

Contents

I	Remarks on Inference in Economics	1
1.1	The Unity of Science	1
1.2	Deductive Inference	2
1.3	Inductive Inference	4
1.4	Reductive Inference	5
1.5	Jeffreys' Rules for a Theory of Inductive Inference	7
1.6	Implications of the Rules	8
	Questions and Problems	12
II	Principles of Bayesian Analysis with Selected Applications	13
2.1	Bayes' Theorem	13
2.2	Bayes' Theorem and Several Sets of Data	17
2.3	Prior Probability Density Functions	18
2.4	Marginal and Conditional Posterior Distributions for Parameters	21
2.5	Point Estimates for Parameters	24
2.6	Bayesian Intervals and Regions for Parameters	27
2.7	Marginal Distribution of the Observations	28
2.8	Predictive Probability Density Functions	29
2.9	Point Prediction	30
2.10	Prediction Regions and Intervals	31
2.11	Some Large Sample Properties of Bayesian Posterior Pdf's	31
2.12	Application of Principles to Analysis of the Pareto Distribution	34
2.13	Application of Principles to Analysis of the Binomial Distribution	38

2.14	Reporting the Results of Bayesian Analyses	40
	Appendix	41
	Questions and Problems	54
III	The Univariate Normal Linear Regression Model	58
3.1	The Simple Univariate Normal Linear Regression Model	58
3.1.1	Model and Likelihood Function	58
3.1.2	Posterior Pdf's for Parameters with a Diffuse Prior Pdf	60
3.1.3	Application to Analysis of the Investment Multiplier	63
3.2	The Normal Multiple Regression Model	65
3.2.1	Model and Likelihood Function	65
3.2.2	Posterior Pdf's for Parameters with a Diffuse Prior Pdf	66
3.2.3	Posterior Pdf Based on an Informative Prior Pdf	70
3.2.4	Predictive Pdf	72
3.2.5	Analysis of Model when $X'X$ is Singular	75
	Questions and Problems	82
IV	Special Problems in Regression Analysis	86
4.1	The Regression Model with Autocorrelated Errors	86
4.2	Regressions with Unequal Variances	98
4.3	Two Regressions with Some Common Coefficients	108
	Appendix 1	110
	Appendix 2	110
	Questions and Problems	112
V	On Errors in the Variables	114
5.1	The Classical EVM: Preliminary Problems	114
5.2	Classical EVM: ML Analysis of the Functional Form	123
5.3	ML Analysis of Structural Form of the EVM	127

5.4	Bayesian Analysis of the Functional Form of the EVM	132
5.5	Bayesian Analysis of the Structural Form of the EVM	145
5.6	Alternative Assumption about the Incidental Parameters	145
	Appendix	154
	Questions and Problems	157
VI	Analysis of Single Equation Nonlinear Models	162
6.1	The Box-Cox Analysis of Transformations	162
6.2	Constant Elasticity of Substitution (CES) Production Function	169
6.3	Generalized Production Functions	176
	Questions and Problems	183
VII	Time Series Models: Some Selected Examples	186
7.1	First Order Normal Autoregressive Process	186
7.2	First Order Autoregressive Model with Incomplete Data	191
7.3	Analysis of a Second Order Autoregressive Process	194
7.4	“Distributed Lag” Models	200
7.5	Applications to Consumption Function Estimation	207
7.6	Some Generalizations of the Distributed Lag Model	213
	Appendix	216
	Questions and Problems	220
VIII	Multivariate Regression Models	224
8.1	The Traditional Multivariate Regression Model	224
8.2	Predictive Pdf for the Traditional Multivariate Regression Model	233
8.3	The Traditional Multivariate Model with Exact Restrictions	236
8.4	Traditional Model with an Informative Prior Pdf	238
8.5	The “Seemingly Unrelated” Regression Model	240
	Questions and Problems	246

IX	Simultaneous Equation Econometric Models	248
9.1	Fully Recursive Models	250
9.2	General Triangular Systems	252
9.3	The Concept of Identification in Bayesian Analysis	253
9.4	Analysis of Particular Simultaneous Equation Models	258
9.5	“Limited Information” Bayesian Analysis	265
9.6	Full System Analysis	270
9.7	Results of Some Monte Carlo Experiments	276
9.7.1	The Model and Its Specifications	277
9.7.2	Sampling-Theory Analysis of the Model	278
9.7.3	Bayesian Analysis of the Model	278
9.7.4	Experimental Results: Point Estimates	280
9.7.5	Experimental Results: Confidence Intervals	286
9.7.6	Concluding Remarks on the Monte Carlo Experiments	286
	Questions and Problems	287
X	On Comparing and Testing Hypotheses	291
10.1	Posterior Probabilities Associated with Hypotheses	292
10.2	Analyzing Hypotheses with Diffuse Prior Pdf's for Parameters	298
10.3	Comparing and Testing Hypotheses with Nondiffuse Prior Information	302
10.4	Comparing Regression Models	306
10.5	Comparing Distributed Lag Models	312
	Questions and Problems	317
XI	Analysis of Some Control Problems	319
11.1	Some Simple One Period Control Problems	320
11.2	Single-Period Control of Multiple Regression Processes	327
11.3	Control of Multivariate Normal Regression Processes	331
11.4	Sensitivity of Control to Form of Loss Function	333
11.5	Two-Period Control of the Multiple Regression Model	336
11.6	Some Multiperiod Control Problems	344
	Appendix 1	354
	Appendix 2	356
	Questions and Problems	358

XII	Conclusion	360
	Appendix A	363
	Appendix B	379
	Appendix C	400
	Bibliography	415
	Author Index	423
	Subject Index	427