

Contents

Foreword by Norman Borlaug	ix
Acknowledgments	xiii
List of Tables	xxi
List of Figures	xxvii
List of Boxes	xxxii
PART I CONTEXT	1
CHAPTER 1 Introduction	3
CHAPTER 2 A Brief History of U.S. Agriculture	9
2.1 Trends in Agricultural Output	9
2.2 Farms and Farmers	16
2.3 Conclusion	21
PART II INPUTS, OUTPUTS AND PRODUCTIVITY	23
CHAPTER 3 Agricultural Inputs	25
3.1 Overview	25
3.2 The Composition of Capital	33
3.3 The Composition of Labor	39
3.4 The Composition of Land	44
3.5 Other Inputs	46
3.6 Factor Proportions, Relative Prices and Cost Shares	50
3.7 Conclusion	54
CHAPTER 4 Agricultural Outputs	57
4.1 Value, Composition and Location of Production	57
4.2 Indexes of the Quantity and Price of Output	69
4.3 Conclusion	74

xviii CONTENTS

CHAPTER 5	Agricultural Productivity Patterns	87
5.1	Partial Factor Productivity Measures	88
5.2	Multi-Factor Productivity Measures	100
5.3	A Systematic Slowdown in Productivity Growth?	110
5.4	Conclusion	120
APPENDIX II	The InSTePP Production Accounts	127
PART III	AGRICULTURAL R&D FUNDING AND POLICIES	135
CHAPTER 6	Research Funding and Performance	137
6.1	Overall Spending on the Sciences	137
6.2	Global Agricultural R&D Spending	143
6.3	U.S. Public and Private Agricultural Research	147
6.4	Trends in U.S. Public Agricultural Research and Extension Spending	151
6.5	Intensity of Investment	161
6.6	Sources and Forms of Funding	171
6.7	Conclusion	175
CHAPTER 7	The Federal Role	187
7.1	Enhanced Incentives to Innovate	188
7.2	Organized Agricultural Research and Extension	193
7.3	Forms of Federal Funding	198
7.4	Conclusion	210
APPENDIX III	U.S. Public Agricultural Research and Extension Series	229
	State Agricultural Experiment Stations (SAESs)	229
	RPA (Research Problem Area) and Commodity Focus	234
	Intramural USDA Research	234
	Extension Expenditures	235
	Research Deflator	236
PART IV	MODELS OF R&D AND PRODUCTIVITY	237
CHAPTER 8	Research Lags and Spillovers	239
8.1	R&D Lags in Econometric Models	240
8.2	Stylized Facts about R&D Lags in Agriculture	244
8.3	Evidence on Research-Innovation-Adoption Lags	248
8.4	Spatial Aspects of the R&D Attribution Problem	259
8.5	Conclusion	262

APPENDIX 8-1	Models of Industrial R&D	265
CHAPTER 9	Models of Research and Productivity	271
9.1	Modeling Productivity and Knowledge Stocks	271
9.2	Specification of R&D Lag Distributions	275
9.3	Spillover Coefficients and Knowledge Stocks	284
9.4	More About Extension Knowledge Stocks	297
9.5	Weather	300
9.6	Conclusion	302
CHAPTER 10	Econometric Estimation and Results	313
10.1	Estimation Procedure	313
10.2	Base Model Estimates	317
10.3	Sensitivity of Results to Model Variations	328
10.4	Interpretation and Assessment	345
CHAPTER 11	Productivity Patterns and Research Benefits	353
11.1	Growth Accounting	354
11.2	Analysis of State and National Benefits and Costs	366
11.3	Prospective Productivity Patterns	385
PART V	INTERPRETATION AND SYNTHESIS	409
CHAPTER 12	Interpretation and Assessment of Benefit-Cost Findings	411
12.1	Summary of Main Findings	412
12.2	Determinants of Benefits	416
12.3	Plausibility of Estimates—Various Perspectives	423
CHAPTER 13	Synthesis	453
13.1	Factology	454
13.2	A Systematic Slowdown?	457
13.3	Attribution	457
13.4	Research Returns	460
13.5	Prospects	462
	References	465
	Index	493



<http://www.springer.com/978-1-4419-0657-1>

Persistence Pays

U.S. Agricultural Productivity Growth and the Benefits from
Public R&D Spending

Alston, J.M.; Andersen, M.A.; James, J.S.; Pardey, P.G.

2010, XXXII, 504 p. 215 illus., Hardcover

ISBN: 978-1-4419-0657-1