

CONTENTS OF VOLUME 1

Introduction to the Series	v
Preface	vii
Introduction	xix
Part I. Duality of Production, Cost, and Profit Functions	1
I.1 Daniel McFadden: Cost, Revenue, and Profit Functions	3
1. Introduction	3
<i>Part I. Cost Functions</i>	5
2. History	5
3. Production technologies	5
4. The cost function	10
5. The derivative property	14
6. Duality	19
7. Distance functions and economic transformation functions	24
8. Extensions of duality	29
9. Cobb–Douglas and C.E.S. cost functions	38
10. The geometry of two-input cost functions	39
11. Comparative statics for the cost minimizing firm	46
12. Composition of distance and cost functions	49
<i>Part II. Restricted Profit Functions</i>	60
13. The general representation of production possibilities	60
14. The general restricted profit function	66
15. The derivative property of the restricted profit function	74
16. The gauge function for production possibilities	76
17. Duality for the restricted profit function	81
18. Examples of restricted profit functions	93
19. Composition rules for profit functions	95
20. Profit saddle-functions	101

I.2 Giora Hanoch: Symmetric Duality and Polar Production Functions	111
1. Introduction	111
2. A symmetric formulation of cost and production functions	112
3. Polar production and cost functions	118
4. A symmetric formulation of profit functions and production frontiers	121
5. The polar profit and production functions	126
6. Some extensions and an application	129
I.3 Lawrence J. Lau: Applications of Profit Functions	133
1. The profit function – An alternative derivation	133
2. The structure of normalized profit functions	151
3. Extensions to multiple outputs	169
4. Examples of normalized profit functions	190
5. Applications of the normalized profit function	197
6. Summary and conclusions	215
Part II. Functional Forms in Production Theory	217
II.1 Melvyn Fuss, Daniel McFadden, and Yair Mundlak: A Survey of Functional Forms in the Economic Analysis of Production	219
1. The context and objectives of production analysis	219
2. Criteria for the design of functional forms	222
3. Dual transformation, cost and profit functions – Maintained hypotheses on the technology and its representations	225
4. A general approach – Forms linear-in-parameters	230
5. Special non-linear forms	240
6. Separability: Functional implications and tests	244
7. Econometric estimation of production parameters	249
8. Overview of empirical analysis	267
9. Conclusion	268

II.2 Daniel McFadden: The General Linear Profit Function	269
1. Introduction	269
2. The basic model	270
3. General linear profit functions	272
4. The dual technology of the general linear profit function	281
5. Applications of the linear profit function	283
II.3 Giora Hanoch: Polar Functions with Constant Two Factors – One Price Elasticities	287
1. Introduction	287
2. Elasticities of substitution and transformation	289
3. A summary of DRES and CDE (implicitly additive) models	294
4. Multiproduct production frontiers with constant TOES or TOET	301
II.4 Melvyn Fuss and Daniel McFadden: Flexibility versus Efficiency in <i>Ex Ante</i> Plant Design	311
1. Introduction	311
2. Historical background	313
3. A model of the firm with an <i>ex ante-ex post</i> technology	320
4. Functional forms for the <i>ex ante-ex post</i> production structures	330
5. Derivation of the two-level structure of technology	345
6. Separable technology across states	356
7. A general linear-in-parameters <i>ex ante-ex post</i> technology	359
8. Concluding remarks	363
Appendices	365
A.1 Daniel McFadden: Definite Quadratic Forms Subject to Constraints	365
1. Conditions for a matrix to be positive definite	365
2. Conditions for a matrix to be positive definite subject to constraint	368

A.2 Daniel McFadden: Necessary and Sufficient Conditions for the Classical Programming Problem	375
A.3 Daniel McFadden: Convex Analysis	383
1. Introduction	383
2. Notation	383
3. Hyperplanes	384
4. Convex sets	384
5. Affine subspaces	384
6. Separation of sets	384
7. Cones	384
8. Polar and normal cones	385
9. Convex functions	385
10. Properties of convex sets	385
11. Semi-bounded sets	387
12. Properties of convex functions	390
13. Properties of maximand correspondences	392
14. Exposed sets	396
15. Conjugate correspondences	397
16. Differential properties	401
A.4 Lawrence J. Lau: Testing and Imposing Monotonicity, Convexity and Quasi-Convexity Constraints	409
1. Introduction	409
2. Hessian matrices of convex and quasi-convex functions	414
3. The Cholesky factorizability of semidefinite and indefinite matrices	421
4. Estimation	437
5. Testing of hypotheses	447
6. Conclusion	452
Bibliography	455
Author Index	471
Subject Index	475