ECONOMETRIC TOOLS

Daniel McFadden ©1998
Department of Economics
University of California
Berkeley, CA 94720-3880
(mcfadden@econ.berkeley.edu)

PRELIMINARY VERSION, COMMENTS AND CORRECTIONS WELCOME

Chapter	TABLE OF CONTENTS	Page
1 1.1 1.2 1.3 1.4	Economic Analysis and Econometrics Introduction Petit Verdot's Rational Decision Stock Market Efficiency The Capital Asset Pricing Model	1 1 5 9
2 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 2.12 2.13 2.14	Analysis and Linear Algebra in a Nutshell Some Elements of Mathematical Analysis Vectors and Linear Spaces Linear Transformations and Matrices Eigenvalues and Eigenvectors Partitioned Matrices Quadratic Forms LDU and Cholesky Factorizations of a Matrix Singular Value Decomposition of a Matrix Projections and Idempotent Matrices Generalized Inverses Kronecker Products Shaping Operations Vector and Matrix Derivatives Updating and Backdating Matrix Operations	18 18 22 25 30 32 33 34 38 39 41 43 44 45 47
3.1 3.2 3.3 3.4 3.5	Probability Theory in a Nutshell Sample Spaces Event Fields and Information Probability Statistical Independence and Repeated Trials Random Variables, Distribution Functions, and Expectations	50 50 50 54 60 66
3.6 3.7	Transformations of Random Variables Special Distributions	81 86
4 4.1 4.2 4.3 4.4	Limit Theorems in Statistics Sequences of Random Variables Laws of large Numbers Central Limit Theorems Extensions of Limit Theorems	93 93 105 107 110
5 5.1 5.2 5.3 5.4	Experiments, Sampling, and Statistical Decisions Experiments Populations and Samples Statistical Decisions Statistical Inference	119 119 121 126 134
6 6.1 6.2 6.3 6.4	Estimation Desirable Properties of Estimators General Estimation Criteria Estimation in Normally Distributed Populations Large Sample Properties of Maximum Likelihood Estimators	135 135 147 149 154