

Contents

Part I Forecasting Models

1 Multivariate Regression	3
1.1 The Assumptions Underlying Regression	4
1.1.1 Multicollinearity	4
1.1.2 Homoscedasticity of the Residuals	5
1.1.3 Normality of the Residuals	8
1.1.4 Independence of the Residuals	8
1.2 Selecting the Regression Equation	11
1.3 Multivariate Regression in IBM SPSS Statistics	12
1.4 The Cochrane-Orcutt Procedure for Tackling Autocorrelation	19
2 Other Useful Topics in Regression	27
2.1 Binary Logistic Regression	28
2.1.1 The Linear Probability Model (LPM)	28
2.1.2 The Logit Model	31
2.1.3 Applying the Logit Model	32
2.1.4 The Logistic Model in IBM SPSS Statistics	33
2.1.5 A Financial Application of the Logistic Model	39
2.2 Multinomial Logistic Regression	40
2.3 Dummy Regression	40
2.4 Functional Forms of Regression Models	47
2.4.1 The Power Model	49
2.4.2 The Reciprocal Model	52
2.4.3 The Linear Trend Model	55
3 The Box-Jenkins Methodology	59
3.1 The Property of Stationarity	59
3.1.1 Trend Differencing	60
3.1.2 Seasonal Differencing	62

3.1.3	Homoscedasticity of the Data	63
3.1.4	Producing a Stationary Time Series in IBM SPSS Statistics	63
3.2	The ARIMA Model	66
3.3	Autocorrelation	67
3.3.1	ACF	67
3.3.2	PACF	70
3.3.3	Patterns of the ACF and PACF	71
3.3.4	Applying an ARIMA Model	71
3.4	ARIMA Models in IBM SPSS Statistics	74
4	Exponential Smoothing and Naïve Models	81
4.1	Exponential Smoothing Models	81
4.2	The Naïve Models	88

Part II Multivariate Methods

5	Factor Analysis	97
5.1	The Correlation Matrix	98
5.2	The Terminology and Logic of Factor Analysis	98
5.3	Rotation and the Naming of Factors	102
5.4	Factor Scores in IBM SPSS Statistics	105
6	Discriminant Analysis	107
6.1	The Methodology of Discriminant Analysis	107
6.2	Discriminant Analysis in IBM SPSS Statistics	108
6.3	Results of Applying the IBM SPSS Discriminant Procedure	110
7	Multidimension Scaling (MDS)	117
7.1	Types of MDS Model and Rationale of MDS	119
7.2	Methods for Obtaining Proximities	120
7.3	The Basics of MDS in IBM SPSS Statistics: Flying Mileages	121
7.4	An Example of Nonmetric MDS in IBM SPSS Statistics: Perceptions of Car Models	126
7.5	Methods of Computing Proximities	127
7.6	Weighted Multidimensional Scaling in IBM SPSS, INDSCAL	130
8	Hierarchical Log-linear Analysis	135
8.1	The Logic and Terminology of Log-linear Analysis	135
8.2	IBM SPSS Statistics Commands for the Saturated Model	138
8.3	The Independence Model	142
8.4	Hierarchical Models	144
8.5	Backward Elimination	148

Part III Research Methods

9 Testing for Dependence	153
9.1 Introduction	153
9.2 Chi-Square in IBM SPSS Statistics	155
10 Testing for Differences Between Groups	159
10.1 Introduction	159
10.2 Testing for Population Normality and Equal Variances	160
10.3 The One-Way Analysis of Variance (ANOVA)	162
10.4 The Kruskal-Wallis Test	164
11 Current and Constant Prices	167
11.1 HICP and RPI	167
11.2 Current and Constant Prices	168
References	173
Index	175