

CONTENTS

PART I. THE MULTIPLE LINEAR REGRESSION	19
0. Initial concepts	21
0.1 Definition	21
0.2 The data.....	22
0.3 The model	23
0.4 Linearity	25
0.5 Basic properties and definitions	27
1. The Multiple Linear Regression.....	31
1.1 Introduction.....	31
1.2 Hypotheses.....	33
1.3 OLS Estimator	35
1.4 Properties of the OLS Estimator	38
1.5 Coefficient of determination	41
1.6 Maximum Likelihood Estimator	44
1.7 Scale changes and Origin changes.....	46
1.8 Specification errors	52
2. Inference.....	57
2.1 Introduction.....	57
2.2 Hypothesis test over a model coefficient.....	60
2.3 Hypothesis test for more than one coefficient.....	65
2.4 Linear hypothesis	70
2.5 Structural change test: the Chow test	71

3. Validation and prediction	75
4. Dummy variables	81
4.1 Introduction.....	82
4.2 Modeling with Dummy Variables.....	84
5. Heteroskedasticity.....	95
5.1 Introduction.....	95
5.2 Causes of the heteroskedasticity	98
5.3 The WLS with heteroskedasticity	102
5.4 Heteroskedasticity tests	105
5.5 Prediction with heteroskedasticity.....	113
6. Autocorrelation	117
6.1 Introduction.....	117
6.2 Causes of autocorrelation.....	119
6.3 Consequences of autocorrelation	122
6.4 Autocorrelation tests	125
6.5 Model estimation with autocorrelation.....	131
7. Multicollinearity.....	133
7.1 Introduction.....	133
7.2 Types of multicollinearity	135
PART II. WORKSHOPS	139
0. Software and data.....	141
1. Estimation of the MLR	143
1.1 Estimate a model using OLS.....	143
1.2 Elasticities	148
1.3 Scale change and origin change.....	149
2. Hypothesis tests.....	153
2.1 Individual significance tests	153
2.2 Joint significance test	157

2.3 Linear hypothesis	158
2.4 Chow test.....	159
3. Punctual and Interval prediction	163
3.1 Forecasts.....	164
4. Dummy variables	171
4.1 Estimation.....	171
4.2 Structural change	173
4.3 Interpretation	175
5. Heteroscedasticity.....	179
5.1 Tests	180
5.2 Detection.....	181
5.3 Correction	184
6. Autocorrelation	193
6.1 Identification	195
6.2 Estimation.....	197
6.3 Correction	203
7. Multicollinearity.....	207
7.1 Detection.....	208
7.2 Correction	210
 PART III. APPENDICES	 215
A. The logarithmic model	217
B. Probability tables	221
C. Formulary	235
 BIBLIOGRAPHY	 237