CONTENTS

PREFACE	vii	
---------	-----	--

ABOUT THE AUTHOR

CHAPTER 1	DIFFERENCE EQUATIONS	
-----------	----------------------	--

Introd	luction	1

- Time-Series Models 1
- Difference Equations and Their Solutions 7
- Solution by Iteration 10
- 4 An Alternative Solution Methodology 14
- 5 The Cobweb Model 18
- 6 Solving Homogeneous Difference Equations 22
- Particular Solutions for Deterministic Processes 31
- The Method of Undetermined Coefficients
- 9 Lag Operators 40
- 10 Summary 43
 - Ouestions and Exercises 44

CHAPTER 2 STATIONARY TIME-SERIES MODELS 47

- Stochastic Difference Equation Models 47
- ARMA Models 50
- Stationarity 51
- Stationarity Restrictions for an ARMA (p, q) Model **55**
- The Autocorrelation Function 60
- 6 The Partial Autocorrelation Function 64
- Sample Autocorrelations of Stationary Series 67
- 8 Box-Jenkins Model Selection
- 9 Properties of Forecasts 79
- 10 A Model of the Interest Rate Spread 88
- 11 Seasonality 96
- 12 Parameter Instability and Structural Change
- 13 Combining Forecasts 109
- 14 Summary and Conclusions 112 Questions and Exercises 113

MODELING VOLATILITY 118 **CHAPTER 3**

- Economic Time Series: The Stylized Facts 118
- ARCH and GARCH Processes 123
- ARCH and GARCH Estimates of Inflation 130
- Three Examples of GARCH Models 134
- A GARCH Model of Risk 141
- The ARCH-M Model 143
- Additional Properties of GARCH Processes 146
- Maximum Likelihood Estimation of GARCH Models 152
- Other Models of Conditional Variance 154
- Estimating the NYSE U.S. 100 Index 158
- Multivariate GARCH 165
- Volatility Impulse Responses 172
- Summary and Conclusions 174 Questions and Exercises 176

MODELS WITH TREND 181 **CHAPTER 4**

- Deterministic and Stochastic Trends 181
- 2 Removing the Trend 189
- 3 Unit Roots and Regression Residuals 195
- 4 The Monte Carlo Method 200
- 5 Dickey-Fuller Tests 206
- 6 Examples of the Dickey-Fuller Test 210
- Extensions of the Dickey-Fuller Test 215
- Structural Change 227
- Power and the Deterministic Regressors
- 10 Tests with More Power 238
- Panel Unit Root Tests 243
- 12 Trends and Univariate Decompositions 247
- 13 Summary and Conclusions 254 Questions and Exercises 255

CHAPTER 5 MULTIEQUATION TIME-SERIES MODELS 259

- Intervention Analysis 261
- ADLs and Transfer Functions 267
- An ADL of Terrorism in Italy 277
- Limits to Structural Multivariate Estimation
- Introduction to VAR Analysis 285 Estimation and Identification 290
- The Impulse Response Function 294
- Testing Hypotheses 303
- Example of a Simple VAR: Domestic and Transnational Terrorism
- Structural VARs 313
- Examples of Structural Decompositions 317
- 12 Overidentified Systems

The Blanchard-Quah Decomposition 325

Decomposing Real and Nominal Exchange Rates: An Example

331

13

IN

ENDNOTES (ONLINE)

STATISTICAL TABLES (ONLINE)

15	Summary and Conclusions 335 Questions and Exercises 337	
СНА	PTER 6 COINTEGRATION AND ERROR-CORRECTION MODELS 34:	3
1	Linear Combinations of Integrated Variables 344 34 350 360 344 350 360 360 360 360 360 360 360 360 360 36	
2	Cointegration and Common Trends 351 351 351 351 351 351 351 351 351 351	
3	Cointegration and Error Correction 353	
4	Testing for Cointegration: The Engle-Granger Methodology 360	
5	Illustrating the Engle-Granger Methodology 364	
6	Cointegration and Purchasing Power Parity 370 370 400 400 400 400 400 400 400 400 400 4	
7	Characteristic Roots, Rank, and Cointegration 373	
8	Hypothesis Testing 380	
9	Illustrating the Johansen Methodology 389	
10	Error-Correction and ADL Tests 393	
11	Comparing the Three Methods 397	
12	Summary and Conclusions 400	
	Questions and Exercises 401 September 1 September 1 September 1 September 2 Se	
CHA	PTER 7 NONLINEAR MODELS AND BREAKS 407	
1	Linear Versus Nonlinear Adjustment 408	ì
2	Simple Extensions of the ARMA Model 410	
3	Testing for Nonlinearity 413	
4	Threshold Autoregressive Models 420	
5	Extensions of the TAR Model 427	
6	Three Threshold Models 433	
7	Smooth Transition Models 439	
8	Other Regime Switching Models 445	
9	Estimates of STAR Models 449	
10	Generalized Impulse Responses and Forecasting 453	
11	Unit Roots and Nonlinearity 461	
12	More on Endogenous Structural Breaks 466	
13	Summary and Conclusions 474	
	Questions and Exercises 475	
INDE	EX 479	
IIIDL		
DEE	Introduction to VAR Analysis 285	
KEFI	ERENCES (ONLINE)	