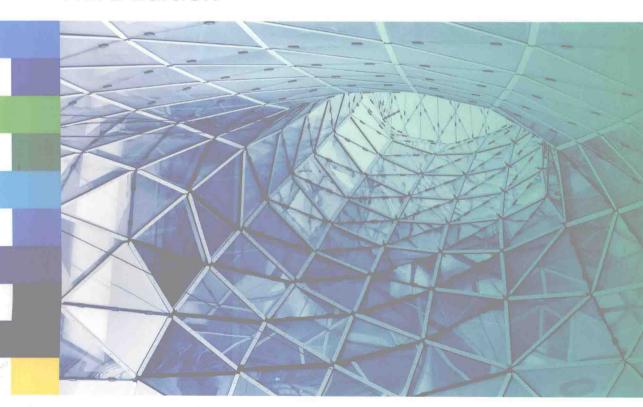


CFA INSTITUTE INVESTMENT SERIES

EQUITY ASSET VALUATION

Third Edition



Jerald E. Pinto, CFA = Elaine Henry, CFA
Thomas R. Robinson, CFA = John D. Stowe, CFA

Foreword by Paul F. Miller, Jr., CFA

EQUITY ASSET VALUATION

Third Edition

Jerald E. Pinto, CFA
Elaine Henry, CFA
Thomas R. Robinson, CFA
John D. Stowe, CFA
with
Stephen E. Wilcox, CFA

WILEY

Cover image: © ER_09/Shutterstock

Cover design: Wiley

Copyright © 2004, 2007, 2015 by CFA Institute. All rights reserved.

Published by John Wiley & Sons, Inc., Hoboken, New Jersey. Published simultaneously in Canada.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning, or otherwise, except as permitted under Section 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600, or on the Web at www.copyright.com. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at www.wiley.com/go/permissions.

Limit of Liability/Disclaimer of Warranty: While the publisher and author have used their best efforts in preparing this book, they make no representations or warranties with respect to the accuracy or completeness of the contents of this book and specifically disclaim any implied warranties of merchantability or fitness for a particular purpose. No warranty may be created or extended by sales representatives or written sales materials. The advice and strategies contained herein may not be suitable for your situation. You should consult with a professional where appropriate. Neither the publisher nor author shall be liable for any loss of profit or any other commercial damages, including but not limited to special, incidental, consequential, or other damages.

For general information on our other products and services or for technical support, please contact our Customer Care Department within the United States at (800) 762-2974, outside the United States at (317) 572-3993, or fax (317) 572-4002.

Wiley publishes in a variety of print and electronic formats and by print-on-demand. Some material included with standard print versions of this book may not be included in e-books or in print-on-demand. If this book refers to media such as a CD or DVD that is not included in the version you purchased, you may download this material at http://booksupport.wiley.com. For more information about Wiley products, visit www.wiley.com.

ISBN 978-1-119-10426-1 (Hardcover) ISBN 978-1-119-10462-9 (ePDF) ISBN 978-1-11910464-3 (ePub)

Printed in the United States of America. 10 9 8 7 6 5 4 3 2 1

EQUITY ASSET VALUATION

CFA Institute is the premier association for investment professionals around the world, with over 130,000 members in 151 countries and territories. Since 1963 the organization has developed and administered the renowned Chartered Financial Analyst® Program. With a rich history of leading the investment profession, CFA Institute has set the highest standards in ethics, education, and professional excellence within the global investment community and is the foremost authority on investment profession conduct and practice. Each book in the CFA Institute Investment Series is geared toward industry practitioners along with graduate-level finance students and covers the most important topics in the industry. The authors of these cutting-edge books are themselves industry professionals and academics and bring their wealth of knowledge and expertise to this series.

FOREWORD

Security analysis, for whatever purpose, is incomplete without a valuation of the asset being analyzed. So, studying the economics and finances of a business is simply preparation for that valuation.

When I entered the investment business in 1952, I was handed the task of analyzing and valuing about a dozen common stocks. My business school education had prepared me to analyze the economics and finances of a business, but it came up short on the elements of valuation techniques.

In those days, valuation thinking was still influenced by the Great Depression. Ridiculous as it may sound today, we tried to estimate what a company's earnings might be in the event of a recession in GDP in the range of 10 to 15 percent, with the next step being placing a multiplier on those depressed earnings. The result was what we called "sound value." Of course, the resulting values did not materialize in the bull market of the following years.

The art of security analysis has evolved significantly since then. What fascinates me is how and why the valuation techniques have evolved. The main cause, in my opinion, lies in the accumulating evidence that U.S. and world economies have become significantly more resilient to major declines. Today, for economically sensitive businesses, valuations tend to use normalizing techniques rather than attempting to estimate cyclical peaks and troughs.

The valuation methods explored in this book can be applied by different types of investors, in different market environments, and for different types of transactions. When reading Wall Street research reports or listening to financial TV programs, it is rare to see or hear a well-designed valuation. Usually, the valuation process consists of attaching an earnings multiple to an estimated earnings growth rate. This book provides an excellent review of the fundamentals and techniques used to value equity assets.

No single valuation technique suits all investors in all types of transactions, and this book adequately recognizes that fact. No matter your level of financial sophistication, you can benefit from reading it.

Paul F. Miller, Jr., CFA

PREFACE

We are pleased to bring you *Equity Asset Valuation*, *Third Edition*. We believe this book serves as a particularly important resource for anyone involved in estimating the value of securities and understanding security pricing.

The content was developed in partnership by a team of distinguished academics and practitioners, chosen for their acknowledged expertise in the field, and guided by CFA Institute. It is written specifically with the investment practitioner in mind and is replete with examples and practice problems that reinforce the learning outcomes and demonstrate real-world applicability.

The CFA Program Curriculum, from which the content of this book was drawn, is subjected to a rigorous review process to assure that it is:

- · Faithful to the findings of our ongoing industry practice analysis
- Valuable to members, employers, and investors
- Globally relevant
- · Generalist (as opposed to specialist) in nature
- · Replete with sufficient examples and practice opportunities
- · Pedagogically sound

The accompanying workbook is a useful reference that provides Learning Outcome Statements, which describe exactly what readers will learn and be able to demonstrate after mastering the accompanying material. Additionally, the workbook has summary overviews and practice problems for each chapter.

We hope you will find this and other books in the CFA Institute Investment Series helpful in your efforts to grow your investment knowledge, whether you are a relatively new entrant or an experienced veteran striving to keep up to date in the ever-changing market environment. CFA Institute, as a long-term committed participant in the investment profession and a not-for-profit global membership association, is pleased to provide you with this opportunity.

THE CFA PROGRAM

If the subject matter of this book interests you and you are not already a CFA Charterholder, we hope you will consider registering for the CFA Program and starting progress toward earning the Chartered Financial Analyst designation. The CFA designation is a globally recognized standard of excellence for measuring the competence and integrity of investment professionals. To earn the CFA charter, candidates must successfully complete the CFA Program, a global graduate-level self-study program that combines a broad curriculum with professional conduct requirements as preparation for a career as an investment professional.

Anchored by a practice-based curriculum, the CFA Program Body of Knowledge reflects the knowledge, skills, and abilities identified by professionals as essential to the investment decision-making process. This body of knowledge maintains its relevance through a regular, extensive survey of practicing CFA charterholders across the globe. The curriculum covers 10 general topic areas, ranging from equity and fixed-income analysis to portfolio management to corporate finance—all with a heavy emphasis on the application of ethics in professional practice. Known for its rigor and breadth, the CFA Program curriculum highlights principles common to every market so that professionals who earn the CFA designation have a thoroughly global investment perspective and a profound understanding of the global marketplace.

CFA INSTITUTE

CFA Institute is the premier association for investment professionals around the world, with over 130,000 members in 151 countries and territories. Since 1963, the organization has developed and administered the renowned Chartered Financial Analyst® Program. With a rich history of leading the investment profession, CFA Institute has set the highest standards in ethics, education, and professional excellence within the global investment community and is the foremost authority on investment profession conduct and practice. Each book in the CFA Institute Investment Series is geared toward industry practitioners along with graduate-level finance students and covers the most important topics in the industry.

ACKNOWLEDGMENTS

We would like to thank these distinguished practitioners for enriching the book with writing in their areas of expertise:

Matthew L. Coffina, CFA Patrick W. Dorsey, CFA Anthony M. Fiore, CFA Ian Rossa O'Reilly, CFA Raymond D. Rath, CFA Antonius J. van Ooijen, CFA

We are indebted to Stephen E. Wilcox, CFA, for his work in updating the in-text self-test examples for all but three chapters of this book. His contribution was essential to the fresh look of this third edition.

Wendy L. Pirie, CFA, and Gregory Siegel, CFA, helped in verifying the accuracy of the text. Margaret Hill, Wanda Lauziere, and Julia MacKesson and the production team at CFA Institute provided essential support through the various stages of production. Robert E. Lamy, CFA, and Christopher B. Wiese, CFA, encouraged and oversaw the production of a third edition.

Finally, we are honored that Paul F. Miller, Jr., CFA, agreed to provide this book with a foreword.

ABOUT THE CFA INSTITUTE INVESTMENT SERIES

CFA Institute is pleased to provide you with the CFA Institute Investment Series, which covers major areas in the field of investments. We provide this best-in-class series for the same reason we have been chartering investment professionals for more than 50 years: to lead the investment profession globally by setting the highest standards of ethics, education, and professional excellence.

The books in the CFA Institute Investment Series contain practical, globally relevant material. They are intended both for those contemplating entry into the extremely competitive field of investment management as well as for those seeking a means of keeping their knowledge fresh and up to date. This series was designed to be user friendly and highly relevant.

We hope you find this series helpful in your efforts to grow your investment knowledge, whether you are a relatively new entrant or an experienced veteran ethically bound to keep up to date in the ever-changing market environment. As a long-term, committed participant in the investment profession and a not-for-profit global membership association, CFA Institute is pleased to provide you with this opportunity.

THE TEXTS

Corporate Finance: A Practical Approach is a solid foundation for those looking to achieve lasting business growth. In today's competitive business environment, companies must find innovative ways to enable rapid and sustainable growth. This text equips readers with the foundational knowledge and tools for making smart business decisions and formulating strategies to maximize company value. It covers everything from managing relationships between stakeholders to evaluating merger and acquisition bids, as well as the companies behind them. Through extensive use of real-world examples, readers will gain critical perspective into interpreting corporate financial data, evaluating projects, and allocating funds in ways that increase corporate value. Readers will gain insights into the tools and strategies used in modern corporate financial management.

Fixed Income Analysis has been at the forefront of new concepts in recent years, and this particular text offers some of the most recent material for the seasoned professional who is not a fixed-income specialist. The application of option and derivative technology to the once staid province of fixed income has helped contribute to an explosion of thought in this area. Professionals have been challenged to stay up to speed with credit derivatives, swaptions, collateralized mortgage securities, mortgage-backed securities, and other vehicles, and this explosion of products has strained the world's financial markets and tested central banks to provide

sufficient oversight. Armed with a thorough grasp of the new exposures, the professional investor is much better able to anticipate and understand the challenges our central bankers and markets face.

International Financial Statement Analysis is designed to address the ever-increasing need for investment professionals and students to think about financial statement analysis from a global perspective. The text is a practically oriented introduction to financial statement analysis that is distinguished by its combination of a true international orientation, a structured presentation style, and abundant illustrations and tools covering concepts as they are introduced in the text. The authors cover this discipline comprehensively and with an eye to ensuring the reader's success at all levels in the complex world of financial statement analysis.

Investments: Principles of Portfolio and Equity Analysis provides an accessible yet rigorous introduction to portfolio and equity analysis. Portfolio planning and portfolio management are presented within a context of up-to-date, global coverage of security markets, trading, and market-related concepts and products. The essentials of equity analysis and valuation are explained in detail and profusely illustrated. The book includes coverage of practitioner-important but often neglected topics, such as industry analysis. Throughout, the focus is on the practical application of key concepts with examples drawn from both emerging and developed markets. Each chapter affords the reader many opportunities to self-check his or her understanding of topics.

One of the most prominent texts over the years in the investment management industry has been Maginn and Tuttle's *Managing Investment Portfolios: A Dynamic Process*. The third edition updates key concepts from the 1990 second edition. Some of the more experienced members of our community own the prior two editions and will add the third edition to their libraries. Not only does this seminal work take the concepts from the other readings and put them in a portfolio context, but it also updates the concepts of alternative investments, performance presentation standards, portfolio execution, and, very importantly, individual investor portfolio management. Focusing attention away from institutional portfolios and toward the individual investor makes this edition an important and timely work.

Quantitative Investment Analysis focuses on some key tools that are needed by today's professional investor. In addition to classic time value of money, discounted cash flow applications, and probability material, there are two aspects that can be of value over traditional thinking.

The New Wealth Management: The Financial Advisor's Guide to Managing and Investing Client Assets is an updated version of Harold Evensky's mainstay reference guide for wealth managers. Harold Evensky, Stephen Horan, and Thomas Robinson have updated the core text of the 1997 first edition and added an abundance of new material to fully reflect today's investment challenges. The text provides authoritative coverage across the full spectrum of wealth management and serves as a comprehensive guide for financial advisors. The book expertly blends investment theory and real-world applications and is written in the same thorough but highly accessible style as the first edition. The first involves the chapters dealing with correlation and regression that ultimately figure into the formation of hypotheses for purposes of testing. This gets to a critical skill that challenges many professionals: the ability to distinguish useful information from the overwhelming quantity of available data. Second, the final chapter of Quantitative Investment Analysis covers portfolio concepts and takes the reader beyond the

traditional capital asset pricing model (CAPM) type of tools and into the more practical world of multifactor models and arbitrage pricing theory.

All books in the CFA Institute Investment Series are available through all major book-sellers. And, all titles are available on the Wiley Custom Select platform at http://customselect.wiley.com/ where individual chapters for all the books may be mixed and matched to create custom textbooks for the classroom.

CONTENTS

Forewo	ord	X1
Preface		xiii
Acknow	wledgments	xv
About	the CFA Investment Series	xvii
CHAP'		
Equ	ity Valuation: Applications & Processes	1
1.	Learning Outcomes Introduction	1 2
	Value Definitions and Valuation Applications	
	2.1. What Is Value?	2 2 5 7
	2.2. Applications of Equity Valuation	5
3.	The Valuation Process	
	3.1. Understanding the Business	8
	3.2. Forecasting Company Performance	17
	3.3. Selecting the Appropriate Valuation Model	18
	3.4. Converting Forecasts to a Valuation	25
	3.5. Applying the Valuation Conclusion: The Analyst's Role and Responsibilities	
4.	Communicating Valuation Results	28
	4.1. Contents of a Research Report	28
	4.2. Format of a Research Report 4.3. Research Reporting Responsibilities	30 32
5.	4.3. Research Reporting Responsibilities Summary	33
).	References	34
	Problems	35
CHAD	PTER 2	
		20
Ket	urn Concepts	39
	Learning Outcomes	39
1.	Introduction	40
2.	Return Concepts	40

vi

	2.1. Holding Period Return	40
	2.2. Realized and Expected (Holding Period) Return	41
	2.3. Required Return	41
	2.4. Expected Return Estimates from Intrinsic Value Estimates	43
	2.5. Discount Rate	45
	2.6. Internal Rate of Return	46
3.	The Equity Risk Premium	47
	3.1. Historical Estimates	48
	3.2. Forward-Looking Estimates	57
4.	The Required Return on Equity	60
	4.1. The Capital Asset Pricing Model	60
	4.2. Multifactor Models	68
	4.3. Build-Up Method Estimates of the Required Return on Equity	75
	4.4. The Required Return on Equity: International Issues	79
	The Weighted Average Cost of Capital	80
6.	Discount Rate Selection in Relation to Cash Flows	82
7.	Summary	82
	References	84
	Problems	85
07747		
	TER 3	
Inti	roduction to Industry and Company Analysis	91
	Learning Outcomes	91
1.	Introduction	92
2.	Uses of Industry Analysis	92
3.	Approaches to Identifying Similar Companies	93
	3.1. Products and/or Services Supplied	93
	3.2. Business-Cycle Sensitivities	94
	3.3. Statistical Similarities	95
4.	Industry Classification Systems	96
	4.1. Commercial Industry Classification Systems	96
	4.2. Governmental Industry Classification Systems	100
	4.3. Strengths and Weaknesses of Current Systems	101
	4.4. Constructing a Peer Group	102
5.	Describing and Analyzing an Industry	106
	5.1. Principles of Strategic Analysis	109
	5.2. External Influences on Industry Growth, Profitability, and Risk	129
6.	Company Analysis	135
	6.1. Elements That Should be Covered in a Company Analysis	136
	6.2. Spreadsheet Modeling	139
7.	Summary	139
	References	142
	Problems	143

Contents

		TER 4	
	Ind	ustry and Company analysis	147
		Learning Outcomes	147
	1.	Introduction	148
	2.	Financial Modeling: An Overview	148
		2.1. Income Statement Modeling: Revenue	148
		2.2. Income Statement Modeling: Operating Costs	154
		2.3. Income Statement Modeling: Non-Operating Costs	167
		2.4. Income Statement Modeling: Other Items	172
		2.5. Balance Sheet and Cash Flow Statement Modeling	172
		2.6. Scenario Analysis and Sensitivity Analysis	174
A	3.	The Impact of Competitive Factors on Prices and Costs	176
	4.	Inflation and Deflation	184
		4.1. Sales Projections with Inflation and Deflation	184
		4.2. Cost Projections with Inflation and Deflation	190
		Technological Developments	192
		Long-Term Forecasting	203
	7.	Building a Model	209
		7.1. Industry Overview	209
		7.2. Company Overview	210
		7.3. Construction of Pro Forma Income Statement	211
		7.4. Construction of Pro Forma Cash Flow Statement and	
		Balance Sheet	217
		7.5. Valuation Inputs	223
	8.	Summary	223
		References	224
		Problems	224
C		PTER 5	
	Dis	counted Dividend Valuation	231
		Learning Outcomes	231
		Introduction	232
	2.	Present Value Models	233
		2.1. Valuation Based on the Present Value of Future Cash Flows	233
		2.2. Streams of Expected Cash Flows	235
	3.	The Dividend Discount Model	241
		3.1. The Expression for a Single Holding Period	241
		3.2. The Expression for Multiple Holding Periods	242
	4.	The Gordon Growth Model	244
		4.1. The Gordon Growth Model Equation	245
		4.2. The Links Among Dividend Growth, Earnings Growth, and Value	
		Appreciation in the Gordon Growth Model	252
		4.3. Share Repurchases	252
		4.4. The Implied Dividend Growth Rate	253
		4.5. The Present Value of Growth Opportunities	254
		4.6. Gordon Growth Model and the Price-to-Earnings Ratio	256

viii Contents

	4.7. Estimating a Required Return Using the Gordon Growth Model	259
	4.8. The Gordon Growth Model: Concluding Remarks	259
5.	Multistage Dividend Discount Models	260
	5.1. Two-Stage Dividend Discount Model	261
	5.2. Valuing a Non-Dividend-Paying Company	264
	5.3. The H-Model	265
	5.4. Three-Stage Dividend Discount Models	267
	5.5. Spreadsheet (General) Modeling	272
	5.6. Estimating a Required Return Using Any DDM	274
	5.7. Multistage DDM: Concluding Remarks	276
6.	The Financial Determinants of Growth Rates	276
	6.1. Sustainable Growth Rate	276
	6.2. Dividend Growth Rate, Retention Rate, and ROE Analysis	278
	6.3. Financial Models and Dividends	281
7.	Summary	283
	References	286
	Problems	287
CHAI	PTER 6	
Fre	e Cash Flow Valuation	295
	Learning Outcomes	295
1.	Introduction to Free Cash Flows	296
2.	FCFF and FCFE Valuation Approaches	296
	2.1. Defining Free Cash Flow	297
	2.2. Present Value of Free Cash Flow	298
	2.3. Single-Stage (Constant-Growth) FCFF and FCFE Models	299
3.	Forecasting Free Cash Flow	301
	3.1. Computing FCFF from Net Income	301
	3.2. Computing FCFF from the Statement of Cash Flows	305
	3.3. Noncash Charges	307
	3.4. Computing FCFE from FCFF	312
	3.5. Finding FCFF and FCFE from EBIT or EBITDA	318
	3.6. FCFF and FCFE on a Uses-of-Free-Cash-Flow Basis	320
	3.7. Forecasting FCFF and FCFE	322
	3.8. Other Issues in Free Cash Flow Analysis	327
4.	Free Cash Flow Model Variations	333
	4.1. An International Application of the Single-Stage Model	333
	4.2. Sensitivity Analysis of FCFF and FCFE Valuations	334
	4.3. Two-Stage Free Cash Flow Models	336
	4.4. Three-Stage Growth Models	343
5.	Nonoperating Assets and Firm Value	345
6.	Summary	346
	References	348
	Problems	348

ix

CHAP	TER 7	
Mai	rket-Based Valuation: Price and Enterprise Value Multiples	361
	Learning Outcomes	361
T	Learning Outcomes Introduction	362
	Price and Enterprise Value Multiples in Valuation	363
4.	2.1. The Method of Comparables	363
	2.2. The Method Based on Forecasted Fundamentals	365
3.	Price Multiples	366
J.	3.1. Price to Earnings	366
	3.2. Price to Book Value	399
	3.3. Price to Sales	410
	3.4. Price to Cash Flow	417
	3.5. Price to Dividends and Dividend Yield	422
4.	Enterprise Value Multiples	426
	4.1. Enterprise Value to EBITDA	426
	4.2. Other Enterprise Value Multiples	432
	4.3. Enterprise Value to Sales	433
	4.4. Price and Enterprise Value Multiples in a Comparable Analysis: Some	
	Illustrative Data	433
5.	International Considerations When Using Multiples	435
6.		437
7.	Valuation Indicators: Issues in Practice	442
	7.1. Averaging Multiples: The Harmonic Mean	442
	7.2. Using Multiple Valuation Indicators	444
8.	Summary	449
	References	452
	Problems	454
CHAI	PTER 8	
Res	sidual Income Valuation	463
		200
	Learning Outcomes	463
1.	Introduction	464
2.		464
	2.1. The Use of Residual Income in Equity Valuation	467
	2.2. Commercial Implementations	468
3.	The Residual Income Model	469
	3.1. The General Residual Income Model	472
	3.2. Fundamental Determinants of Residual Income	477
	3.3. Single-Stage Residual Income Valuation	478
	3.4. Multistage Residual Income Valuation	480
4.	The state of the s	484
	4.1. Strengths and Weaknesses of the Residual Income Model	487
-	4.2. Broad Guidelines for Using a Residual Income Model	487
5.	The state of the s	488
	5.1. Violations of the Clean Surplus Relationship	489
	5.2. Balance Sheet Adjustments for Fair Value	498