Econometric Sourcebook

Betty J. Blecha

San Francisco State University



Wadsworth Publishing Company Belmont, California A Division of Wadsworth, Inc.



Contents

Instructor's Preface vii

Lesson 1 Estimators and the Random Error Term 1

Consumption Function Model 1 Estimating a Consumption Function 2 *Lesson Note 1.1* Did Monetary Forces or Spending Forces Cause the Great Depression? 6 Estimators and Estimates 7 *Lesson Note 1.2* Evaluating the Econometric Evaluations of Training Programs with Experimental Data 8 Justification for the Random Error Term 15

Lesson 2 Expected Values 18

Rules of Summation 18 Sigma Notation 18 Three Rules of Summation 20 Means, Variances, and Covariances 22 Double Sigmas 28 Algebra of Expectations 30 Expected-Value Rules 30 Variances and Covariances 33

Lesson 3 Specifying a Model 36

Specifying a Model 36 Keynes and the Consumption Function 39 Problems with the Simple Consumption Function 42 Lesson Note 3.1 Using the Survey of Current Business 45

Lesson 4 Single-Equation Models 51

Transforming Variables 51 Inflation and Money Supply Growth 52 *Lesson Note 4.1* A Comment on Statistical Significance 55 Productivity and GNP 56 *Lesson Note 4.2* Using the *Business Conditions Digest* 60 Suggested Reading 65

Lesson 5 More Single-Equation Models 66

Okun's Law 66 Fixed Business Investment 70 The Demand for New Autos 71 *Lesson Note 5.1* Some Issues in Measuring Inflation 73 *Lesson Note 5.2* Different Base Periods for Price Indices 76 Suggested Reading 77

Lesson 6

Making Nonlinear Functions Linear 78

Logarithms 78 Three Rules of Logarithms 79 Exponential Function 80 Double-Logarithmic Function 83 Reciprocal Function 86 Polynomial Function 87 Logistic Function 89 Lesson Note 6.1 Hybrid Corn and the Economics of Innovation 91 Suggested Reading 95

Lesson 7 Parameter Constraints 96

A Simple Constraint 97 Testing Hypotheses About Constraints 98 Conceptual Difficulties in Estimating Production Functions 103 Specification Search 105 *Lesson Note 7.1* The Six Varieties of Specification Searches 106 Suggested Reading 108

Lesson 8 Dummy Variables 109

Seasonal Adjustment with Dummy Variables 110 Decomposition Method 114 *Lesson Note 8.1* Seasonal Variations Seen Causing Big Swings in Economic Statistics 117 Suggested Reading 119

Lesson 9 Heteroscedasticity 120

inclusticity 120

Residuals as an Information Source 121 Causes and Problems 123 What Causes Heteroscedasticity? 123 Why Is Heteroscedasticity a Problem? 123 Treatment 126

Lesson 10

```
Autocorrelation 132
```

Interest-Rate Model 132 Lesson Note 10.1 Measuring the Money Supply 134 Causes and Problems 140 Treatment 143

Lesson 11 Geometric Lags I 147

General Distributed Lag Model 147 Geometric Function 150 Partial Adjustment Behavior 152 Adaptive Expectations Behavior 155 *Lesson Note 11.1* Price Expectations and Core Inflation 158

Lesson 12 Geometric Lags II 161

Consumption Function 161 Permanent Income and Consumer Durables 167

Lesson 13 Polynomial Lags 170

Lesson Note 13.1 The J-Curve 171 Estimating a Polynomial Lag Structure 173 How Lag Parameters Are Generated 173 Estimation Procedure 174 Restrictions 175 Investment Functions in Differenced Form 177 Suggested Reading 179

Lesson 14 Simultaneous Equations 180

Solving a Simultaneous Model 181 Graphical Analysis 181 Algebraic Solution 185 New Estimator Criterion 190 Suggested Reading 202

Lesson 15

Econometric Case Study: The Phillips Curve 203

Natural-Rate Hypothesis 204 The Beginnings 204 Testing the Natural-Rate Hypothesis 208 Lesson Note 15.1 Using the Journal of Economic Literature 210 The Rational Expectations Challenge 214

Data Bank 216

Notes 223

0