Real Estate Finance and Investments

Sixteenth Edition

William B. Brueggeman, PhD

Corrigan Chair in Real Estate Edwin L. Cox School of Business Southern Methodist University

Jeffrey D. Fisher, PhD

Professor Emeritus of Real Estate Kelley School of Business Indiana University President, Homer Hoyt Institute



Brief Contents

Preface iii

PART ONE

Overview of Real Estate Finance and Investments

- 1 Real Estate Investment: Basic Legal Concepts 1
- 2 Real Estate Financing: Notes and Mortgages 16

PART TWO

Mortgage Loans

- **3** Mortgage Loan Foundations: The Time Value of Money 42
- 4 Fixed Interest Rate Mortgage Loans 78
- Adjustable and Floating Rate Mortgage Loans 122
- 6 Mortgages: Additional Concepts, Analysis, and Applications 150

PART THREE

Residential Housing

- 7 Single-Family Housing: Pricing,Investment, and Tax Considerations 185
- **8** Underwriting and Financing Residential Properties 222

PART FOUR

Income-Producing Properties

- 9 Income-Producing Properties: Leases, Rents, and the Market for Space 254
- 10 Valuation of Income Properties: Appraisal and the Market for Capital 297
- **11** Investment Analysis and Taxation of Income Properties 348

- **12** Financial Leverage and Financing Alternatives 398
- **13** Risk Analysis 433
- **14** Disposition and Renovation of Income Properties 467
- **15** Financing Corporate Real Estate 503

PART FIVE

Financing Real Estate Development

- **16** Financing Project Development 526
- 17 Financing Land Development Projects 561

PART SIX

Alternative Real Estate Financing and Investment Vehicles

- 18 Structuring Real Estate Investments: Organizational Forms and Joint Ventures 590
- **19** The Secondary Mortgage Market: Pass-Through Securities 629
- The Secondary Mortgage Market: CMOs and Derivative Securities 657
- 21 Real Estate Investment Trusts (REITs) 698

PART SEVEN

Portfolio Analysis and Real Estate Funds

- **22** Real Estate Investment Performance and Portfolio Considerations 732
- **23** Real Estate Investment Funds: Structure, Performance, Benchmarking, and Attribution Analysis 761

INDEX 800



Table of Contents

Preface iii	Alternatives to Foreclosure: Workouts 27 Restructuring the Mortgage Loan 27
PART ONE OVERVIEW OF REAL ESTATE FINANCE AND INVESTMENTS	Transfer of Mortgage to a New Owner 29 Voluntary Conveyance 29 Friendly Foreclosure 30 Prepackaged Bankruptcy 30 Short Sale 31
Chapter 1 Real Estate Investment: Basic Legal Concepts 1	Foreclosure 31 Judicial Foreclosure 31 Redemption 32 Sales of Property 32
Property Rights and Estates 2 Definition of Estate 4 Two General Classifications of Estates 4 Examples of Freehold Estates 4 Estates Not Yet in Possession (Future Estates) 5 Examples of Leasehold Estates 5 Interests, Encumbrances, and Easements 6 Assurance of Title 7	Effect of Foreclosure on Junior Lienors 35 Deficiency Judgment 35 Taxes in Default 36 Bankruptcy 37 Chapter 7 Liquidation 37 Chapter 11 38 Chapter 13 39
The Meaning of Title 7 Deeds 9 Methods of Title Assurance 9 Abstract and Opinion Method 11	PART TWO MORTGAGE LOANS
The Title Insurance Method 11 Recording Acts 12 Limitations on Property Rights 13	Chapter 3 Mortgage Loan Foundations: The Time Value of Money 42
Chapter 2	Compound Interest 42 Compound or Future Value 43
Real Estate Financing: Notes and Mortgages 16	Calculating Compound Interest Factors 47
_	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and
Mortgages 16	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and
Mortgages 16 Notes 16	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22 Acquiring Title "Subject to" a Mortgage 23	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61 Accumulation of a Future Sum 64
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22 Acquiring Title "Subject to" a Mortgage 23 Property Covered by a Mortgage 23	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22 Acquiring Title "Subject to" a Mortgage 23 Property Covered by a Mortgage 23 Junior Mortgages 24	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61 Accumulation of a Future Sum 64 Determining Yields, or Internal Rates of
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22 Acquiring Title "Subject to" a Mortgage 23 Property Covered by a Mortgage 23 Junior Mortgages 24 Recording of Mortgages 24 Other Financing Sources 25 Seller Financing 25	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61 Accumulation of a Future Sum 64 Determining Yields, or Internal Rates of Return, on Investments 65
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22 Acquiring Title "Subject to" a Mortgage 23 Property Covered by a Mortgage 23 Junior Mortgages 24 Recording of Mortgages 24 Other Financing Sources 25	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61 Accumulation of a Future Sum 64 Determining Yields, or Internal Rates of Return, on Investments 65 Investments with Single Receipts 65
Mortgages 16 Notes 16 The Mortgage Instrument 18 Definition of a Mortgage 18 Relationship of Note to Mortgage 18 Interests That Can Be Mortgaged 19 Minimum Mortgage Requirements 19 Important Mortgage Covenants 20 Assumption of Mortgage 22 Acquiring Title "Subject to" a Mortgage 23 Property Covered by a Mortgage 23 Junior Mortgages 24 Recording of Mortgages 24 Other Financing Sources 25 Seller Financing 25	Calculating Compound Interest Factors 47 Using Financial Functions: Calculators and Spreadsheets 49 Present Value 52 A Graphic Illustration of Present Value 52 Expanding the Use of Calculators for Finding Present Values 54 Compound or Future Value of an Annuity 56 Use of Compound Interest Factors for Annuities 58 Present Value of an Annuity 60 Use of the Present Value of an Annuity Factors 61 Accumulation of a Future Sum 64 Determining Yields, or Internal Rates of Return, on Investments 65 Investments with Single Receipts 65 Yields on Investment Annuities 68

Chapter 4	Risk Premiums, Interest Rate Risk, and Default Risk 133
Fixed Interest Rate Mortgage Loans 78	Expected Yield Relationships and Interest Rate
Determinants of Mortgage Interest Rates: A Brief	Risk 135
Overview 78	More Complex Features 136
The Real Rate of Interest: Underlying Considerations 79	ARM Payment Mechanics 138
Interest Rates and Inflation Expectations 79	Expected Yields on ARMs: A Comparison 143
Interest Rates and Risk 80	
A Summary of Factors Important in Mortgage Loan	Chapter 6
Pricing 82	Mortgages: Additional Concepts, Analysis,
Understanding Fixed Interest Rate Mortgage (FRM) Loan Terms 82	and Applications 150
Calculating Payments and Loan Balances—Fixed	
Interest Rate Loans 84	Incremental Borrowing Cost 150
The Importance of Accrued Interest and Loan Payments 84	Early Repayment 152
Loan Amortization Patterns 84	Origination Fees 153
Fully Amortizing, Constant Payment Mortgage (CPM)	Incremental Borrowing Cost versus a Second
Loans 85	Mortgage 154
Partially Amortizing, Constant Payment Mortgage (CPM)	Relationship between the Incremental Cost and the Loan-to-Value Ratio 154
Loans 89	Differences in Maturities 157
Zero Amortizing, or Interest-Only—Constant Payment	Loan Refinancing 158
Mortgage (CPM) Loans 90	Early Repayment: Loan Refinancing 159
Negative Amortizing, Constant Payment Mortgage	Effective Cost of Refinancing 161
(CPM) Loans 91	Borrowing the Refinancing Costs 161
Summary and Comparisons: Fixed Interest Rate,	Other Considerations 162
Constant Payment Mortgage (CPM) Loans with	Early Loan Repayment: Lender Inducements 164
Various Amortization Patterns 92	Market Value of a Loan 165
Determining Loan Balances 94	Effective Cost of Two or More Loans 166
Finding Loan Balances—Other Amortization	Second Mortgages and Shorter Maturities 168
Patterns 95	Effect of Below-Market Financing on Property Prices 169
Loan Closing Costs and Effective Borrowing Costs 96	Assuming a Lower Loan Balance 172
Loan Fees and Early Repayment: Fully Amortizing Loans 99	Cash Equivalency 172
Charging Fees to Achieve Yield, or When "Pricing"	Cash Equivalency: Smaller Loan Balance 173
FRMs 103	Cash Equivalency: Concluding Comments 174
Financing Loan Fees and Other Closing Costs 104 Other FRM Loan Patterns—Declining Payments	Wraparound Loans 174
and Constant Amortization Rates 104	Buydown Loans 177
Amortization Schedules and Callable Loans 105	Appendix
"Reverse Mortgages" 106	After-Tax Effective Interest Rate 181
Appendix	
Inflation, Mortgage Pricing, and Payment	PART THREE
Structuring 113	RESIDENTIAL HOUSING
Chapter 5	Chapter 7
Adjustable and Floating Rate Mortgage	Single-Family Housing: Pricing, Investment,
Loans 122	and Tax Considerations 185
The Price Level Adjusted Mortgage (PLAM) 124	Overview 185
PLAM: Payment Mechanics 124	House Prices 185

Income and Employment 186

Renting versus Owning 187

ARMs and Floating Rate Loans: An Overview 126

Variations: ARM and Floating Rate Loans 129

Analyzing Expected House Prices 193 Economic Base Analysis—Location Quotients 197 Housing Supply: An Overview 198 Submarkets: Neighborhoods/Municipalities 199	PART FOUR INCOME-PRODUCING PROPERTIES
Capitalization Effects: Price Premiums 199 Pricing Property in Specific Submarkets/Locations 201 Investing in "Distressed Properties" 209 Financial Framework for Analyzing Distressed	Chapter 9 Income-Producing Properties: Leases, Rents and the Market for Space 254
Properties 210 Acquisition Phase 210 Holding Period Phase 214 Disposition Phase—Exit Strategies 218	Property Types 254 Supply and Demand Analysis 256 Local Market Studies of Supply and Demand 259 Location and User-Tenants 260 The Business of Real Estate 262
Chapter 8 Underwriting and Financing Residential Properties 222	The "Market" for Income-Producing Real Estate 263 Income Potential—Real Estate Assets 264 Vacancy 265 Underwriting Tenants 266
Underwriting Default Risk 222 Classification of Mortgage Loans 223 Conventional Mortgage Loans 223 Insured Conventional Mortgage Loans 224 FHA-Insured Mortgage Loans 226 VA-Guaranteed Mortgage Loans 226	General Contents of Leases 266 Leases and Rental Income 270 Leases and Responsibility for Expenses (Recoveries) 270 Comparing Leases: Effective Rent 273
The Underwriting Process 227 Borrower Income 227 Verification of Borrower Assets 229 Assessment of Credit History 229 Estimated Housing Expense 230 Other Obligations 230 Compensating Factors 230	Other Financial Considerations 275 Developing Statements of Operating Cash Flow 278 Case Example: Office Properties 279 Rent Premiums and Discounts for Office Space 279 Pro Forma Statement of Cash Flow—Office Properties 282 Case Example: Industrial and Warehouse Properties 283
The Underwriting Process Illustrated 232 Underwriting Standards—Conventional and Insured Conventional Mortgages 233 Underwriting Standards—FHA-Insured Mortgages 234 Underwriting Standards—VA-Guaranteed Mortgages 235 Underwriting and Loan Amounts—A Summary 237 The Closing Process 239	Pro Forma Statement of Cash Flow—Industrial/ Warehouse Properties 284 Case Example: Retail Properties 285 The Retail Leasing Environment 285 CAM Charges—Recoveries 287 Pro Forma Statement of Cash Flow—Retail Properties 288 Case Example: Apartment Properties 290
Fees and Expenses 239 Prorations, Escrow Costs, and Payments to Third Parties 240 Statutory Costs 242 Requirements under the Real Estate Settlement and	Chapter 10 Valuation of Income Properties: Appraisal and the Market for Capital 297 Introduction 297
Procedures Act (RESPA) 242 Settlement Costs Illustrated 244 Federal Truth-in-Lending (FTL) Requirements 246 Truth-in-Lending Sample Disclosure 247 Establishing the APR under Federal Truth-in-Lending Requirements 247 ARMs and Truth-in-Lending Disclosure 248	Valuation Fundamentals 297 Appraisal Process and Approaches to Valuation 298 Sales Comparison Approach 299 Income Approach 301 Capitalization Rate 303 Capitalization Rates—A Note of Caution 306 Discounted Cash Flow Techniques 307

Summary of Investment Analysis Calculations 370 Taxation of Income-Producing Real Estate 371 Taxable Income from Operation of Real Estate 372 Depreciation Allowances 372 Loan Points 374
Tax Liability and After-Tax Cash Flow 374
Taxable Income from Disposal of Depreciable Real
Property 374
After-Tax Investment Analysis 375 After-Tax Cash Flow from Operations 375
After-1ax Cash Flow from Operations 373 After-Tax Cash Flow from Sale 377
After-Tax Cash Flow from Sale 377 After-Tax IRR 377
Effective Tax Rate 378
A Note about Passive Losses 378
Special Exceptions to PAL Rules 380
Appendix A
Approaches to Metro Area Market Forecasting 384
Appendix B
RealNex Office Example 390
Realivez Office Example 390
Chamban 42
Chapter 12
Financial Leverage and Financing
Alternatives 398
Introduction to Financial Leverage 398
Conditions for Positive Leverage—Before Tax 399
Conditions for Positive Leverage—After Tax 403
Break-Even Interest Rate 405
Risk and Leverage 407
Underwriting Loans on Income Properties 409
Market Study and Appraisal 409
Borrower Financials 409
The Loan-to-Value Ratio 410
The Debt Coverage Ratio 410
Other Loan Terms and Mortgage Covenants 411
Alternatives to Fixed Rate Loan Structures 413
Participation Loans 414
Lender Motivations 414
Investor Motivations 415
Participation Example 415
Sale-Leaseback of the Land 419
Effective Cost of the Sale-Leaseback 421
Interest-Only Loans 421
Accrual Loans 423
Structuring the Payment for a Target Debt Coverage
Ratio 423
Convertible Mortgages 425
Lender's Yield on Convertible Mortgages 425
= =
Comparison of Financing Alternatives 427

Chapter 13 Risk Analysis 433	Renovation as an Alternative to Disposition 493 Renovation and Refinancing 496 Rehabilitation Investment Tax Credits 496
Introduction 433 Comparing Investment Returns 433	Low-Income Housing 498
Types of Risk 434	Chapter 15
Due Diligence in Real Estate Investment Risk	Financing Corporate Real Estate 503
Analysis 436	•
Sensitivity Analysis 436	Lease-versus-Own Analysis 504
Partitioning the IRR 440	Leasing versus Owning—An Example 504
Variation in Returns and Risk 441 Retail Case Study—Westgate Shopping Center 445	Cash Flow from Leasing 505 Cash Flow from Owning 505
Westgate Shopping Center Scenario Analysis 448	Cash Flow from Owning versus Leasing 507
Lease Rollover Risk 448	Return from Owning versus Leasing 507
Market Leasing Assumptions with Renewal	Importance of the Residual Value of Real Estate 508
Probabilities 450	The Investor's Perspective 510
Market Rent 450	A Note on Project Financing 511
Months Vacant 450	Factors Affecting Own-versus-Lease Decisions 512
Leasing Commissions 451	The Role of Real Estate in Corporate
Tenant Improvements 451	Restructuring 518
Industrial Case Study—Worthington Distribution	Sale-Leaseback 518
Center 451	Refinancing 521
Risk and Leverage 453	Investing in Real Estate for Diversification 521
Monte Carlo Simulation 456	Appendix
Example 458	Real Estate Asset Pricing and Capital Budget Analysis
Extensions of Monte Carlo Simulation 459	A Synthesis 524
Participation Example 459	
A "Real Options" Approach to Investment Decisions 461	PART FIVE
Traditional Approach to Land Valuation 462	FINANCING REAL ESTATE
Real Option Approach to Land Valuation 462	DEVELOPMENT
Real Options Extensions and Strategy 463	
	Chapter 16
Chapter 14	Financing Project Development 526
Disposition and Renovation of Income	Introduction 526
Properties 467	Overview: The Planning and Permitting Process 526
Disposition Decisions 467	The Development of Income-Producing Property 530
A Decision Rule for Property Disposition 468	Market Risks and Project Feasibility 531
IRR for Holding versus Sale of the Property 469	Project Risks 532
Return to a New Investor 472	Project Development Financing—An Overview 534
Marginal Rate of Return 472	Lender Requirements in Financing Project
Refinancing as an Alternative to Disposition 476	Development 535
Incremental Cost of Refinancing 476	Interest Rates and Fees 541
Leveraged Return from Refinancing and Holding an	Project Development Illustrated 541
Additional Five Years 477	Project Description and Project Costs 541
Refinancing at a Lower Interest Rate 479	Market Data and Tenant Mix 546
Other Disposition Considerations—Portfolio	Pro Forma Construction Costs and Cash Flow
Balancing 480	Projections 547
Tax-Deferral Strategies upon Disposition 480	Feasibility, Profitability, and Risk—Additional Issues 55
Installment Sales 481	Profitability before and after Taxes 551
Tax-Deferred Exchanges 486	Sensitivity Analysis, Risk, and Feasibility Analysis 555

Chapter 17 Financing Land Development Projects	561	Use of the Limited Partnership in Private and Public Syndicates 604
Characterization of the Land Development Business 561 The Land Development Process—An Overview Acquisition of Land—Use of the Option Contract Financing and Development 565 Lender Requirements in Financing Land Development 568 Detailed Cost Breakdowns 570 General Contracts and Subcontracts 570 Residential Land Development Illustrated 571 Market Conditions and Site Plan 572 Estimating Development Cost and Interest Carry Estimating Release Prices per Parcel Sold 582 Loan Request and Repayment Schedule 582 Project Feasibility and Profitability 583	563 563	Private Syndication Problem Illustrated 605 Financial Considerations—Partnership Agreement 606 Operating Projections 607 Statement of Before-Tax Cash Flow (BTCF) 608 Calculation of Net Income or Loss 608 Calculation of Capital Gain from Sale 609 Capital Accounts 609 Distribution of Cash from Sale of Asset 610 Calculation of After-Tax Cash Flow and ATIRR on Equity 611 Partnership Allocations and Substantial Economic Effect 613 Capital Accounts and Gain Charge-Backs 614 Use of the Limited Partnership in Private and Public
Project Feasibility and Profitability 383 Project IRR and Net Present Value 585 Entrepreneurial Profits 586 Sensitivity Analysis 587		Syndicates 616 Use of Corporate General Partners 617 Private versus Public Syndicates 617 Accredited Investors—Regulation D 618
PART SIX ALTERNATIVE REAL ESTATE FINANCING AND INVESTMENT VEHICLES		Regulation of Syndicates 622 Investment Objectives and Policies 623 Promoters' and Managers' Compensation 623 Investor Suitability Standards 624 Federal and State Securities Authorities 624
Chapter 18 Structuring Real Estate Investments: Organizational Forms and Joint Ventures 590		Chapter 19 The Secondary Mortgage Market: Pass-Through Securities 629 Introduction 629 Evolution of the Secondary Mortgage Market 629
Introduction 590 Sole Proprietorships 590 Partnerships 591 Limited Liability Companies 593 Corporations 594 Joint Ventures 595		Early Buyers of Mortgage Loans 630 The Secondary Market after 1954 630 FNMA's Changing Role 631 The Government National Mortgage Association 631 Mortgage-Backed Securities and the GNMA Payment Guarantee 632
Organizational Forms 596 Profit Sharing 596 Initial Capital Contributions 597 Sharing Cash Flow from Operations 597 Sharing of Cash Flow from Sale 598 Summary of Cash Flows Distributed in Each Operating Year 599 Cash Flow from Sale 601		The Federal Home Loan Mortgage Corporation 633 Operation of the Secondary Mortgage Market 633 Direct Sale Programs 634 The Development of Mortgage-Related Security Pools 634 Mortgage-Backed Bonds 635 Pricing Mortgage-Backed Bonds 636 Subsequent Prices 638
IRR to Each Joint Venture Party 601 Variation on the Preferred IRR—"The Lookback IRR" 602 Syndications 603		Mortgage Pass-Through Securities 639 Important Characteristics of Mortgage Pools 641 Mortgage Pass-Through Securities: A General Approach to Pricing 644

Mortgage Pass-Through Payment Mechanics	The Investment Appeal of Equity REITs 704
Illustrated 646	Public Nonlisted REITs 706
Prepayment Patterns and Security Prices 648	Importance of FFO (Funds from Operations) 709
Prepayment Assumptions 649	REIT Expansion and Growth 711
The Effects of Prepayment Illustrated 651	Important Issues in Accounting and Financial
Security Prices and Expected Yields 652	Disclosure: Equity REITs 715
Market Interest Rates and Price Behavior on Mortgage	Tenant Improvements and Free Rents: Effects
Pass-Throughs 653	on FFO 716
A Note on MBBs and MPTs 654	Leasing Commissions and Related Costs 716
	Use of Straight-Line Rents 717
Chapter 20	FFO and Income from Managing Other
The Secondary Mortgage Market:	Properties 717
CMOs and Derivative Securities 657	Types of Mortgage Debt and Other Obligations 718 Existence of Ground Leases 718
Introduction 657	Lease Renewal Options and REIT Rent Growth 718
Mortgage Pay-Through Bonds (MPTBs) 657	Occupancy Numbers: Leased Space or Occupied
Collateralized Mortgage Obligations 658	Space? 719
CMOs Illustrated 659	Retail REITs and Sales per Square Foot 719
CMO Mechanics 661	Additional Costs of Being a Public Company 720
CMOs: Pricing and Expected Maturities 667	The Investment Appeal of Mortgage REITs 720
CMO Price Behavior and Prepayment Rates 669	Financial Analysis of an Equity REIT Illustrated 722
CMO Tranche Variations 671	Valuing REITs as Investments 725
Subprime Mortgage-Backed Securities 672	Valuation of Midwestern America Property
Derivatives Illustrated 673	Trust 725
Yield Enhancement 676	
10 1 DO Ct 676	
IO and PO Strips 676	DADT SEVEN
Convexity 679	PART SEVEN
Convexity 679 Residential Mortgage-Related Securities: A	PORTFOLIO ANALYSIS AND REAL
Convexity 679 Residential Mortgage-Related Securities: A Summary 679	
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities:	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 REIT Data: Security Prices 733
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 REIT Data: Security Prices 733 Hybrid and Mortgage REITs 733 NCREIF Property Index: Property Values 734 Data Sources for Other Investments 735
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 REIT Data: Security Prices 733 Hybrid and Mortgage REITs 733 NCREIF Property Index: Property Values 734 Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695 Chapter 21	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 **REIT Data: Security Prices 733 **Hybrid and Mortgage REITs 733 **NCREIF Property Index: Property Values 734 **Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735 Computing Holding Period Returns 736
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695 Chapter 21 Real Estate Investment Trusts (REITs) 698 Introduction 698	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 **REIT Data: Security Prices 733 **Hybrid and Mortgage REITs 733 **NCREIF Property Index: Property Values 734 **Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735 Computing Holding Period Returns 736 **Comparing Investment Returns 738
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695 Chapter 21 Real Estate Investment Trusts (REITs) 698	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 REIT Data: Security Prices 733 Hybrid and Mortgage REITs 733 NCREIF Property Index: Property Values 734 Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735 Computing Holding Period Returns 736 Comparing Investment Returns 738
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695 Chapter 21 Real Estate Investment Trusts (REITs) 698 Introduction 698 Legal Requirements 698	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 REIT Data: Security Prices 733 Hybrid and Mortgage REITs 733 NCREIF Property Index: Property Values 734 Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735 Computing Holding Period Returns 736 Comparing Investment Returns 738 Risk, Return, and Performance Measurement 738
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695 Chapter 21 Real Estate Investment Trusts (REITs) 698 Introduction 698 Legal Requirements 698 Tax Treatment 702	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 REIT Data: Security Prices 733 Hybrid and Mortgage REITs 733 NCREIF Property Index: Property Values 734 Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735 Computing Holding Period Returns 736 Comparing Investment Returns 738 Risk, Return, and Performance Measurement 738 Risk-Adjusted Returns: Basic Elements 739
Convexity 679 Residential Mortgage-Related Securities: A Summary 679 Residential Mortgage-Related Securities: Some Closing Observations 681 Commercial Mortgage-Backed Securities (CMBSs) 682 Rating Commercial Mortgage-Backed Securities 685 Collateralized Debt Obligations (CDOs) 687 Mortgage-Related Securities and REMICs 690 REMICs: Other Considerations 691 Appendix Duration—An Additional Consideration in Yield Measurement 695 Chapter 21 Real Estate Investment Trusts (REITs) 698 Introduction 698 Legal Requirements 698 Tax Treatment 702 Violation Penalties and Status Termination 702	PORTFOLIO ANALYSIS AND REAL ESTATE FUNDS Chapter 22 Real Estate Investment Performance and Portfolio Considerations 732 Introduction 732 The Nature of Real Estate Investment Data 732 Sources of Data Used for Real Estate Performance Measurement 733 **REIT Data: Security Prices 733 **Hybrid and Mortgage REITs 733 **NCREIF Property Index: Property Values 734 **Data Sources for Other Investments 735 Cumulative Investment Return Patterns 735 Computing Holding Period Returns 736 **Comparing Investment Returns 738 Risk, Return, and Performance Measurement 738 **Risk-Adjusted Returns: Basic Elements 739 Elements of Portfolio Theory 740

Real Estate Returns, Other Investments, and the Potential for Portfolio Diversification 747

Portfolio Diversification: EREITs and Other Investments 747 Public versus Private Real Estate Investments 749 Real Estate Performance and Inflation 750 Diversification by Property Type and Location 750 Global Diversification 753 Risks of Global Investment 754 Use of Derivatives to Hedge Portfolio Risk 756

Chapter 23

Real Estate Investment Funds: Structure, Performance, Benchmarking, and Attribution Analysis 761

Example—Swap Office for Retail 757

Up Shares and Down Shares 757

Investor Goals and Objectives 763 General Explanation of Possible Provisions in Fund Offerings 763

Reporting Fund Performance 771

Measuring and Reporting Investment Returns 771

Summary of Major Activity during Quarter 772

Calculating Returns 774

Calculating Returns at the Property Level 776 Comparing Returns: Fund Level versus Property Level 777

Returns: Before and After Fees 778
Calculating Historical Returns 778
Time-Weighted Returns 779

Choosing IRR versus TWR for Performance Measurement 782

Target Returns and Benchmarks 783
Investment Multiple 784
Attribution Analysis 785
Attribution Analysis Mathematics 787
Interpreting Sector Allocation 788
Evaluating Risk Differences 790
Jensen's Alpha 794

INDEXES 800