Institutions that "connect" borrowers and lenders by accepting funds from lenders and loaning funds to borrowers.

For example, a bank raises funds by borrowing (taking deposits) and lending that money to other borrowers. The spread between the interest rates paid to depositors and the rates charged to borrowers is the source of the bank's profit. In this way, lenders and borrowers do not need to contact each other directly. Instead, each goes to the bank, which acts as an intermediary between the two. The problem of matching lenders with borrowers is solved when each comes independently to the common intermediary.

Financial intermediaries are distinguished from other businesses in that both their assets and their liabilities are overwhelmingly financial. Table 1.3 presents the aggregated balance sheet of commercial banks, one of the largest sectors of financial intermediaries. Notice that the balance sheet includes only very small amounts of real assets. Compare Table 1.3 to the aggregated balance sheet of the nonfinancial corporate sector in Table 1.4, for which real assets are about half of all assets. The contrast arises because intermediaries simply move funds from one sector to another. In fact, the primary social function of such intermediaries is to channel household savings to the business sector.

Other examples of financial intermediaries are investment companies, insurance companies, and credit unions. All these firms offer similar advantages in their intermediary role.

Balance sheet of FDIC-Insured Commercial Banks and Savings Institutions

Assets	$ Billion	% Total	Liabilities and Net Worth	$ Billion	% Total
Real assets			**Liabilities**		
Equipment and premises	$ 177.6	1.0%	Deposits	$13,925.7	77.0%
Other real estate	6.6	0.0	Debt and other borrowed funds	1,199.8	6.6
Total real assets	$ 184.2	1.0%	Federal funds and repurchase agreements	264.8	1.5
			Other	639.7	3.5
			Total liabilities	$16,030.0	88.6%
Financial assets					
Cash	$ 1,699.7	9.4%			
Investment securities	3,724.4	20.6			
Loans and leases	10,022.2	55.4			
Other financial assets	1,270.7	7.0			
Total financial assets	$16,717.0	92.4%			
Other assets					
Intangible assets	$ 399.3	2.2%			
Other	789.6	4.4			
Total other assets	$ 1,188.9	6.6%	*Net worth*	$ 2,060.1	11.4%
Total	$18,090.1	100.0%		$18,090.1	100.0%

Note: Column sums may differ from total because of rounding error.

Source: Federal Deposit Insurance Corporation, www.fdic.gov, August 2019.

Balance sheet of U.S. nonfinancial corporations

Assets	$ Billion	% Total	Liabilities and Net Worth	$ Billion	% Total
Real assets			**Liabilities**		
Equipment & intellectual property	$ 7,874	17.3%	Bonds and mortgages	$ 6,407	14.0%
Real estate	13,472	29.5	Bank loans & mortgages	1,743	3.8
Inventories	2,561	5.6	Other loans	1,776	3.9
Total real assets	$23,907	52.4%	Trade debt	2,518	5.5
			Other	7,437	16.3
Financial assets			*Total liabilities*	$19,881	43.6%
Deposits and cash	$ 1,151	2.5%			
Marketable securities	2,979	6.5			
Trade and consumer credit	3,343	7.3			
Other	14,263	31.2			
Total financial assets	21,736	47.6	*Net worth*	$25,762	56.4%
Total	$45,643	100.0%		$45,643	100.0%

Note: Column sums may differ from total because of rounding error.

Source: *Flow of Funds Accounts of the United States,* Board of Governors of the Federal Reserve System, June 2019.

First, by pooling the resources of many small investors, they are able to lend considerable sums to large borrowers. Second, by lending to many borrowers, intermediaries achieve significant diversification, so they can accept loans that individually might otherwise be too risky. Third, intermediaries build expertise through the volume of business they do and can use economies of scale and scope to assess and monitor risk.

Firms managing funds for investors. An investment company may manage several mutual funds.

which pool and manage the money of many investors, also arise out of economies of scale. Here, the problem is that most household portfolios are not large enough to be spread among a wide variety of securities. It is very expensive in terms of brokerage fees and research costs to purchase one or two shares of many different firms. Mutual funds have the advantage of large-scale trading and portfolio management, while participating investors are assigned a prorated share of the total funds according to the size of their investment. This system gives small investors advantages they are willing to pay for via a management fee to the mutual fund operator.

Investment companies also can design portfolios specifically for large investors with particular goals. In contrast, mutual funds are sold in the retail market, and their investment philosophies are differentiated mainly by strategies that are likely to attract a large number of clients.

Like mutual funds, *hedge funds* also pool and invest the money of many clients. But they are open only to institutional investors such as pension funds, endowment funds, or wealthy individuals. They are more likely to pursue complex and higher-risk strategies. They typically keep a portion of trading profits as part of their fees, whereas mutual funds charge a fixed percentage of assets under management.

Economies of scale also explain the proliferation of analytic services available to investors. Newsletters, databases, and brokerage house research services all engage in research to be sold to a large client base. This setup arises naturally. Investors clearly want information, but with small portfolios to manage, they do not find it economical to personally gather all of it. Hence, a profit opportunity emerges: A firm can perform this service for many clients and charge for it.

Just as economies of scale and specialization create profit opportunities for financial intermediaries, these economies also create niches for firms that perform specialized services for businesses. Firms raise much of their capital by selling securities such as stocks and bonds to

SEPARATING COMMERCIAL BANKING FROM THE INVESTMENT BANKING INDUSTRY

Until 1999, the Glass-Steagall Act prohibited banks from both accepting deposits and underwriting securities. In other words, it forced a separation of the investment and commercial banking industries. But when Glass-Steagall was repealed, many large commercial banks began to transform themselves into "universal banks" that could offer a full range of commercial and investment banking services. In some cases, commercial banks started their own investment banking divisions from scratch, but more commonly they expanded through merger. For example, Chase Manhattan acquired J. P. Morgan to form JPMorgan Chase. Similarly, Citigroup acquired Salomon Smith Barney to offer wealth management, brokerage, investment banking, and asset management services to its clients. Most of Europe had never forced the separation of commercial and investment banking, so their giant banks such as Credit Suisse, Deutsche Bank, HSBC, and UBS had long been universal banks. Until 2008, however, the stand-alone investment banking sector in the United States remained large and apparently vibrant, including such storied names as Goldman Sachs, Morgan Stanley, Merrill Lynch, and Lehman Brothers.

But the industry was shaken to its core in 2008, when several investment banks were beset by enormous losses on their holdings of mortgage-backed securities. In March, on the verge of insolvency, Bear Stearns was merged into JPMorgan Chase. On September 14, 2008, Merrill Lynch, also suffering steep mortgage-related losses, negotiated an agreement to be acquired by Bank of America. The next day, Lehman Brothers entered into the largest bankruptcy in U.S. history, having failed to find an acquirer who was able and willing to rescue it from its steep losses. The next week, the only two remaining major independent investment banks, Goldman Sachs and Morgan Stanley, decided to convert from investment banks to traditional bank holding companies. In so doing, they became subject to the supervision of national bank regulators such as the Federal Reserve and the far tighter rules for capital adequacy that govern commercial banks.[4] The firms decided that the greater stability they would enjoy as traditional banks, particularly the ability to fund their operations through bank deposits and access to emergency borrowing from the Fed, justified the conversion. These mergers and conversions marked the effective end of the independent investment banking industry—but not of investment banking. Those services are now supplied by the large universal banks.

The debate about the separation between commercial and investment banking that seemed to have ended with the repeal of Glass-Steagall has come back to life. The Dodd-Frank Wall Street Reform and Consumer Protection Act places new restrictions on bank activities.

For example, the Volcker Rule, named after former chairman of the Federal Reserve Paul Volcker, prohibits banks from "proprietary trading," that is, trading securities for their own accounts, and restricts their investments in hedge funds or private equity funds. The rule is meant to limit the risk that banks can take on. While the Volcker Rule is less restrictive than Glass-Steagall had been, both are motivated by the belief that banks enjoying federal guarantees should be subject to limits on the sorts of activities in which they can engage.

Proprietary trading is a core activity for investment banks, so limitations on this activity for commercial banks reintroduces a separation between these business models. However, the limitations on such trading have elicited push-back from the industry, which argues that they have resulted in a brain drain of top traders from banks into hedge funds. In 2018, the Dodd-Frank bill was in effect partially repealed when new legislation granted all but the largest banks exemptions from some of its regulations.

the public. Because these firms do not do so frequently, however, that specialize in such activities can offer their services at a cost below that of maintaining an in-house security issuance division.

Investment bankers advise an issuing corporation on the prices it can charge for the securities issued, appropriate interest rates, and so forth. Ultimately, the investment banking firm handles the marketing of the security in the where new issues of securities are offered to the public. In this role, the banks are called *underwriters*. Later, investors can trade previously issued securities among themselves in the so-called

For most of the last century, investment banks and commercial banks in the United States were separated by law. While those regulations were effectively eliminated in 1999, until 2008 the industry known as "Wall Street" still comprised large, independent investment banks such as Goldman Sachs, Merrill Lynch, or Lehman Brothers. But that stand-alone model came to an abrupt end in September 2008, when all the remaining major U.S. investment banks were absorbed into commercial banks, declared bankruptcy, or reorganized as commercial banks. The nearby box presents a brief introduction to these events.

Firms specializing in the sale of new securities to the public, typically by underwriting the issue.

A market in which new issues of securities are offered to the public.

Markets in which previously issued securities are traded among investors.

[4] For example, a typical leverage ratio (total assets divided by bank capital) at commercial banks in 2008 was about 10 to 1. In contrast, leverage at investment banks reached 30 to 1. Such leverage increased profits when times were good but provided an inadequate buffer against losses and left the banks exposed to failure when their investment portfolios were shaken by large losses.

CRYPTOCURRENCIES

We are all accustomed to financial transactions that are recorded in a centralized "ledger." For example, your credit card company maintains a record, or database, of all of the purchases and payments you make through its network. Your bank maintains a ledger of deposits and withdrawals. Stock exchanges maintain a ledger of who has bought and sold stocks. These ledgers are centralized in the sense that they are administered by a particular trusted party running and hosting the database. By their nature, they do not allow for anonymity, and they can be targets of hackers. This is why the administrator must be trusted—in terms of both honesty and efficiency.

In contrast, cryptocurrencies, for example bitcoin or ethereum, use a *distributed ledger,* meaning that the record of transactions is distributed over a network of connected computers. No single administrator controls it, so there is no single target for potential hackers to attack. Instead, the network sets up a protocol by which new transactions can be securely added to a public ledger. The identities of each party to the transaction can be masked, allowing for full anonymity. The ledger is essentially a list of transactions recorded in a "blockchain," and each transaction results in a time-stamped update to the block. Each participant in the network has access to a complete copy of the ledger. Distributing the blockchain across a dispersed network makes it harder for any hacker to attack its integrity. When the ledger is public, it is difficult to either bypass or manipulate the historical record of agreed-to transactions, and crucially, there is no need for the trusted administrator that lies at the heart of a centralized ledger.

Blockchain technology can be applied far more widely than just cryptocurrency, but it is ideally suited for secure digital transactions. Bitcoin was introduced in 2009, but it has since been joined by many other digital currencies; in 2018, there were approximately 1,600 different cryptocurrencies, but most are far smaller (in terms of total outstanding value) than bitcoin or ethereum.

Digital currency's promise as an alternative to traditional currencies and payment systems still remains unclear. One challenge is price volatility, making it a problematic store of value. In 2018, the dollar value of one bitcoin ranged from almost $20,000 to less than $3,200. Another is that transactions require enormous amounts of costly energy for the computers that validate those transactions. Moreover, the rate at which transactions can be validated remains miniscule compared to that offered by the traditional credit card network. These problems limit the efficacy of cryptocurrency as a means of exchange. Finally, governments concerned about the use of anonymous transactions to either avoid taxes or facilitate trade in illegal items have begun to demonstrate greater interest in regulation of these markets. Notwithstanding these challenges, the technology is still new, and enthusiasts predict it will upend today's financial landscape.

A variation on cryptocurrency is the digital token issued in an *initial coin offering,* or *ICO.* The ICO is a source of crowdfunding in which start-up firms raise cash by selling digital tokens. The token is a form of cryptocurrency that can eventually be used to purchase products or services from the start-up. However, once issued, the coins can be bought or sold among investors like other digital currencies, thus allowing for speculation on their value. Given this potential, some have argued that these coins are in fact securities issued by the firm, and thus should be subject to SEC regulation. Some countries, for example, China and South Korea, have banned ICOs altogether. It seems safe to predict that the legal status of these coins will evolve considerably in coming years.

While large firms can raise funds directly from the stock and bond markets with help from their investment bankers, smaller and younger firms that have not yet issued securities to the public do not have that option. Start-up companies rely instead on bank loans and investors who are willing to invest in them in return for an ownership stake in the firm. The equity investment in these young companies is called Sources of venture capital include dedicated venture capital funds, wealthy individuals known as *angel investors,* and institutions such as pension funds.

Money invested to finance a new, privately held firm.

Most venture capital funds are set up as limited partnerships. A management company starts with its own money and raises additional capital from limited partners such as pension funds. That capital may then be invested in a variety of start-up companies. The management company usually sits on the start-up company's board of directors, helps recruit senior managers, and provides business advice. It charges a fee to the VC fund for overseeing the investments. After some period of time, for example, 10 years, the fund is liquidated and proceeds are distributed to the investors.

Venture capital investors commonly take an active role in the management of a start-up firm. Other active investors may engage in similar hands-on management but focus instead on firms that are in distress or firms that may be bought up, "improved," and sold for a profit. Collectively, these investments in firms that do not trade on public stock exchanges are known as investments.

Investments in companies whose shares are not traded in public stock markets.

Surveying the major actors on the financial scene highlighted in this section, it is clear that when the needs of market participants create profit opportunities, markets tend to provide those desired services. Sometimes, those innovations are spurred by technological advances that make possible previously infeasible products. *Fintech* is the application of technology to financial markets, and it has changed many aspects of the financial landscape.

While we have focused on financial intermediaries, technology that allows individuals to interact directly has been the source of some financial *disintermediation.* For example, *peer-to-peer lending* is one example of a technology that can be used to link lenders and borrowers directly, without need of an intermediary like a commercial bank. One of the major players in this market is LendingClub, whose website allows borrowers to apply for personal loans up to $40,000 or business loans up to $300,000. The potential borrower is given a credit score, and then lenders (which the company calls investors) can decide whether to participate in the loan. LendingClub does not itself lend funds; instead, its platform provides information about borrowers and lenders and allows them to interact directly.

Cryptocurrencies provide another example of technology challenging conventional centralized financial networks. Cryptocurrencies such as bitcoin or ethereum allow for payment systems that bypass traditional channels such as credit cards, debit cards, or checks. The *blockchain* technology used by these currencies can, in principle, offer greater security and anonymity for financial transactions. These payment and record-keeping systems may therefore become a larger part of the financial landscape in years to come. The nearby box further discusses cryptocurrencies and blockchain technology.

1.7 THE FINANCIAL CRISIS OF 2008–2009

This chapter has laid out the broad outlines of the financial system, as well as some of the links between the financial side of the economy and the "real" side, in which goods and services are produced. The financial crisis illustrated in a painful way the intimate ties between these two sectors. We present in this section a capsule summary of the crisis, attempting to draw some lessons about the role of the financial system as well as the causes and consequences of what has become known as *systemic risk*. Some of these issues are complicated; we consider them briefly here but will return to them in greater detail later in the text once we have more context for analysis.

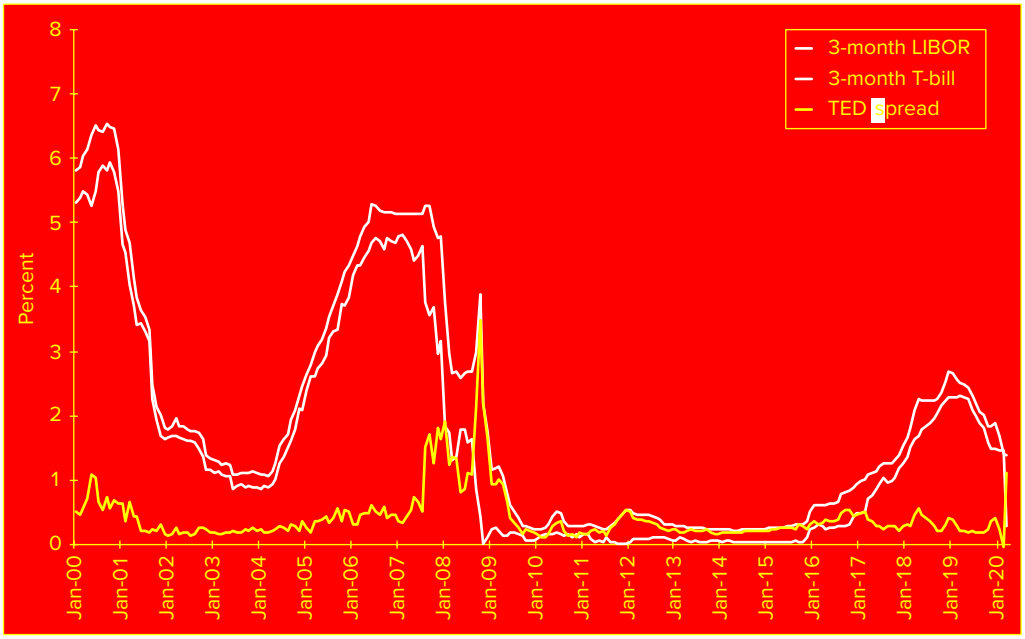
In early 2007, most observers thought it inconceivable that within two years the world financial system would be facing its worse crisis since the Great Depression. At the time, the economy seemed to be marching from strength to strength. The last significant macroeconomic threat had been from the collapse of the high-tech bubble in 2000–2002. But the Federal Reserve responded to an emerging recession by aggressively reducing interest rates. Figure 1.1 shows that Treasury bill rates dropped drastically between 2001 and 2004, and the LIBOR rate (LIBOR is an acronym for the London Interbank Offer Rate), which is the interest rate at which major money-center banks lend to each other, fell in tandem.[5] These actions appeared to have been successful, and the recession was short-lived and mild.

By mid-decade the economy was once again apparently healthy. While the stock market had declined substantially between 2001 and 2002, Figure 1.2 shows that it reversed direction just as dramatically beginning in 2003, fully recovering all of its post-tech-meltdown losses within a few years. Of equal importance, the banking sector seemed healthy. The spread between the LIBOR rate (at which banks borrow from each other) and the Treasury bill rate

[5] The London Interbank Offer Rate is a rate charged in an interbank lending market outside the U.S. (as of 2019, largely centered in London). The rate is typically quoted for three-month loans.

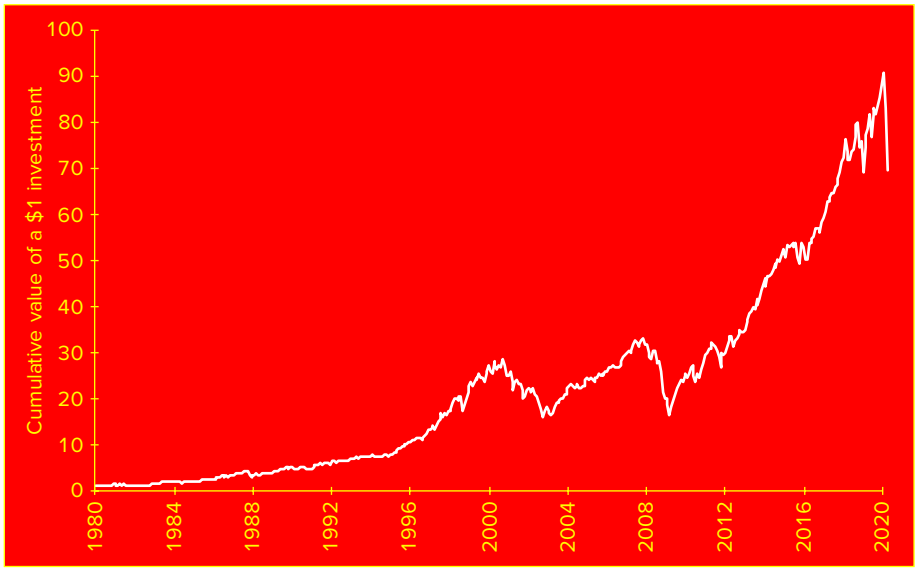
1.1

Short-term LIBOR and Treasury bill rates and the TED spread



1.2

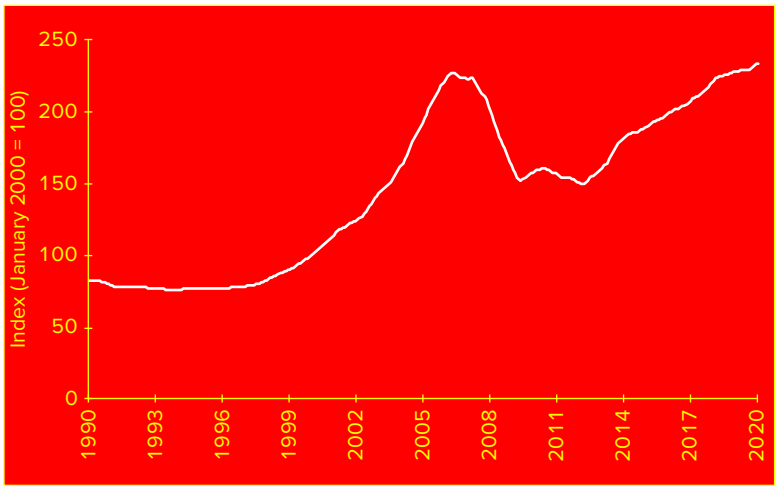
Cumulative value of a $1 investment in the S&P 500 Index



(at which the U.S. government borrows), a common measure of credit risk in the banking sector (often referred to as the *TED spread*),[6] was only around 0.25% in early 2007 (see the blue line in Figure 1.1), suggesting that fears of default or "counterparty" risk in the banking sector were extremely low.

The combination of dramatically reduced interest rates and an apparently stable economy fed a historic boom in the housing market. Figure 1.3 shows that U.S. housing prices began rising noticeably in the late 1990s and accelerated dramatically after 2001 as interest rates plummeted. In the 10 years beginning 1997, average prices in the U.S. approximately tripled.

[6] *TED* stands for "Treasury-Eurodollar spread." The Eurodollar rate in this spread is, in fact, LIBOR.



1.3

The Case-Shiller index of U.S. housing prices (10-city index)

But confidence in the power of macroeconomic policy to reduce risk, the impressive recovery of the economy from the high-tech implosion, and particularly the housing price boom following the aggressive reduction in interest rates may have sown the seeds for the debacle that played out in 2008. On the one hand, the Fed's policy of reducing interest rates had resulted in low yields on a wide variety of investments, and investors were hungry for higher-yielding alternatives. On the other hand, low volatility and optimism about macroeconomic prospects encouraged greater tolerance for risk in the search for these higher-yielding investments. Nowhere was this more evident than in the exploding market for securitized mortgages.

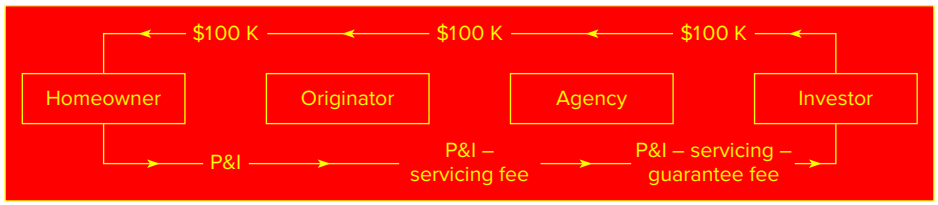
Prior to 1970, most mortgage loans would come from a local lender such as a neighborhood savings bank or credit union. A homeowner would borrow funds for a home purchase and repay it over a long period, commonly 30 years. A typical thrift institution would have as its major asset a portfolio of these long-term home loans, while its major liability would be the accounts of its depositors. This landscape began to change in the 1970s when Fannie Mae (FNMA, or Federal National Mortgage Association) and Freddie Mac (FHLMC, or Federal Home Loan Mortgage Corporation) began buying large quantities of mortgage loans from originators and bundling them into pools that could be traded like any other financial asset. These pools, which were essentially claims on the underlying mortgages, were soon dubbed "mortgage-backed securities," and the process was called Fannie and Freddie quickly became the behemoths of the mortgage market, between them buying more than half of all mortgages originated by the private sector.

Pooling loans into standardized securities backed by those loans, which can then be traded like any other security.

Figure 1.4 illustrates how cash flows passed from the original borrower to the ultimate investor in a mortgage-backed security. The loan originator, for example, the savings and loan, might make a $100,000 loan to a homeowner. The homeowner would repay principal and interest (P&I) on the loan over 30 years. But then the originator would sell the mortgage to Freddie Mac or Fannie Mae and recover the cost of the loan. The originator could continue to service the loan (i.e., collect the monthly payments from the homeowner) for a small servicing fee, but the loan payments net of that fee would be passed along to the agency. In turn, Freddie or Fannie would pool the loans into mortgage-backed securities and sell the securities to investors such as pension funds or mutual funds. The agency (Fannie or Freddie) typically would guarantee the credit or default risk of the loans included in each pool, for which it would retain a guarantee fee before passing along the rest of the cash flow to the ultimate investor. Because the mortgage cash flows were passed along from the homeowner to the

1.4

Cash flows in a mortgage pass-through security



lender, to Fannie or Freddie, and finally to the investor, the mortgage-backed securities were also called *pass-throughs*.

Until the last decade, the vast majority of the mortgages that had been securitized into pass-throughs were held or guaranteed by Freddie Mac or Fannie Mae. These were low-risk *conforming* mortgages, meaning that eligible loans for agency securitization couldn't be too big and homeowners had to meet underwriting criteria establishing their ability to repay the loan. For example, the ratio of loan amount to house value could be no more than 80%.

Conforming loans were pooled almost entirely through Freddie Mac and Fannie Mae, but once the securitization model took hold, it created an opening for a new product: securitization by private firms of *nonconforming* "subprime" loans with higher default risk. One important difference between the government-agency pass-throughs and these so-called private-label pass-throughs was that the investor in the private-label pool would bear the risk that homeowners might default on their loans. Thus, originating mortgage brokers had little incentive to perform due diligence on the loan *as long as the loans could be sold to an investor.* These investors, of course, had no direct contact with the borrowers and could not perform detailed underwriting concerning loan quality. Instead, they relied on borrowers' credit scores, which steadily came to replace conventional underwriting.

A strong trend toward low-documentation and then no-documentation loans entailing little verification of a borrower's ability to carry a loan soon emerged. Other subprime underwriting standards also quickly deteriorated. For example, allowed leverage on home loans (as measured by the loan-to-value ratio) rose dramatically. When housing prices began falling, these highly leveraged loans were quickly "underwater," meaning that the house was worth less than the loan balance, and many homeowners decided to "walk away" or abandon their homes—and their loans.

Adjustable rate mortgages (ARMs) also grew in popularity, quickly becoming the standard in the subprime market. These loans offered borrowers low initial or "teaser" interest rates, but these rates eventually would reset to current market interest yields, for example, the Treasury bill rate plus 3%. While many of these borrowers had "maxed out" their borrowing capacity at the teaser rate, as soon as the loan rate was reset, their monthly payments would soar, especially if market interest rates had increased.

Despite these obvious risks, the ongoing increase in housing prices over the last decade seemed to have lulled many investors into complacency, with a widespread belief that continually rising home prices would bail out poorly performing loans. But starting in 2004, the ability of refinancing to save a loan began to diminish. First, higher interest rates put payment pressure on homeowners who had taken out adjustable rate mortgages. Second, as Figure 1.3 shows, housing prices peaked by 2006, so homeowners' ability to refinance a loan using built-up equity in the house declined. Mortgage default rates began to surge in 2007, as did losses on mortgage-backed securities. The crisis was ready to shift into high gear.

One might ask: Who was willing to buy all of these risky subprime mortgages? Securitization, restructuring, and credit enhancement provide a big part of the answer. New risk-shifting tools enabled investment banks to carve out AAA-rated securities from original-issue "junk" loans. Collateralized debt obligations, or CDOs, were among the most important and eventually damaging of these innovations.

CDOs were designed to concentrate the credit (i.e., default) risk of a bundle of loans on one class of investors, leaving the other investors in the pool relatively protected from that risk. The idea was to prioritize claims on loan repayments by dividing the pool into senior versus junior slices called *tranches*. The senior tranches had first claim on repayments from the entire pool. Junior tranches would be paid only after the senior ones had received their cut. For example, if a pool was divided into two tranches, with 70% of the pool allocated to the senior tranche and 30% allocated to the junior one, the senior investors would be repaid in full as long as 70% or more of the loans in the pool performed, that is, as long as the default rate on the pool remained below 30%. Even with pools composed of risky subprime loans, default rates above 30% seemed extremely unlikely, and thus senior tranches were commonly granted the highest (i.e., AAA) rating by the major credit rating agencies, Moody's, Standard & Poor's, and Fitch. Large amounts of AAA-rated securities were thus carved out of pools of low-rated mortgages.

Of course, we know now that these ratings were wrong. The senior-subordinated structure of CDOs provided less protection to senior tranches than investors anticipated. When housing prices across the entire country began to fall in unison, defaults in all regions increased and the hoped-for benefits from diversifying loans geographically never materialized.

Why had the rating agencies so dramatically underestimated credit risk in these subprime securities? First, default probabilities had been estimated using historical data from an unrepresentative period characterized by a housing boom and an uncommonly prosperous economy. Moreover, the ratings analysts had extrapolated historical default experience to a new sort of borrower pool—one without down payments, with exploding payment loans, and with low- or no-documentation loans (sometimes dubbed *liar loans*). Past default experience was largely irrelevant given these profound changes in the market. Moreover, there was excessive optimism about the power of cross-regional diversification to minimize risk.

CONCEPT check

When Freddie Mac and Fannie Mae pooled conforming mortgages into securities, they guaranteed the underlying mortgage loans against homeowner defaults. In contrast, there were no guarantees on the mortgages pooled into subprime mortgage–backed securities, so investors bore the exposure to credit risk. Were either of these arrangements necessarily a better way to manage and allocate default risk?

In parallel to the CDO market, the market in *credit default swaps* also exploded in this period. A credit default swap, or CDS, is in essence an insurance contract against the default of one or more borrowers. (We will describe these in more detail in Chapter 10.) The purchaser of the swap pays an annual premium (like an insurance premium) for the protection from credit risk. Credit default swaps became an alternative method of credit enhancement, seemingly allowing investors to buy subprime loans and insure their investments. But, in practice, some swap issuers ramped up their exposure to credit risk to unsupportable levels, without sufficient capital to back those obligations. For example, the large insurance company AIG alone sold more than $400 billion of CDS contracts on subprime mortgages.

By 2007, the financial system displayed several troubling features. Many large banks and related financial institutions had adopted an apparently profitable financing scheme: borrowing short term at low interest rates to finance holdings in higher-yielding, long-term, illiquid[7] assets. But this business model was precarious: By relying primarily on short-term loans for

[7] *Liquidity* refers to the speed and the ease with which investors can realize the cash value of an investment. Illiquid assets, for example, real estate, can be hard to sell quickly, and a quick sale may require a substantial discount from the price at which the asset could be sold in an unrushed situation.

their funding, these firms needed to constantly refinance their positions (i.e., borrow additional funds as the loans matured), or else face the necessity of quickly selling off their less-liquid asset portfolios, which would be difficult in times of financial stress. Moreover, these institutions were highly leveraged and had little capital as a buffer against losses. Even small portfolio losses could drive their net worth negative, at which point no one would be willing to extend them loans.

Another source of fragility was widespread investor reliance on credit protection through products like CDOs. Many of the assets underlying these pools were illiquid, hard to value, and highly dependent on forecasts of future performance of other loans. In a widespread downturn, with rating downgrades, these assets would prove difficult to sell.

Risk of breakdown in the financial system, particularly due to spillover effects from one market into others.

This new financial model was brimming with a potential breakdown of the financial system when problems in one market spill over and disrupt others. When lenders such as banks have limited capital, and are afraid of further losses, they may rationally choose to hoard their capital instead of lending it out to customers such as small firms, thereby exacerbating funding problems for their customary borrowers.

By fall of 2007, housing prices were in decline (Figure 1.3), mortgage delinquencies increased, and the stock market entered its own free fall (Figure 1.2). Many investment banks, which had large investments in mortgages, also began to totter.

The crisis peaked in September 2008. On September 7, the giant federal mortgage agencies Fannie Mae and Freddie Mac, both of which had taken large positions in subprime mortgage–backed securities, were put into conservatorship. (We will have more to say on their travails in Chapter 2.) The failure of these two mainstays of the U.S. housing and mortgage finance industries threw financial markets into a panic. By the second week of September, it was clear that both Lehman Brothers and Merrill Lynch were on the verge of bankruptcy. On September 14, Merrill Lynch was sold to Bank of America. The next day, Lehman Brothers, which was denied equivalent treatment, filed for bankruptcy protection. Two days later, on September 17, the government reluctantly lent $85 billion to AIG, reasoning that its failure would have been highly destabilizing to the banking industry, which was holding massive amounts of its credit guarantees (i.e., CDS contracts). The next day, the Treasury unveiled its first proposal to spend $700 billion to purchase "toxic" mortgage-backed securities.

A particularly devastating fallout of the Lehman bankruptcy was on the "money market" for short-term lending. Lehman had borrowed considerable funds by issuing very short-term unsecured debt called *commercial paper*. Among the major customers in the commercial paper were money market mutual funds, which invest in short-term, high-quality debt of commercial borrowers. When Lehman faltered, fear spread that these funds were exposed to losses on their large investments in commercial paper, and money market fund customers across the country rushed to withdraw their funds. In turn, the funds rushed out of commercial paper into safer and more liquid Treasury bills, essentially shutting down short-term financing markets.

The freezing up of credit markets was the end of any dwindling possibility that the financial crisis could be contained to Wall Street. Larger companies that had relied on the commercial paper market were now unable to raise short-term funds. Banks similarly found it difficult to raise funds. (Look back to Figure 1.1, where you will see that the TED spread, a measure of bank insolvency fears, skyrocketed in 2008.) With banks unwilling or unable to extend credit to their customers, thousands of small businesses that relied on bank lines of credit also became unable to finance their normal business operations. Capital-starved companies were forced to scale back their own operations precipitously. The unemployment rate rose rapidly, and the economy was in its worst recession in decades. The turmoil in the financial markets had spilled over into the real economy, and Main Street had joined Wall Street in a bout of protracted misery.

The crisis was not limited to the United States. Housing markets throughout the world fell and many European banks had to be rescued by their governments, which were themselves

heavily in debt. As the cost of the bank bailouts mounted, the ability of these governments to repay their own debts came into doubt. In this way, the banking crisis spiraled into a sovereign debt crisis.

Greece was the hardest hit. Its government debt of about $460 billion was considerably more than its annual GDP. In 2011 it defaulted on debts totaling around $130 billion, eventually requiring a series of rescue packages from the European Union, the European Central Bank, and the International Monetary Fund.

The crisis engendered many calls for reform of Wall Street. These eventually led to the passage in 2010 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, which contains several mechanisms to mitigate systemic risk.

The act calls for stricter rules for bank capital, liquidity, and risk management practices, especially as banks become larger and their potential failure would be more threatening to other institutions. With more capital supporting banks, the potential for one insolvency to trigger another could be contained. In fact, bank capital levels are higher today than they were before the crisis.

In a related measure, the act requires large banks to undergo annual stress tests, which simulate whether the bank has enough capital to withstand specific episodes of economic duress, for example, a major recession, a large increase in interest rates, or a severe decline in liquidity. So far, additional required capital as well as more conservative lending and investing practices have resulted in improved risk exposure.

Dodd-Frank also attempts to limit the risky activities in which banks can engage. The so-called Volcker Rule, named after former chairman of the Federal Reserve Paul Volcker, limits a bank's ability to trade for its own account and to own or invest in a hedge fund or private equity fund.

The incentives of the bond rating agencies are also a sore point. Few are happy with a system that has the ratings agencies paid by the firms they rate. The act creates an Office of Credit Ratings within the Securities and Exchange Commission to oversee the credit rating agencies.

Recent legislation has resulted in a partial rollback of the Dodd-Frank Act. In 2018 Congress passed the Economic Growth, Regulatory Relief and Consumer Protection Act, exempting most small to medium-sized banks from Dodd-Frank rules, including stress tests. Some large banks (but not the largest) are no longer deemed "systemically important," which would bring about closer oversight and higher capital requirements. The 2018 bill also exempts smaller banks from the Volcker Rule. Dodd-Frank remains under attack by some members of Congress, and future pullbacks are certainly possible. Regardless of these possible revisions, the crisis surely made clear the essential role of the financial system in the functioning of the real economy.

1.8 OUTLINE OF THE TEXT

The text has six parts, which are fairly independent and may be studied in a variety of sequences. Part One is an introduction to financial markets, instruments, and trading of securities. This part also describes the mutual fund industry.

Part Two is a fairly detailed presentation of "modern portfolio theory." This part of the text treats the effect of diversification on portfolio risk, the efficient diversification of investor portfolios, the choice of portfolios that strike an attractive balance between risk and return, and the trade-off between risk and expected return. This part also treats the efficient market hypothesis as well as behavioral critiques of theories based on investor rationality.

Parts Three through Five cover security analysis and valuation. Part Three is devoted to debt markets and Part Four to equity markets. Part Five covers derivative assets, such as options and futures contracts.

Part Six is an introduction to active investment management. It shows how different investors' objectives and constraints can lead to a variety of investment policies. This part discusses the role of investment management in nearly efficient markets, considers how one should evaluate the performance of managers who pursue active strategies, and takes a close look at hedge funds. It also shows how the principles of portfolio construction can be extended to the international setting.

SUMMARY

- Real assets create wealth. Financial assets represent claims to parts or all of that wealth. Financial assets determine how the ownership of real assets is distributed among investors.
- Financial assets can be categorized as fixed-income (debt), equity, or derivative instruments. Top-down portfolio construction techniques start with the asset allocation decision—the allocation of funds across broad asset classes—and then progress to more specific security-selection decisions.
- Competition in financial markets leads to a risk-return trade-off, in which securities that offer higher expected rates of return also impose greater risks on investors. The presence of risk, however, implies that actual returns can differ considerably from expected returns at the beginning of the investment period. Competition among security analysts also results in financial markets that are nearly informationally efficient, meaning that prices reflect all available information concerning the value of the security. Passive investment strategies may make sense in nearly efficient markets.
- Financial intermediaries pool investor funds and invest them. Their services are in demand because small investors cannot efficiently gather information, diversify, and monitor portfolios. The financial intermediary, in contrast, is a large investor that can take advantage of scale economies.
- Investment banking brings efficiency to corporate fund raising. Investment bankers develop expertise in pricing new issues and in marketing them to investors. By the end of 2008, all the major stand-alone U.S. investment banks had been absorbed into or had reorganized themselves into bank holding companies. In Europe, where universal banking had never been prohibited, large banks had long maintained both commercial and investment banking divisions.
- The financial crisis of 2008 demonstrated the links between the real and the financial sides of the economy and the importance of systemic risk. Systemic risk can be limited by transparency that allows traders and investors to assess the risk of their counterparties, capital requirements to prevent trading participants from being brought down by potential losses, frequent settlement of gains or losses to prevent losses from accumulating beyond an institution's ability to bear them, incentives to discourage excessive risk taking, and accurate and unbiased analysis by those charged with evaluating security risk.

KEY TERMS

active management, 12
agency problems, 8
asset allocation, 10
derivative securities, 5
equity, 5
financial assets, 3
financial intermediaries, 13
fixed-income (debt) securities, 5
investment, 2
investment bankers, 15
investment companies, 14
passive management, 12
primary market, 15
private equity, 16
real assets, 3
risk-return trade-off, 11
secondary market, 15
securitization, 19
security analysis, 10
security selection, 10
systemic risk, 22
venture capital (VC), 16

PROBLEM SETS

Select problems are available in McGraw-Hill's Connect. Please see the Supplements section of the book's frontmatter for more information.

1. What are the differences between equity and fixed-income securities? *(LO 1-5)*
2. What is the difference between a primary asset and a derivative asset? *(LO 1-1)*
3. What is the difference between asset allocation and security selection? *(LO 1-4)*
4. What are agency problems? What are some approaches to solving them? *(LO 1-3)*
5. What are the differences between real and financial assets? *(LO 1-2)*
6. How does investment banking differ from commercial banking? *(LO 1-5)*
7. For each transaction, identify the real and/or financial assets that trade hands. Are any financial assets created or destroyed in the transaction? *(LO 1-2)*
   a. Toyota takes out a bank loan to finance the construction of a new factory.
   b. Toyota pays off its loan.
   c. Toyota uses $10 million of cash on hand to purchase additional inventory of spare auto parts.
8. Suppose that in a wave of pessimism, housing prices fall by 10% across the entire economy. *(LO 1-2)*
   a. Has the stock of real assets of the economy changed?
   b. Are individuals less wealthy?
   c. Can you reconcile your answers to (*a*) and (*b*)?
9. Lanni Products is a start-up computer software development firm. It currently owns computer equipment worth $30,000 and has cash on hand of $20,000 contributed by Lanni's owners. For each of the following transactions, identify the real and/or financial assets that trade hands. Are any financial assets created or destroyed in the transaction? *(LO 1-2)*
   a. Lanni takes out a bank loan. It receives $50,000 in cash and signs a note promising to pay back the loan over three years.
   b. Lanni uses the cash from the bank plus $20,000 of its own funds to finance the development of new financial planning software.
   c. Lanni sells the software product to Microsoft, which will market it to the public under the Microsoft name. Lanni accepts payment in the form of 1,000 shares of Microsoft stock.
   d. Lanni sells the shares of stock for $140 per share and uses part of the proceeds to pay off the bank loan.
10. Reconsider Lanni Products from Problem 9. *(LO 1-2)*
    a. Prepare its balance sheet just after it gets the bank loan. What is the ratio of real assets to total assets?
    b. Prepare the balance sheet after Lanni spends the $70,000 to develop its software product. What is the ratio of real assets to total assets?
    c. Prepare the balance sheet after Lanni accepts the payment of shares from Microsoft. What is the ratio of real assets to total assets?
11. What reforms to the financial system might reduce its exposure to systemic risk? *(LO 1-6)*
12. Examine the balance sheet of commercial banks in Table 1.3. *(LO 1-2)*
    a. What is the ratio of real assets to total assets?
    b. What is that ratio for nonfinancial firms (Table 1.4)?
    c. Why should this difference be expected?
13. Why do financial assets show up as a component of household wealth, but not of national wealth? Why do financial assets still matter for the material well-being of an economy? *(LO 1-2)*

14. Discuss the advantages and disadvantages of the following forms of managerial compensation in terms of mitigating agency problems, that is, potential conflicts of interest between managers and shareholders. *(LO 1-3)*
    a. A fixed salary.
    b. Stock in the firm that must be held for five years.
    c. A salary linked to the firm's profits.
15. Oversight by large institutional investors or creditors is one mechanism to reduce agency problems. Why don't individual investors in the firm have the same incentive to keep an eye on management? *(LO 1-3)*
16. Wall Street firms have traditionally compensated their traders with a share of the trading profits they generated. How might this practice have affected traders' willingness to assume risk? What agency problem can this practice can engender? *(LO 1-3)*
17. Why would you expect securitization to take place only in highly developed capital markets? *(LO 1-6)*
18. What would you expect to be the relationship between securitization and the role of financial intermediaries in the economy? For example, what happens to the role of local banks in providing capital for mortgage loans when national markets in mortgage-backed securities become highly developed? *(LO 1-6)*
19. Give an example of three financial intermediaries, and explain how they act as a bridge between small investors and large capital markets or corporations. *(LO 1-5)*
20. Firms raise capital from investors by issuing shares in the primary markets. Does this imply that corporate financial managers can ignore trading of previously issued shares in the secondary market? *(LO 1-4)*
21. The average rate of return on investments in large stocks has outpaced that on investments in Treasury bills by about 8% since 1926. Why, then, does anyone invest in Treasury bills? *(LO 1-1)*
22. You see an advertisement for a book that claims to show how you can make $1 million with no risk and with no money down. Will you buy the book? *(LO 1-1)*

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1. Log on to **finance.yahoo.com** and enter the ticker symbol "RRD" in the *Quote Lookup* box to find information about R.R. Donnelley & Sons.
    a. Click on company *Profile*. What is Donnelly's main line of business?
    b. Now go to *Statistics*. How many shares of the company's stock are outstanding? What is the total market value of the firm? What were its profits in the most recent fiscal year?
    c. Look up the major *Holders* of the company's stock. What fraction of total shares is held by insiders?
    d. Now go to *Analysis*. What is the average estimate for next quarter's earnings per share of the analysts covering this firm? How does that compare to the current quarter's earnings?
    e. Look at the company's balance sheet under the *Financials* tab. What were its total assets at the end of the most recent fiscal year?
2. Visit the website of the Securities and Exchange Commission, **www.sec.gov**. What is the mission of the SEC? What information and advice does the SEC offer to beginning investors?
3. Now visit the website of FINRA (the Financial Industry Regulatory Authority) at **www.finra.org**. What is its mission? What information and advice does it offer to beginners?
4. Now visit the website of the IOSCO, **www.iosco.org**. What is its mission? What information and advice does it offer to beginners?

CONCEPT checks

1.1 *a.* Real
b. Financial
c. Real
d. Real
e. Financial

1.2 The central issue is the incentive and ability to monitor the quality of loans both when originated and over time. Freddie and Fannie clearly had incentive to monitor the quality of conforming loans that they had guaranteed, and their ongoing relationships with mortgage originators gave them opportunities to evaluate track records over extended periods of time. In the subprime mortgage market, the ultimate investors in the securities (or the CDOs backed by those securities), who were bearing the credit risk, should not have been willing to invest in loans with a disproportional likelihood of default. If they properly understood their exposure to default risk, then the (correspondingly low) prices they would have been willing to pay for these securities would have imposed discipline on the mortgage originators and servicers. The fact that they were willing to hold such large positions in these risky securities suggests that they did not appreciate the extent of their exposure. Maybe they were led astray by overly optimistic projections for housing prices or by biased assessments from the credit reporting agencies. While in principle either arrangement for default risk could have provided the appropriate discipline on the mortgage originators, in practice the informational advantages of Freddie and Fannie probably made them the better "recipients" of default risk. The lesson is that information and transparency are some of the preconditions for well-functioning markets.

Chapter

2

LO 2-1 Describe the differences among the major assets that trade in money markets and in capital markets.

LO 2-2 Describe the construction of stock market indexes.

LO 2-3 Calculate the profit or loss on investments in options and futures contracts.

You learned in Chapter 1 that the process of building an investment portfolio usually begins by deciding how much money to allocate to broad classes of assets, such as safe money market securities or bank accounts, longer-term bonds, stocks, or even asset classes such as real estate or precious metals. This process is called *asset allocation*. Within each class, the investor then selects specific assets from a more detailed menu. This is called *security selection*.

Each broad asset class contains many specific security types, and the many variations on a theme can be overwhelming. Our goal in this chapter is to introduce you to the important features of broad classes of securities. Toward this end, we organize our tour of financial instruments according to asset class.

Financial markets are traditionally segmented into money markets and capital markets. Money market instruments include short-term, marketable, liquid, low-risk debt securities. Money market instruments sometimes are called *cash equivalents,* or just *cash* for short. Capital markets, in contrast, include longer-term and riskier securities. Securities in the capital market are much more diverse than those found within the money market. For this reason, we will subdivide the capital market into three segments: longer-term debt markets, equity markets, and derivative markets in which options and futures trade.

We first describe money market instruments. We then move on to debt and equity securities. We explain the structure of various stock market indexes in this chapter because market benchmark portfolios play an important role in portfolio construction and evaluation. Finally, we survey derivative security markets for options, futures, and swaps contracts. A selection of the markets, instruments, and indexes covered in this chapter appears in Table 2.1.