## ESSAYS IN HONOR OF EDWIN MANSFIELD:

The Economics of R&D, Innovation, and Technological Change

Edited by ALBERT N. LINK University of North Carolina at Greensboro, Bryan School of Business and Economics, USA

F. M. SCHERER Harvard University, Kennedy School of Government, Emeritus, USA



## ESSAYS IN HONOR OF EDWIN MANSFIELD: The Economics of R & D, Innovation, and Technical change

## Edited by Albert N. Link and F.M. Scherer

Preface	vii
Introduction	
F.M. SCHERER / Edwin Mansfield: An Appreciation	1-7
Innovation, Technology, and Economic Growth	
ROBERT M. SOLOW / Flexibility and Endogenous Innovation	9–13
F.M. SCHERER / Schumpeter and the Micro-foundations of Endogeous Growth	1526
DAVID J. TEECE / Technology and Technology Transfer: Mansfieldian Inspirations and Subsequent Developments	27–43
JOACHIM HENKEL AND ERIC VON HIPPEL / Welfare Implications of User Innovation	45-59
GREGORY TASSEY / Underinvestment in Public Good Technologies	61–85
ALBERT N. LINK AND JOHN T. SCOTT / Evaluating Public Sector R&D Programs: The Advanced Technology Program's Investment in Wavelength References for Optical Fiber Communications	8 <b>7</b> –97
Research and Development and Innovation	
JAMES D. ADAMS / Industrial R&D Laboratories: Windows on Black Boxes?	99–107
JOHN T. SCOTT / Public Policy and Environmental Research and Development	109–127
JACQUES MAIRESSE AND PIERRE MOHNEN / The Importance of R&D for Innovation: A Reassessment Using French Survey Data	129–143
GIUSEPPE MEDDA, CLAUDIO PIGA AND DONALD S. SIEGEL / University R&D and Firm Productivity: Evidence from Italy	145–151
PHILIP E. AUERSWALD AND LEWIS M. BRANSCOMB / Reflections on Mansfield, Technological Complexity, and the "Golden Age" of U.S. Corporate R&D	153–171
KATHRYN L. COMBS / The Welfare Effects of Research and Production Joint Ventures	173-185
ALBERT N. LINK / Research Joint Ventures in the United States: A Descriptive Analysis	187–195
Patenting and the Diffusion of Knowledge	
BRONWYN H. HALL / Exploring the Patent Explosion	195–208
JOSH LERNER / The University and the Start-Up: Lessons from the Past Two Decades	209-216
WESLEY M. COHEN / Patents and Appropriation: Concerns and Evidence	217-231
DAVID C. MOWERY AND BHAVEN N. SAMPAT / The Bayh-Dole Act of 1980 and University-Industry Technology Transfer: A Model for Other OECD Governments?	233-245
ALESSANDRA CANEPA AND PAUL STONEMAN / Financing Constraints in the Inter Firm Diffusion of New Process Technologies	247-257
J.S. METCALFE / Ed Mansfield and the Diffusion of Innovation: An Evolutionary Connection	259-269

vi Contents

DAVID B. AUDRETSCH AND ERIK E. LEHMANN / Mansfield's Missing Link: The	
Impact of Knowledge Spillovers on Firm Growth	271–274
KENNETH L. SIMONS / Predictable Cross-Industry Heterogeneity in Industry Dynamics	275–279
DAVID B. AUDRETSCH AND ERIK E. LEHMANN / Mansfield's Innovation in the Theory of Innovation	281–290
MICHAEL GALLAHER AND K. CASEY DELHOTAL / Modeling the Impact of Technical Change on Emissions Abatement Investments in Developing Countries	291–305
Index of Names	307