Contents

Series Foreword / xiii

Kathleen S. Crittenden

Preface / xv

What Sort of Book Is This? / xv
Who Is This Book For? / xv
How Is This Book Organized? / xvi
What Do I Need to Know to Be Able
to Understand This Book? / xvi
How Should I Read This Book? / xvii
Where Can I Learn More? / xvii
Where Can I Get the Data? / xviii
Acknowledgments / xviii

1 What Is Multiple Regression? / 1

- 1.1. What Is Multiple Regression? / 1
- 1.2. What Is Multiple Regression Good For? / 1
- 1.3. Are There Other Names for Multiple Regression? / 2
- 1.4. Why Is Multiple Regression So Popular? / 3
- 1.5. Why Is Regression "Linear"? / 3
- 1.6. What Does a Linear Equation Look Like With More Than Two Variables? / 5
- 1.7. Why Does Multiple Regression Use Linear Equations? / 6
- 1.8. What Kinds of Data Are Needed for Multiple Regression? / 7
- 1.9. What Kinds of Variables Can Be Used in Multiple Regression? / 9

- 1.10. What Is Ordinary Least Squares? / 10
- 1.11. How Can We Judge How Good the Predictions Are? / 13
- 1.12. How Do We Judge How Good the Coefficient Estimates Are? / 14
- 1.13. How Does Multiple Regression "Control" for Variables? / 16
- 1.14. Is Multiple Regression as Good as an Experiment? / 20

Chapter Highlights / 22

Questions to Think About / 22

2 How Do I Interpret Multiple Regression Results? / 25

- 2.1. How Does Education Promote Better Health? / 25
- 2.2. Do Mental Patients Who Believe
 That People Discriminate Against Them
 Suffer Greater Demoralization? / 31
- 2.3. Are People in Cities

 More Racially Tolerant? / 34
- 2.4. What Determines How Much Time Married Couples Spend Together? / 37
- 2.5. Do Male Workers Dislike Working With Women? / 40

Chapter Highlights / 45

Questions to Think About / 46

3 What Can Go Wrong With Multiple Regression? / 49

- 3.1. Are Important Independent Variables
 Left Out of the Model? / 49
- 3.2. Does the Dependent Variable Affect Any of the Independent Variables? / 52
- 3.3. How Well Are the Independent Variables Measured? / 55
- 3.4. Is the Sample Large Enough to Detect Important Effects? / 57
- 3.5. Is the Sample So Large That
 Trivial Effects Are Statistically Significant? / 58

3.6. E	o Some	Variable	es Mediate	•
the E	ffects of	Other V	ariables?	60 /

- 3.7. Are Some Independent Variables Too Highly Correlated? / 62
- 3.8. Is the Sample Biased? / 64
- 3.9. Are There Any Other Problems to Watch For? / 65 Chapter Highlights / 66 Ouestions to Think About / 68

4 How Do I Run a Multiple Regression? / 71

- 4.1. How Do I Choose a Computer Package? / 71
- 4.2. How Do I Get My Data Into the Computer Package? / 73
- 4.3. What Else Should I Do Before Running the Multiple Regression? / 78
- 4.4. How Do I Indicate Which Regression Model I Want to Run? / 81
- 4.5. How Do I Interpret Computer Output? / 82
- 4.6. What Are the Common Options in Regression Packages? / 84

Chapter Highlights / 93 Project / 94

5 How Does Bivariate Regression Work? / 97

- 5.1. How Do We Picture the Least Squares Regression Problem? / 97
- 5.2. How Is the Least Squares
 Regression Line Calculated? / 99
- 5.3. How Is Regression Related to Correlation? / 104
- 5.4. How Is the Standard Error Calculated? / 106
- 5.5. How Is Bivariate Regression Related to Trivariate Regression? / 108
- 5.6. Why Are There Two Bivariate Regression Lines? / 112

Chapter Highlights / 114
Questions to Think About / 115

6 What Are the Assumptions of Multiple Regression? / 119

- 6.1. How Should We Assess the Performance of a Statistical Technique? / 120
- 6.2. What Is the Probability Sampling Model? / 121
- 6.3. What Is the Standard Linear Model? / 122
- 6.4. What Does the Linearity Assumption Mean? / 123
- 6.5. What Is Mean Independence? / 124
- 6.6. What Is Homoscedasticity? / 125
- 6.7. What Are Uncorrelated Disturbances? / 128
- 6.8. What Is the Normality Assumption? / 130
- 6.9. Are There Any Other Assumptions for Multiple Regression? / 131

Chapter Highlights / 132

Questions to Think About / 134

7 What Can Be Done About Multicollinearity? / 137

- 7.1. What Is Extreme Multicollinearity? / 137
- 7.2. What Is Near-Extreme Multicollinearity? / 140
- 7.3. How Can Multicollinearity Be Diagnosed? / 140
- 7.4. What Are the Consequences of Multicollinearity? / 142
- 7.5. Are There Situations in Which
 Multicollinearity Is More Likely to Occur? / 145
- 7.6. Are There Any Solutions? / 147

Chapter Highlights / 149

Questions to Think About / 150

8 How Can Multiple Regression Handle Nonlinear Relationships? / 153

- 8.1. How Can a Linear Model Represent Nonlinear Relationships? / 153
- 8.2. What Transformations Are Used on the Dependent Variable? / 154
- 8.3. What Transformations Are Used for the Independent Variables? / 156
- 8.4. How Can I Check for Nonlinearity? / 160

- 8.5. How Can Dummy Variables Help With Nonlinearity? / 162
- 8.6. What Is Interaction? / 166
- 8.7. How Do I Interpret Interactions With Dummy Variables? / 169

Chapter Highlights / 170

Questions to Think About / 173

9 How Is Multiple Regression Related to Other Statistical Techniques? / 175

- 9.1. How Is Regression Related to Correlation? / 175
- 9.2. How Is Regression Related to the *t* Test for a Difference Between Means? / 176
- 9.3. What Is Analysis of Variance? / 176
- 9.4. What Is Analysis of Covariance? / 176
- 9.5. What Is Path Analysis? / 177
- 9.6. What Are Simultaneous Equation Models? / 178
- 9.7. What Is Factor Analysis? / 179
- 9.8. What Are Structural Equation Models? / 180
- 9.9. What Are Multilevel Models? / 181
- 9.10. What Is Nonlinear Regression? / 183
- 9.11. What Is Logit Analysis? / 184
- 9.12. What Is Event History Analysis? / 185

Chapter Highlights / 186

Answers to Questions to Think About / 189

References / 195

Index / 197