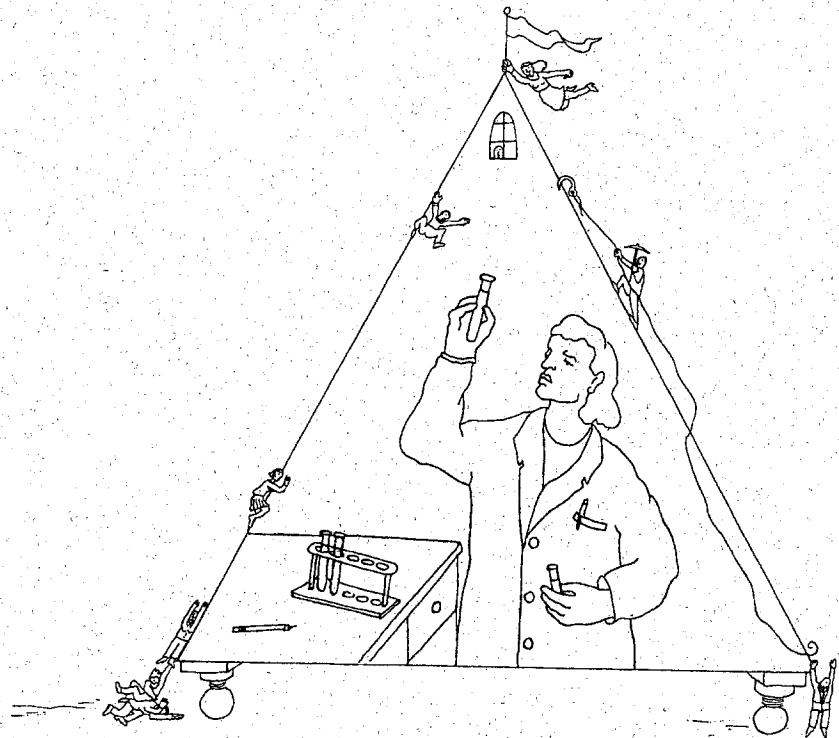


NBER
NATIONAL BUREAU OF ECONOMIC RESEARCH
BRIEFING BOOK



**POLICY AND DATA ISSUES
OF THE SCIENTIFIC WORKFORCE**

NBER / SLOAN FOUNDATION WORKSHOP

March 23, 2001

Richard B. Freeman: Organizer

American Association for the Advancement of Science
1200 New York Avenue, NW
Washington, DC

TABLE OF CONTENTS

INTRODUCTION

Stephan, Paula E. 1996. "The Economics of Science," Journal of Economic Literature 34 (September) 1199-1235. 1

1. THE PERENNIAL SHORTAGE-SURPLUS DEBATE

Goeff Davis, "Mathematicians and the Market" <u>Notices of the AMS</u> Nov 1997.	21
Freeman, Richard. 1975. "Supply and Salary Adjustments to the Changing Science Manpower Market: Physics" 1948-73. <u>American Economic Review</u> 65:1 (March) 27-39.	27
Freeman, Richard. 1980. "Employment Opportunities in the Doctorate Manpower Market" <u>Industrial and Labor Relations Review</u> 33:2 (January).	35
Stern, Scott. 2000. "Do Scientists Pay to Be Scientists?" MIT Sloan School (May).	43
Zucker, Lynne G., Michael R. Darby and Maximo Torero. 1997. "Labor Mobility from Academe to Commerce," NBER WP#6050, May. (Cambridge, MA: NBER).	73
DEBATE:	
Steinberg, Douglas. 2000. "Another Study Raps PhD Overproduction," <u>The Scientist</u> 14[19]:32 (Oct 2).	93
Lane, Neal F. 1995. "Separating Science Policy from Science Fiction," Remarks to the National Forum on Setting Strategic Direction for PhD. Supply/Demand, Council of Scientific Society Presidents, December 4.	95
Massey, Walter E. 1992. "NSF Stance on 'skills shortage,'" <u>Nature</u> 357:11 (June) 433.	99
Holden, Constance. 1991. "Do We Need More PhDs or Is Fewer Really Better?" <u>Science</u> 251:4997 (March 1) 1017-18.	100
Begley, Sharon. 1991. "Gridlock in the Labs," <u>Newsweek</u> 117:2 (January 14) 44.	101
Marshall, Eliot. 1992. "Congress: Was the 'Shortfall' Phoney?" <u>Science</u> 256:5054 (April 10) 172.	102
Duderstadt, James J. 1992. "Too Many Scientists? Don't Believe It," <u>Washington Post</u> (June 2) A19.	103
Wolpe, Howard. 1992. "Bogus Study About Scientists," <u>Washington Post</u> (June 13) A19.	104
Griffiths, Phillip. 1995. "No PhD Glut in Science and Engineering," <u>Washington Post</u> (July 29) A12.	105
Greenberg, Daniel S. 1995. "Surplus in Science," <u>Washington Post: Editorial</u> (December 2).	106
Greenberg, Daniel S. 1999. "Scientists Attack the Federal Budget with the Politics of Calculated Panic," <u>Washington Post</u> , Column, Point of View (April 22).	107
Goodstein, David L. 1995. "After the Big Crunch," <u>Science</u> (Summer) 53-60.	109
Greenhouse, Steven. 2000. "Strong Job Market Create a Hiring Frenzy in High-Tech Fields," <u>New York Times</u> (June 3).	113
National Research Council. "Methods of Forecasting Demand and Supply of Doctoral Scientists and Engineers," <u>Proceedings of a Workshop</u> , Office of Scientific and Engineering Personnel.	115
Atkinson, Richard C. 1996. "The Numbers Game and Graduate Education," Transcript of Remarks: Conference on Graduate Education in the Biological Sciences in the 21 st Century, San Francisco (October 2). www.ucop.edu/ucophome/pres/coments/numbers.html .	119
Zare, Richard N. 1998. "Preparing Future PhD's for a Changing Job Market," <u>Commentary</u> (January 5) www.the-scientist.library.upenn.edu/yr1998/jan/comm_980105.html .	122

2. IMMIGRANT SET WORKERS

Lowell, B. Lindsay. 1998. "Statistics on Foreign Scientists and Engineers," <u>Georgetown University Workshop</u> , October.	123
Levin, Sharon G. and Paula E. Stephan. 1999. "Are the Foreign Born a Source of Strength for U.S. Science?" <u>Science</u> 285 (August 20) 1213-1214.	133

Stephan, Paula E and Sharon G. Levin. 2000. "Exceptional Contributions to U.S. Science by the Foreign-Born and Foreign-Educated," forthcoming <u>Population Research and Policy Review</u> (September).	135
Levin, Sharon G., Paula E. Stephan and Anne E. Winkler. 2000. "Imported Brains in Science and Engineering: Employment Consequences for U.S.-Citizens". Draft. Prepared for the Conference on Migration and Development, Office of Population Research, Princeton University, May 4-6.	147
Johnson, Jean M. and Mark C. Regets. 1998. "International Mobility of Scientists and Engineers to the United States – Brain Drain or Brain Circulation?" <u>Issue Brief</u> Division of Science Resources Studies, NSF 98-316 (June 22).	167
Burton, Lawrence and Jack Wang. 1999. "How Much Does the U.S. Rely on Immigrant Engineers?" <u>Issue Brief</u> Division of Science Resources Studies, NSF 99-32 (February 11).	169
Currie, Chris. 1998. "IEEE-USA/Harris Poll: U.S. Public Overwhelmingly Opposed to H-1B Visa Expansion," (September 16).	171
Reed, Billy E. 1995. "Statement of the President: American Engineering Association," submitted to the House Judiciary Subcommittee on Immigration and Claims (June 29).	173
Stossel, Scott. 1999. "Uncontrolled Experiment," <u>The New Republic</u> (March 29).	179
Anderson, Stuart. 1996. "They Don't Work Cheap; They Don't Steal Jobs. The Wage and Employment Impact of Immigrant Scientists and Engineers in High Technology," <u>International Educator</u> NAFSA.	183
Deutch, John. 1991. "The Foreign Policy of U.S. Universities," <u>Science</u> Editorial 253:5019 (August 2) 492.	189
Hopke, Philip K. 1991. "Foreign Students and U.S. Economic Health," <u>Science</u> Letter in response to Deutch Editorial, 253:5019 (August) 1194.	189
Dash, Julekha. 2001. "H-1B Hiring Steady Despite Cap Increase," <u>IT World.com</u> (Feb 28) www.itworld.com/News/2001/2/CWSTO58064/pfindex.html .	190

3. DATA

Davis, Geoff and Peter Fiske. "Results from the 1999 Ph.Ds.org Graduate School Survey."	191
National Research Council. "Measuring the Science and Engineering Enterprise: Priorities for the Division of Science Resource Studies," Office of Scientific and Engineering Personnel, Committee on National Statistics. (Washington DC: National Academy Press).	195

4. CAREERS

Special Report for <u>Science</u> . 1999. "Postdocs Working for Respect," <u>Science</u> Vol 285:5433, Issue of 3 (Sept 3)1513-1535. Individual articles by:	
Mervis, Jeffrey. "The World of Postdocs," Introduction.	201
Ferber, Dan. "Postdoc Activism: Getting to the Front of the Bus."	202
Ferber, Dan. "Postdoc Activism: What Postdocs Want – and How."	203
Ferber, Dan. "Postdoc Activism: Irreconcilable Differences."	204
Schmidt, Karen. "Science Careers: Will the Job Market Ever Get Better?"	205
Mervis, Jeffrey. "Economics: Cheap Labor Is Key to US Research Productivity."	207
Normile, Dennis. "Japan: Japanese Jump on Postdoc Bandwagon."	209
Mervis, Jeffrey. "Foreign Exchanges: Going Abroad Needn't Mean Going Into Exile."	210
Balter, Michael. "Foreign Exchanges: Europeans Who Do Postdocs Abroad Face Reentry Problems."	212
Balter, Michael. "Germany: Germany Tries to Break Its Habilitation Habit."	213
Normile, Dennis. "Denmark: Denmark Proposes Postdoc Tonic for Universities."	214
Holden, Constance. "Career Advice: Eight Attributes of Highly Successful Postdocs."	215
Mervis, Jeffrey. "News: Minority Postdocs Are Rare, Independent Breed."	217
Vogel, Gretchen. "News: A Day in the Life of a Topflight Lab."	219
Nerad, Maresi and Joseph Cerny. "Viewpoint: Postdoctoral Patterns, Career Advancement, and Problems."	221

Levin, Sharon G. and Paula E. Stephan. 1991. "Research Productivity Over the Life Cycle: Evidence for Academic Scientists," <i>American Economic Review</i> 81:1 (March) 114-132.	225
Preston, Anne E. 2000. "Do Differences in Rates of Skill Depreciation across Scientific Fields Impact Labor Market Outcomes?" Haverford College, draft under publisher review. June.	235
Preston, Anne E. 1994. "Why Have All the Women Gone? A Study of Exit of Women from the Science and Engineering Professions," <i>American Economic Review</i> 84:5 (December) 1446-1462.	247
Leslie, Larry L. and Ronald L. Oaxaca. 1998. "Women and Minorities in Higher Education," <i>Higher Education: Handbook of Theory and Research</i> Vol XIII (Bronx, NY: Agathon Press).	257
National Research Council. 1998. "Trends in the Early Careers of Life Scientists," Chapter 3. Committee on Dimensions, Causes and Implications of Recent Trends in the Careers of Life Scientists. Board on Biology, Commission on Life Sciences, Office of Scientific and Engineering Personnel (Washington, DC: National Academy Press). Pp 33-48.	283
Malcom, S.M., V.V. Van Horne, C.D. Gaddy and Y.S. George. 1998. "Losing ground: Science and Engineering Graduate Education of Black and Hispanic Americans." (Washington, DC: AAAS, Directorate for Education and Human Resources Programs) 5-8.	293
Bunk, Steve. 1998. "Young Scientists Face Demand for Broader-Based Education," <i>The Scientist</i> (August 17) 12-13.	297
Boyd, Douglas and Michael Van Dyke. 2000. "PhDs Graduating in 1989 and in 1970-72 Show Substantial Variation. A Career Outcome Study," <i>The Scientist</i> 14[11]:39 (May 29).	298
Regets, Mark C. 1999. "Has the Use of Postdocs Changed?" <i>Issue Brief</i> Divison of Science Resources Studies, NSF 99-310 (December 2).	299
National Science Foundation, Division of Science Resource Studies. 1999. "Retention of the Best Science and Engineering Graduates in Science and Engineering," NSF 99-321, Project Officer, John Tsapogas (Arlington, VA).	301

5. PRODUCTIVITY

Bound, John, Gabor Kezdi, and Sarah Turner. 2000. "Trade in University Training: Cross State Variation in the Production and Use of College Educated Labor," manuscript under publisher review (July 25).	307
Lynne G. Zucker, Michael R. Darby, and Marilynn B. Brewer. 1998. "Intellectual Human Capital and the Birth of U.S. Biotechnology Enterprises," <i>American Economic Review</i> Vol 88:1 (March) 290-306.	327
Adams, James D., Eric P. Chiang, Katara Starkey. 2000. "Industry-University Cooperative Research Centers" NBER WP# 7843, August. (Cambridge, MA: NBER).	337
Adams, James D. 2000. "Endogenous R&D Spillovers and Industrial Research Productivity," University of Florida (July).	345
Jaffe, Adam B. and Josh Lerner. 1999. "Privatizing R&D: Patent Policy and the Commercialization of national Laboratory Technologies," NBER WP#7064, April (Cambridge, MA: NBER).	369
Branstetter, Lee. 2000. "Is Foreign Direct Investment A Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States," NBER WP#8015, November (Cambridge, MA: NBER).	395
Tsapogas, John and Lawrence M. Rausch, Project Officers, Mary Collins, Westat. 1999. "Will Small Business Become the Nation's Leading Employer of Graduates with Bachelor's Degrees in Science and Engineering?" NSF Division of Science Resource Studies (January).	415

6. RECENT POLICY RESPONSES

Romer, Paul M.. 2000. "Should the Government Subsidize Supply or Demand in the Market for Scientists and Engineers?," NBER WP#7723, June (Cambridge, MA: NBER).	421
---	-----

Hetter, Katia. 2001. "NYU Recognizes Grad Student Union," Newsday.com (March 3) A21.	447
Trick, Randy. 2000. "GPSS Calls on Administration to Recognize TA Unionization," <u>The Daily University of Washington Student Newspaper</u> (April 13).	448
PR Newswire. 2000. "University of Illinois Graduate Employees Win Contract Rights; Unanimous Court Ruling Allows IFT Union Election." (June 30).	449
Sacbee.com News. "UC Graduate Student Employees Vote for Union."	450
O'Neill, James M. 2000. "Temple Grad Students Gain Right to Unionize," <u>Philadelphia Enquirer</u> (October 19)	451
Krumholz, Mark. "UAW Local 2865," Bargaining web-page created for UAW Local 2865.	453
Marincola, Elizabeth and Frank Solomon. 1998. "The Career Structure in Biomedical Research: Implications for Training and Trainees: The American Society for Cell Biology survey on the State of the Profession," <u>Molecular Biology of the Cell</u> 9 (November) 3003-6.	455
Griffiths, Phillip A. 1995. "Reshaping the Graduate Education of Scientists and Engineers," Preface. (Washington, DC: National Academy Press).	457
National Academy of Sciences. 1995. "Reshaping the Graduate Education of Scientists and Engineers," Executive Summary. (Washington, DC: National Academy Press).	459
Association of American Universities. 1998. "Committee on Graduate Education: Report and Recommendations." (October). www.aau.edu	467
Odom, William E. 1998. "Report on the Senior Assessment Panel for the International Assessment of the U.S. Mathematical Sciences," (March).	487
Jackson, Allyn. 2001. "NSF Launches Major Initiative in Mathematics," <u>Notices of the AMS</u> 48:2 (February) 190-192.	491
Jackson, Allyn. 2001. "Job Market Brightens for Applicants," <u>Notices of the AMS</u> 48:4 (April) 394-5.	495
National Research Council. 1998. "Trends in the Early Careers of Life Scientists," Executive Summary. Committee on Dimensions, Causes and Implications of Recent Trends in the Careers of Life Scientists. Board on Biology, Commission on Life Sciences, Office of Scientific and Engineering Personnel (Washington, DC: National Academy Press). Pp 1-10.	497
National Research Council. "Addressing the Nation's Changing Needs for Biomedical and Behavioral Scientists." Executive Summary and Chapter 5. Committee on National Needs for Biomedical and Behavioral Scientists, Education and Career Studies Unit, Office of Scientific and Engineering Personnel. (Washington, DC: National Academy Press). Pp 1-3; 53-61.	509