

# Contents

<i>List of figures</i>	<i>page</i>	v
<i>List of tables</i>	<i>page</i>	vi
<i>Preface</i>	<i>page</i>	ix
1 Introduction	1	
1.1 The role of the logit model	1	
1.2 Plan of the book and further reading	2	
1.3 Program packages and a data set	4	
1.4 Notation	6	
2 The binary model	9	
2.1 The logit model for a single attribute	9	
2.2 Justification of the model	16	
2.3 The latent regression equation; probit and logit	20	
2.4 Applications	26	
3 Maximum likelihood estimation of the binary logit model	33	
3.1 Principles of maximum likelihood estimation	33	
3.2 Sampling considerations	38	
3.3 Estimation of the binary logit model	40	
3.4 Consequences of a binary covariate	45	
3.5 Estimation from categorical data	47	
3.6 Private car ownership and household income	50	
3.7 Further analysis of private car ownership	54	
4 Some statistical tests and measures of fit	56	
4.1 Statistical tests in maximum likelihood theory	56	
4.2 The case of categorical covariates	58	
4.3 The Hosmer–Lemeshow test	62	
4.4 Some measures of fit	66	
5 Outliers, misclassification of outcomes, and omitted variables	73	
5.1 Detection of outliers	73	

5.2	Misclassification of outcomes	76
5.3	The effect of omitted variables	79
6	Analyses of separate samples	88
6.1	A link with discriminant analysis	88
6.2	One-sided sample reduction	92
6.3	State-dependent sampling	97
6.4	Case-control studies	99
7	The standard multinomial logit model	104
7.1	Ordered probability models	104
7.2	The standard multinomial logit model	106
7.3	ML estimation of multinomial models: generalities	110
7.4	Estimation of the standard multinomial logit	113
7.5	Multinomial analysis of private car ownership	117
7.6	A test for pooling states	122
8	Discrete choice or random utility models	126
8.1	The general logit model	126
8.2	McFadden's model of random utility maximization	130
8.3	The conditional logit model	135
8.4	Choice of a mode of payment	140
8.5	Models with correlated disturbances	144
9	The origins and development of the logit model	149
9.1	The origins of the logistic function	149
9.2	The invention of probit and the advent of logit	152
9.3	Other derivations	156
	<i>Bibliography</i>	158
	<i>Index of authors</i>	166
	<i>Index of subjects</i>	168