

Skill-Biased Technological Change

Evidence from a Firm-Level Survey

Donald S. Siegel

1999

W.E. Upjohn Institute for Employment Research
Kalamazoo, Michigan

Contents

Acknowledgments	vii
The Author	viii
1 Introduction	1
The Importance of the Problem	1
Benefits of Examining the Long Island Survey	4
Overview and Major Conclusions	7
Notes	9
2 Previous Studies of Skill-Biased Technological Change	11
Notes	23
3 The Survey and the Econometric Model	25
The Survey Methodology	25
Summary Statistics for the Long Island Sample	27
Econometric Issues	34
Proposed Econometric Specification	37
Notes	43
4 Characteristics of Advanced Manufacturing Technologies	45
Linked vs. Integrated Technologies	46
Linked AMTs	46
Integrated AMTs	50
Employee Empowerment Aspects of AMT	53
A Disaggregated Analysis of Skill-Biased Technological Change	57
Note	59
5 Empirical Results	61
Determinants of AMT Adoption	62
Employment and Empowerment Effects of AMT Adoption	66
Notes	80
6 Case Studies	81
Symbol Technologies	81
Company Background	81
Findings Based on Interviews and Plant Visits	83

Lumex Corporation	85
Company Background	85
Findings Based on Interviews and Plant Visits	86
Pall East Hills Manufacturing	88
Company Background	88
Findings Based on Interviews and Plant Visits	89
Electronic Hardware	91
Company Background	91
Findings Based on Interviews and Plant Visits	92
Summary of Field Interviews	94
Notes	96
7 Summary of Findings and Policy Implications	97
Summary of Statistical Findings	98
Policy Implications and Recommendations	100
Notes	105
Appendix: Survey Questionnaire	107
References	115
Author Index	125
Subject Index	129

List of Tables

2.1 Twenty-Seven Recent Empirical Studies of Skill-Biased Technological Change	14
3.1 Industry Distribution for the 79 Surveyed Companies	28
3.2 Coverage of 11 Defense-Related Industries in the Long Island Survey (1990)	29
3.3 Characteristics of 79 Long Island Manufacturers in 1990	31
3.4 Long Island Survey Firms vs. U.S. Rates of Technology Adoption by Industry, Size, and Age of Firm	32
3.5 Distributions of Number of AMTs Adopted by the 79 Survey Firms	34

3.6 Distributions of Year of Adoption of AMTs by the 79 Survey Firms	35
5.1 Determinants of the Probability of AMT Adoption	64
5.2 Determinants of the Conditional Probability of AMT Adoption	65
5.3 Employment Levels, Changes, and Shares for Adopters vs. Non-Adopters of AMTs	67
5.4 Estimates of Differences in Mean Logarithmic Changes between Firms Adopting an AMT in Year t and Those That Did Not	68
5.5 Two-Stage Probit Estimation of Employment Equations	70
5.6 Rotated Factor Structure Matrix of AMTs	72
5.7 Firms Adopting Methods of AMT Implementation That Are Consistent with an Enhancement in Employee Empowerment	73
5.8 Mean and Median Employment Levels, Percentage Changes, and Shares for AMT Firms	75
5.9 Differences in Mean Growth Rates of Employment Shares between Firms Adopting AMTs in Year t versus Those Not Adopting AMTs	77