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# Essentials of Investments

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# Essentials *of* Investments

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Twelfth Edition

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## ESSENTIALS OF INVESTMENTS

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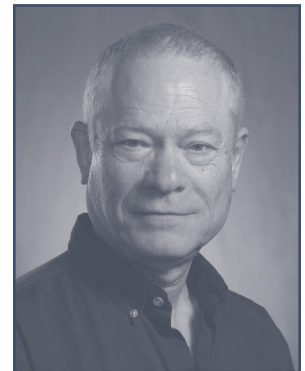


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# Organization of the Twelfth Edition

**Essentials of Investments**, 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.

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.

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.

Includes coverage of innovations in exchange-traded funds.

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

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

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

Includes single-factor as well as multifactor models.

Considers evidence both supporting and refuting efficient markets.

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

## Part ONE

### ELEMENTS OF INVESTMENTS 1

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- 1 Investments: Background and Issues 2
- 2 Asset Classes and Financial Instruments 28
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### PORTFOLIO THEORY 111

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- 5 Risk, Return, and the Historical Record 112
- 6 Efficient Diversification 147
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- 8 The Efficient Market Hypothesis 226
- 9 Behavioral Finance and Technical Analysis 258

**Part THREE**

**DEBT SECURITIES 283**

**10** Bond Prices and Yields 284

**11** Managing Bond Portfolios 328

This is the first of three parts on security valuation.

Includes material on sovereign credit default swaps.

Contains spreadsheet material on duration and convexity.

This part is presented in a “top-down” manner, starting with the broad macroeconomic environment before moving to more specific analysis.

**Part FOUR**

**SECURITY ANALYSIS 363**

**12** Macroeconomic and Industry Analysis 364

**13** Equity Valuation 395

**14** Financial Statement Analysis 436

Discusses how international political developments such as the sovereign debt crisis can have major impacts on economic prospects.

Contains free cash flow equity valuation models as well as a discussion of the pitfalls of discounted cash flow models.

Includes a top-down rationale for how ratio analysis can be organized to guide one’s analysis of firm performance.

**Part FIVE**

**DERIVATIVE MARKETS 475**

**15** Options Markets 476

**16** Option Valuation 509

**17** Futures Markets and Risk Management 547

This part highlights how these markets have become crucial and integral to the financial universe and are major sources of innovation.

Offers thorough introduction to option payoffs, strategies, and securities with embedded options.

Includes an introduction to risk-neutral valuation methods and their implementation in the binomial option-pricing model.

**Part SIX**

**ACTIVE INVESTMENT MANAGEMENT 581**

**18** Evaluating Investment Performance 582

**19** International Diversification 619

**20** Hedge Funds 646

**21** Taxes, Inflation, and Investment Strategy 670

**22** Investors and the Investment Process 689

This part unifies material on active management and is ideal for a closing-semester unit on applying theory to actual portfolio management.

Rigorous development of performance evaluation methods.

Provides evidence on political risk as well as the benefits of international diversification.

Updated assessment of hedge fund performance and the exposure of hedge funds to “black swans.”

Employs extensive spreadsheet analysis of the interaction of taxes and inflation on long-term financial strategies.

Modeled after the CFA Institute curriculum, also includes guidelines on “How to Become a Chartered Financial Analyst.”

# Pedagogical Features

## Learning Objectives

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.

## Learning Objectives

- LO 8-1 Demonstrate why security price changes should be essentially unpredictable in an efficient market.
- LO 8-2 Cite evidence that supports and contradicts the efficient market hypothesis.
- LO 8-3 Provide interpretations of various stock market “anomalies.”
- LO 8-4 Formulate investment strategies that make sense in informationally efficient markets.

## Chapter Overview

Each chapter begins with a brief narrative to explain the concepts that will be covered in more depth. Relevant websites 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.

**T**his chapter will provide you with a broad introduction to the many venues and procedures available for trading securities. We will see that trading mechanisms range from direct negotiation among market participants to fully automated computer crossing of trade orders.

The first time a security trades is when it is issued to the public. Therefore, we begin with a look at how securities are first marketed to the public by investment bankers, the midwives of securities. We turn next to a broad survey of how already-issued securities may be traded among investors, focusing on the differences between dealer markets, electronic markets,

and formal stock exchanges. With this background, we then turn to specific trading arenas such as the New York Stock Exchange, NASDAQ, and several all-electronic markets. We compare the mechanics of trade execution and the impact of cross-market integration of trading.

We then turn to the essentials of some specific types of transactions, such as buying on margin and short-selling stocks. We close the chapter with a look at some important aspects of the regulations governing security trading, including insider trading laws, circuit breakers, and the role of security markets as self-regulating organizations.

## Key Terms in the Margin

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.

### index model

Model that relates stock returns to returns on both a broad market index and firm-specific factors.

## 6.5 A SINGLE-INDEX STOCK MARKET

We started this chapter with the distinction between systematic and firm-specific risk. Systematic risk is macroeconomic, affecting all securities, while firm-specific risk factors affect only one particular firm or, at most, a cluster of firms. **Index models** are statistical models designed to estimate these two components of risk for a particular security or portfolio.

## Numbered Equations

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.

be necessary to provide an after-tax return equal to that of municipals. To derive this value, we set after-tax yields equal and solve for the *equivalent taxable yield* of the tax-exempt bond. This is the rate a taxable bond would need to offer in order to match the after-tax yield on the tax-free municipal.

$$r_{\text{taxable}}(1 - t) = r_{\text{muni}} \quad (2.1)$$

or

$$r_{\text{taxable}} = \frac{r_{\text{muni}}}{1 - t} \quad (2.2)$$

Thus, the equivalent taxable yield is simply the tax-free rate divided by  $1 - t$ . Table 2.2 presents equivalent taxable yields for several municipal yields and tax rates.

## On the MARKET FRONT

### 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

### On the Market Front Boxes

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 3.1

### Concept Checks

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.

### EXAMPLE 2.4

#### 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 Examples

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

## Buying on Margin

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			<b>Action or Formula for Column B</b>	<b>Ending St Price</b>	<b>Return on Investment</b>		<b>Ending St Price</b>	<b>Return with No Margin</b>
3								
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	<b>Return on Investment</b>			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					
21	Initial Investment	\$10,000.00	B4				<b>LEGEND:</b>	
22	Return on Investment	-42.00%	B20/B21				Enter data	
							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

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

**PROBLEM SETS**

1. In forming a portfolio of two risky assets, what must be true of the correlation coefficient between their returns if there are to be gains from diversification? Explain. (LO 6-1)
2. When adding a risky asset to a portfolio of many risky assets, which property of the asset has a greater influence on risk: its standard deviation or its covariance with the portfolio? Explain. (LO 6-2)

18. You are bullish on Telecom stock. The current market price is \$50 per share, and you have \$5,000 of your own to invest. You borrow an additional \$5,000 from your broker at an interest rate of 8% per year and invest \$10,000 in the stock. (LO 3-4)

- a. What will be your rate of return if the price of Telecom stock goes up by 10% during the next year? (Ignore the expected dividend.)
- b. How far does the price of Telecom stock have to fall for you to get a margin call if the maintenance margin is 30%? Assume the price fall happens immediately.

**Σ**  
Templates and spreadsheets are available in Connect

**KAPLAN**  
SCHWESER

11. Where would an illiquid security in a developing economy *most likely* trade? (LO 3-3)
  - a. Broker markets.
  - b. Electronic crossing networks.
  - c. Electronic limit-order markets.
12. Are the following statements true or false? If false, correct them. (LO 3-4)
  - a. An investor who wishes to sell shares immediately should ask his or her broker to enter a limit order.
  - b. The ask price is less than the bid price.

1. Jones Group has been generating stable after-tax return on equity (ROE) despite declining operating income. Explain how it might be able to maintain its stable after-tax ROE. (LO 14-3)

2. Which of the following *best* explains a ratio of "net sales to average net fixed assets" that *exceeds* the industry average? (LO 14-3)

- a. The firm added to its plant and equipment in the past few years.
- b. The firm makes less efficient use of its assets than other firms.
- c. The firm has a lot of old plant and equipment.
- d. The firm uses straight-line depreciation.

**CFA Problems**  
CFA® PROBLEMS

**WEB master**

1. Go to the website for The Walt Disney Co. (DIS) and download its most recent annual report (its 10-K). Locate the company's Consolidated Balance Sheets and answer these questions:
  - a. How much preferred stock is Disney authorized to issue? How much has been issued?
  - b. How much common stock is Disney authorized to issue? How many shares are currently outstanding?
  - c. Search for the term "Financing Activities." What is the total amount of borrowing listed for Disney? How much of this is medium-term notes?
  - d. What other types of debt does Disney have outstanding?
2. Not all stock market indexes are created equal. Different methods are used to calculate various indexes, and different indexes will yield different assessments of "market

## Problem Sets

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.

## Excel Problems

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

## Kaplan-Schweser Problems

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.

## CFA Problems

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.

## Web Master Exercises

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®

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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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### Instructor Library

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.

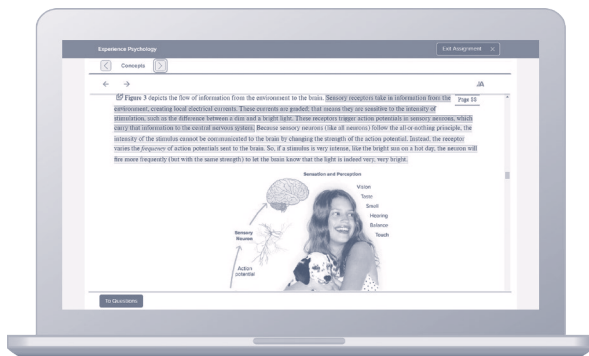


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*"I really liked this app—it made it easy to study when you don't have your textbook in front of you."*

- Jordan Cunningham,  
Eastern Washington University



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# Acknowledgments

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Bala Arshanapalli *Indiana University Northwest*

Rasha Ashraf *Georgia State University*

Anand Bhattacharya *Arizona State University, Tempe*

Randall S. Billingsley *Virginia Polytechnic Institute and State University*

Howard Bohnen *St. Cloud State University*

Paul Bolster *Northeastern University*

Lyle Bowlin *University of Northern Iowa*

Brian Boyer *Brigham Young University*

Nicole Boyson *Northeastern University*

Ben Branch *University of Massachusetts, Amherst*

Thor W. Bruce *University of Miami*

Timothy Burch *University of Miami, Coral Gables*

Alyce R. Campbell *University of Oregon*

Mark Castelino *Rutgers University*

Greg Chaudoin *Loyola University*

Ji Chen *University of Colorado, Denver*

Joseph Chen *University of California, Davis*

Mustafa Chowdhury *Louisiana State University*

Ron Christner *Loyola University, New Orleans*

Shane Corwin *University of Notre Dame*

Brent Dalrymple *University of Central Florida*

Praveen Das *University of Louisiana, Lafayette*

Diane Del Guercio *University of Oregon*

David C. Distad *University of California at Berkeley*

Gary R. Dokes *University of San Diego*

James Dow *California State University, Northridge*

Robert Dubil *University of Utah, Salt Lake City*

John Earl *University of Richmond*

Jeff Edwards *Portland Community College*

Peter D. Ekman *Kansas State University*

John Elder *Colorado State University*

Richard Elliott *University of Utah, Salt Lake City*

James Falter *Franklin University*

Philip Fanara *Howard University*

Joseph Farinella *University of North Carolina, Wilmington*

Greg Feigel *University of Texas, Arlington*

James F. Feller *Middle Tennessee State University*

James Forjan *York College*

Beverly Frickel *University of Nebraska, Kearney*

Ken Froewiss *New York University*

Phillip Ghazanfari *California State University, Pomona*

Eric Girard *Siena College*

Richard A. Grayson *University of Georgia*

Greg Gregoriou *SUNY, Plattsburgh*

Richard D. Gritta *University of Portland*

Anthony Yanxiang Gu *SUNY Geneseo*

Deborah Gunthorpe *University of Tennessee*

Weiyu Guo *University of Nebraska, Omaha*

Pamela Hall *Western Washington University*

Thomas Hamilton *St. Mary's University*

Bing Han *University of Texas, Austin*

Yvette Harman *Miami University of Ohio*

Gay Hatfield *University of Mississippi*

Larry C. Holland *Oklahoma State University*

Harris Hordon *New Jersey City University*

Stephen Huffman *University of Wisconsin, Oshkosh*

Ron E. Hutchins *Eastern Michigan University*

David Ikenberry *University of Illinois, Urbana-Champaign*

A. Can (John) Inci *Florida State University*

Victoria Javine *University of Southern Alabama*

Nancy Jay *Mercer University*

Richard Johnson *Colorado State University*

Douglas Kahl *University of Akron*

Richard J. Kish *Lehigh University*

Tom Krueger *University of Wisconsin, La Crosse*

Donald Kummer *University of Missouri, St. Louis*

Merouane Lakehal-Ayat *St. John Fisher College*

Reinhold P. Lamb *University of North Florida*

Angeline Lavin *University of South Dakota*

Hongbok Lee *Western Illinois University*

Kartono Liano *Mississippi State University*

Jim Locke *Northern Virginia Community College*

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David Louton *Bryant College*

David Loy *Illinois State University*