



National Science Foundation

Division of Science Resources Statistics

Some Data and Perspectives on Science and Engineering Labor Force Conditions

National Academies, Joint Meeting of Committee on Underrepresented Groups and the Expansion of the S&E Workforce Pipeline and Committee on Capitalizing on the Diversity of the S&E Workforce in Industry

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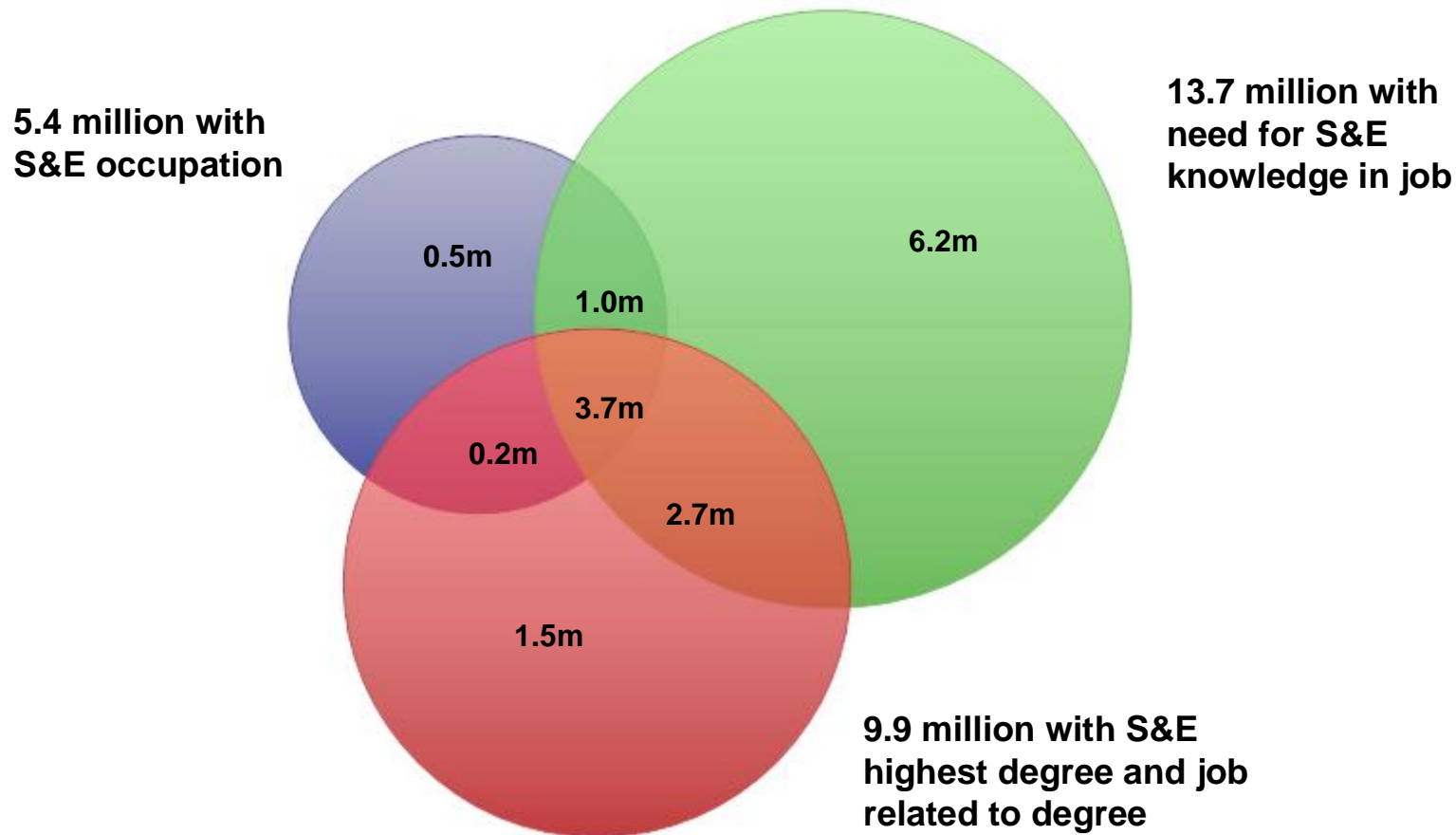
National Science Foundation, Division of Science Resources Statistics
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**There are many different
concepts of the science and
engineering labor force**



Complex overlapping concepts of the science and engineering workforce



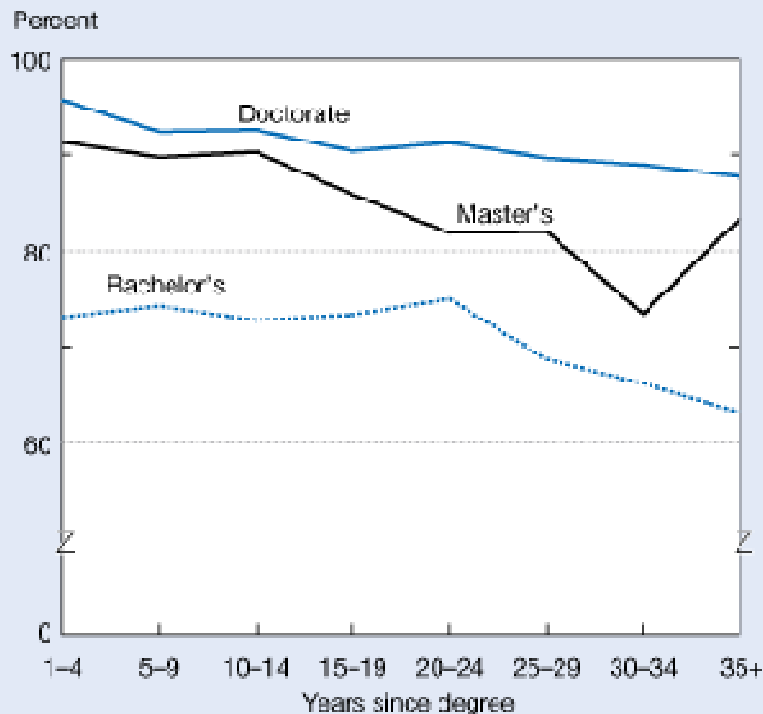
Note: Circle sizes are proportionate to population size, but intersection sizes are not proportional.

Source: 2003 National Survey of College Graduates



Even at the bachelor's degree level, most S&E grads report that their job is related to the field of their degree

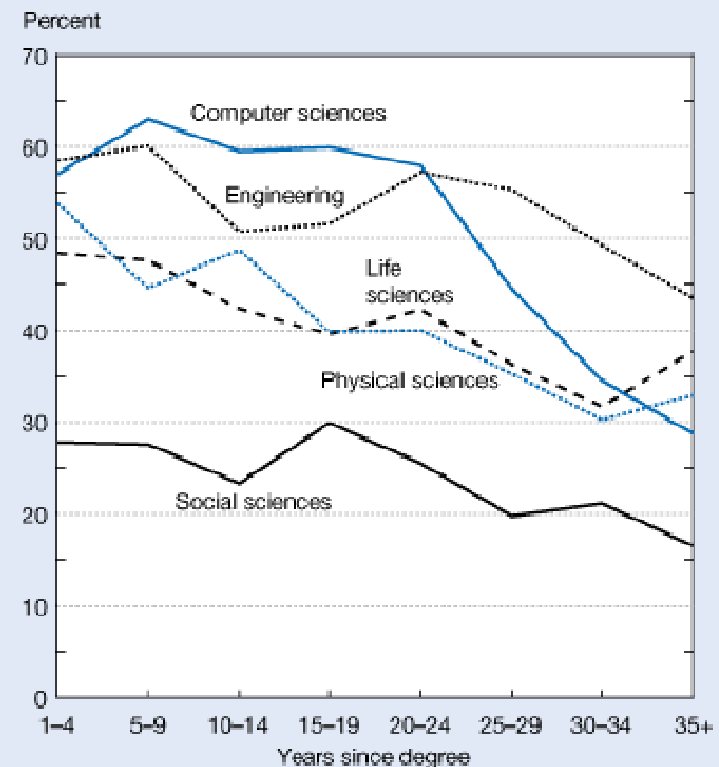
Figure 3-10
Individuals with highest degree in S&E employed in jobs closely or somewhat related to highest degree, by years since highest degree: 2003



SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 2003, <http://sestat.nsf.gov>.

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Figure 3-11
S&E bachelor's degree holders employed in jobs closely related to degree, by field and years since degree: 2003

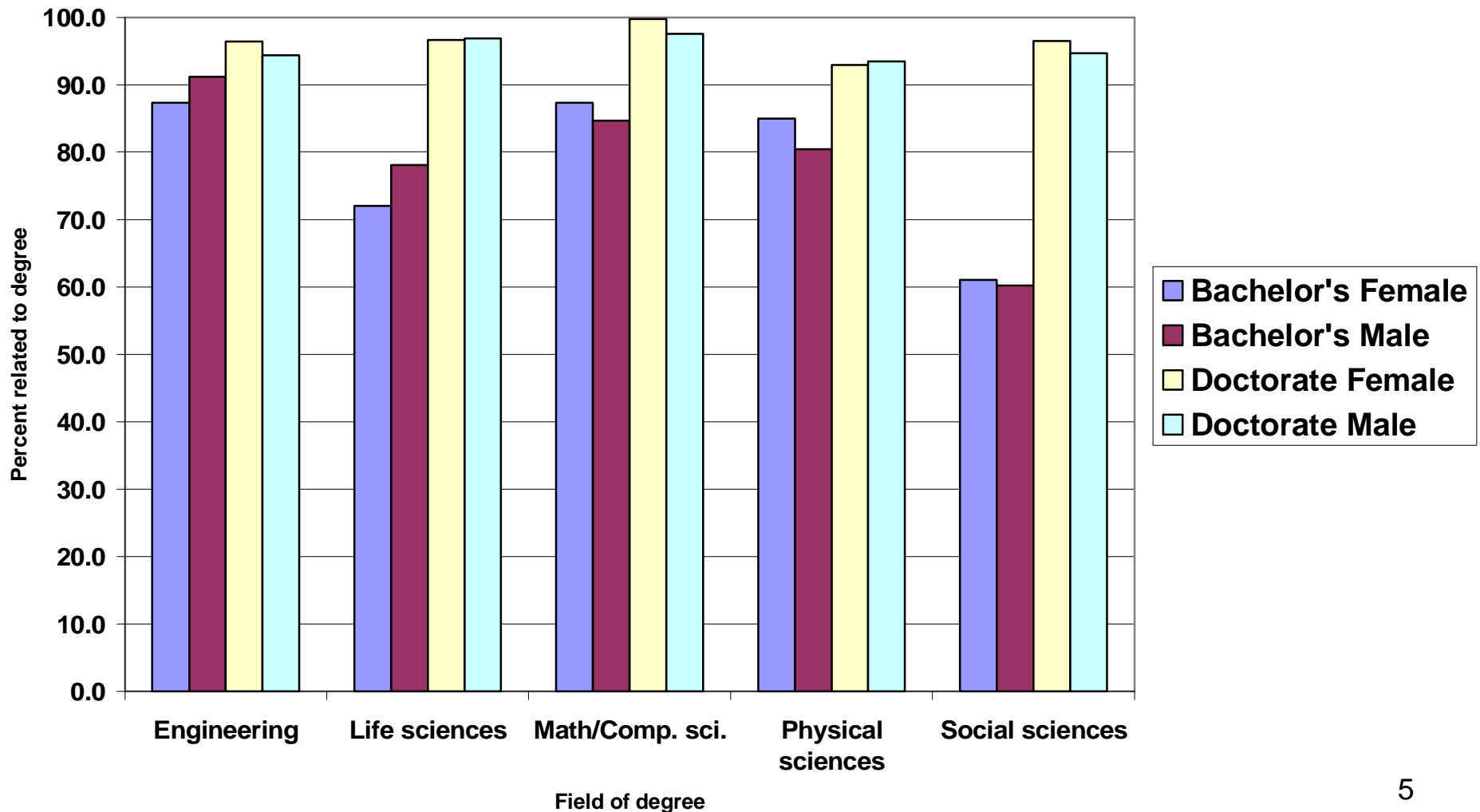


SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 2003, <http://sestat.nsf.gov>.

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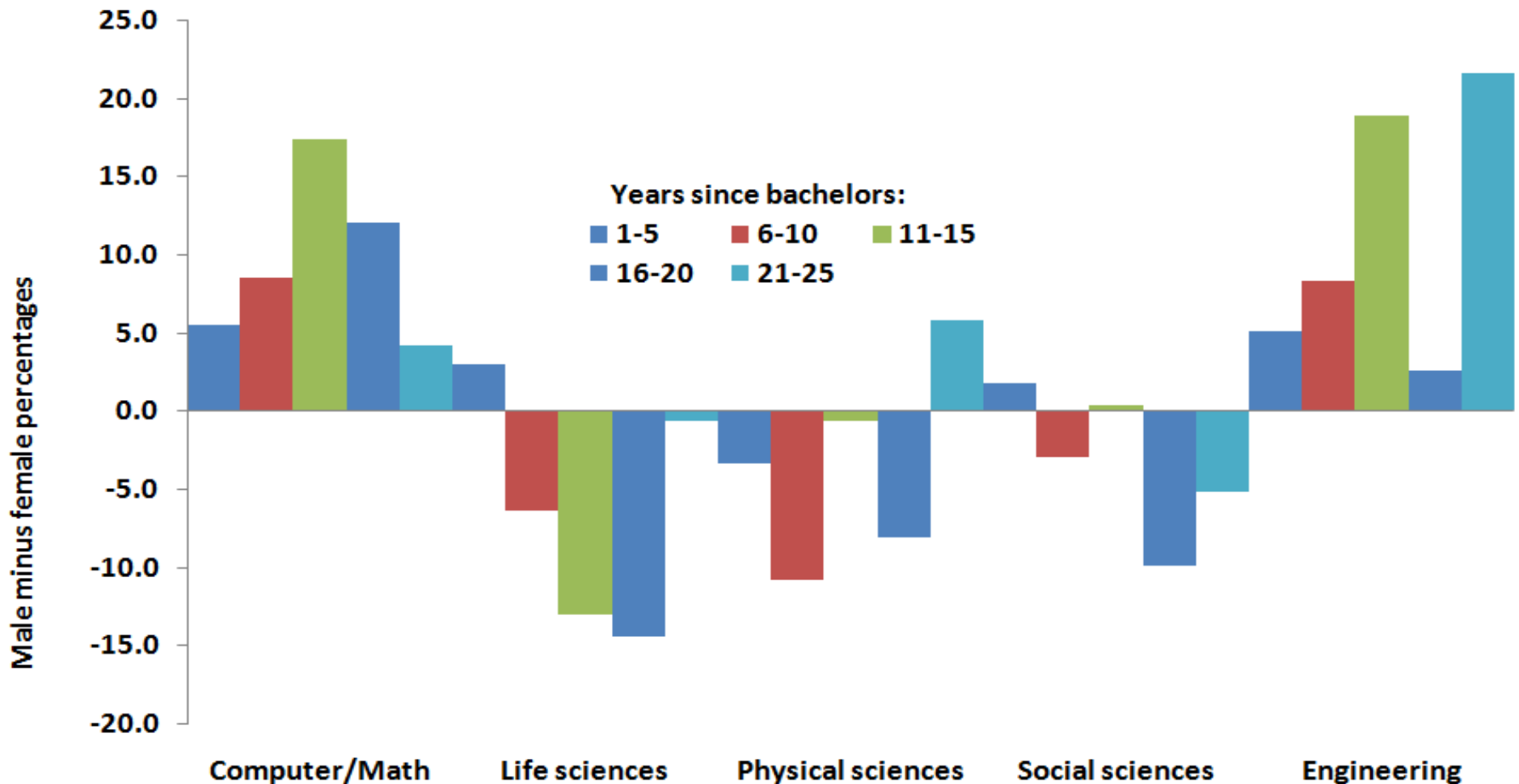


Percent of recent S&E degree recipients (1-4 years after degree) reporting their job is related to the field of their degree: 2003





Difference between the percentage of male and female S&E bachelor's degree recipients reporting that their job was related to their field of degree, by years since bachelor's and broad field: 2006



Source: NSF/SRS SESTAT 2006 estimates

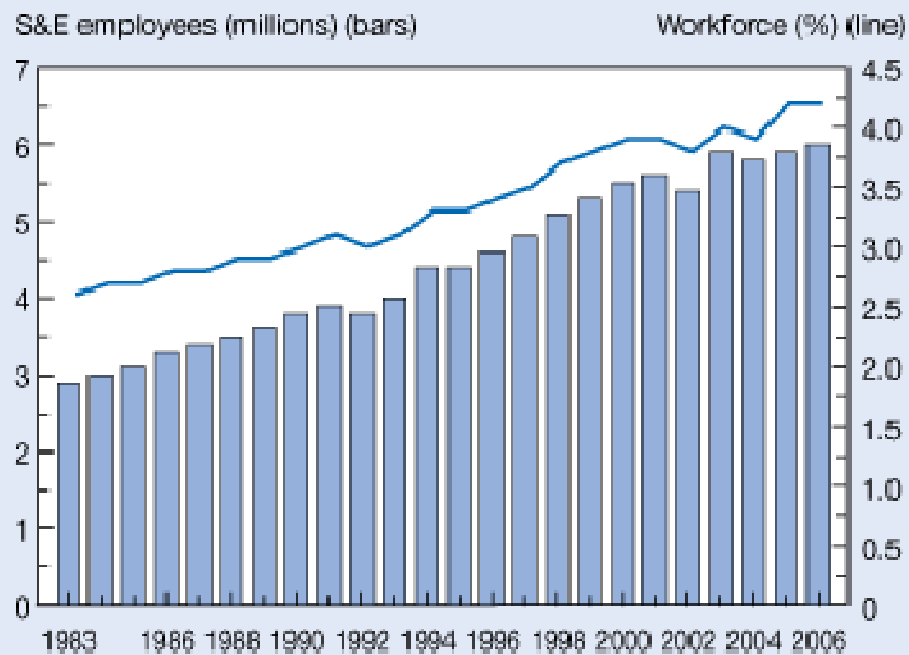


Growth in science and engineering employment has long outpaced both labor force growth and growth in degree production



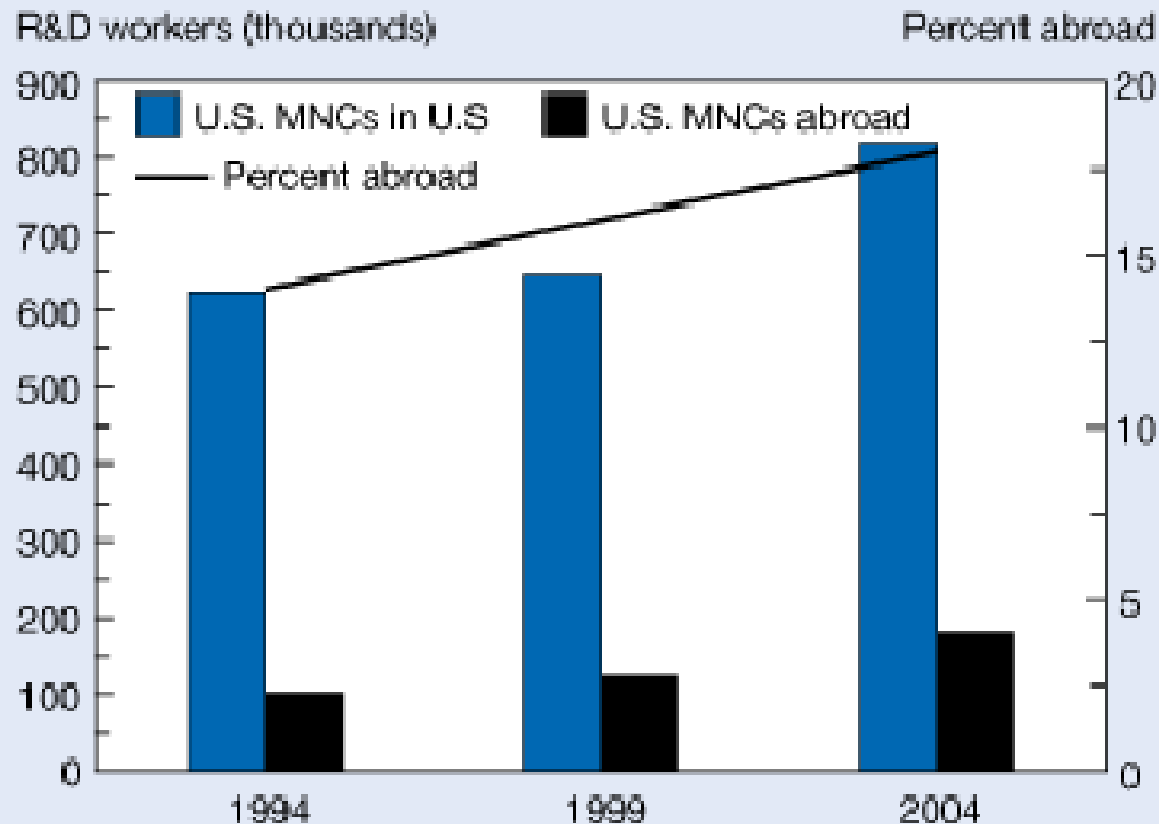
Growth in employment in S&E occupations resumed after 2003 decline

Figure 3-4
U.S. workforce in S&E occupations: 1983–2006



SOURCE: National Science Foundation, Division of Science Resources Statistics, special tabulations from Bureau of Labor Statistics, Current Population Survey Monthly Outgoing Rotation files (1983–2006).

Figure 3-54
**R&D employment of U.S. MNCs in United States
 and at their foreign affiliates: 1994, 1999, and 2004**

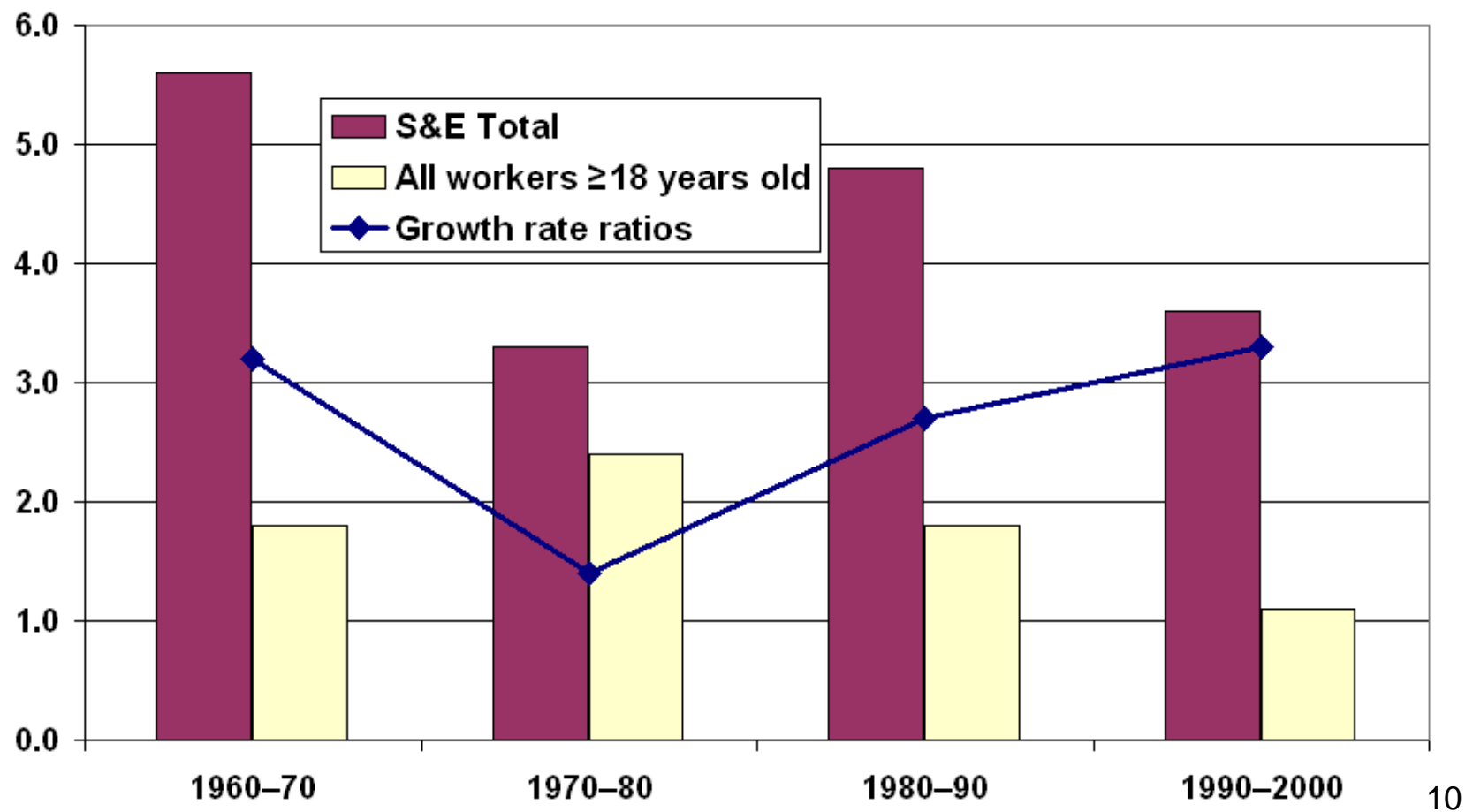


MNC = multinational corporation

SOURCE: Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States, and Survey of U.S. Direct Investment Abroad, 2004 (preliminary data).



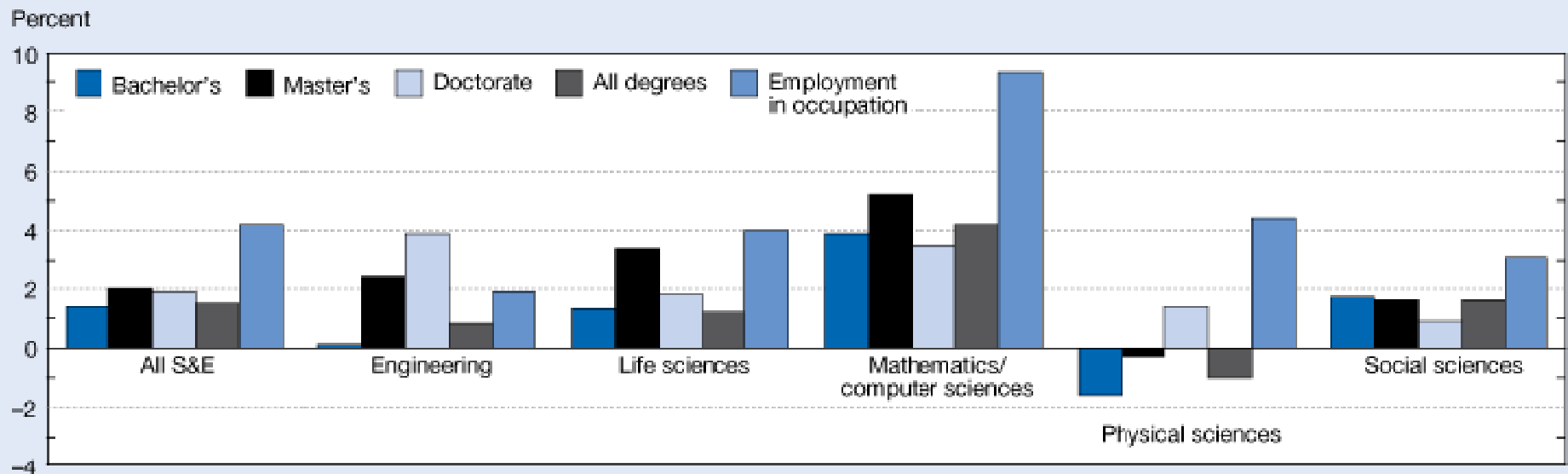
Growth of employment in science and engineering occupations compared to U.S. workforce





Employment in S&E occupations has grown faster than growth in degrees

Figure 3-3
Annual average growth rate of degree production and occupational employment, by S&E field: 1980–2000



SOURCES: Census Bureau, Public Use Microdata Sample (PUMS), 1980–2000; and National Science Foundation, Division of Science Resources Statistics, data on degree production and special tabulations.



Rapid Growth in S&T employment globally

Growth rates for selected S&E labor force measurements

Measurement	Source	Years	Average annual growth rate (%)
Researchers in OECD countries	OECD	1995–2002	3.4
Doctorate holders in U.S. nonacademic S&E occupations	U.S. Census	1990–2005	4.6
College graduates in U.S. nonacademic S&E occupations	U.S. Census	1990–2005	3.8
S&E doctorate holders in U.S.	NSF/SRS SESTAT	1993–2003	3.0
S&E bachelor's degree and above holders in U.S.	NSF/SRS SESTAT	1993–2003	3.6
Researchers in China	OECD	2000–2003	12 ^{7.4}

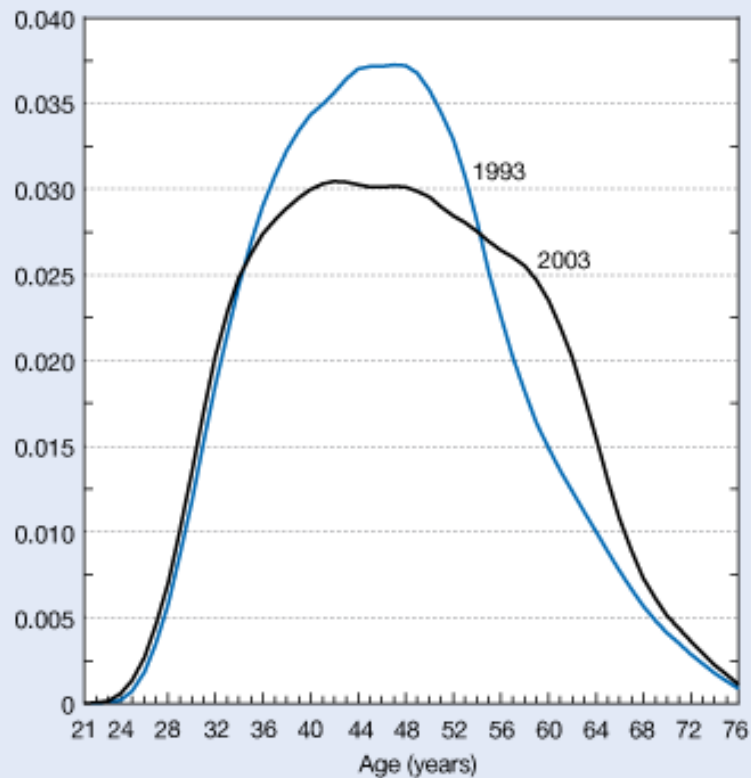


Until recently, only a relatively small portion of the U.S. science and engineering labor force was near retirement ages

The age distribution of science and engineering degree holders is becoming more symmetrical with larger portions near retirement ages

Figure 3-48
Age distribution of S&E doctorate holders in labor force: 1993 and 2003

Density (percent)



NOTE: Age distribution smoothed using kernel density techniques.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1993 and 2003, <http://sestat.nsf.gov>.

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Labor markets adjust towards equilibrium, making “shortage or surplus” a not very useful question:

- Zero unemployment and zero vacancies would tell us only that an equilibrium has been reached.
- The optimal level of S&E activity **for society** could be higher or lower.
- The optimal tradeoff between unemployment risk and career opportunities **for scientist and engineers** could be higher.

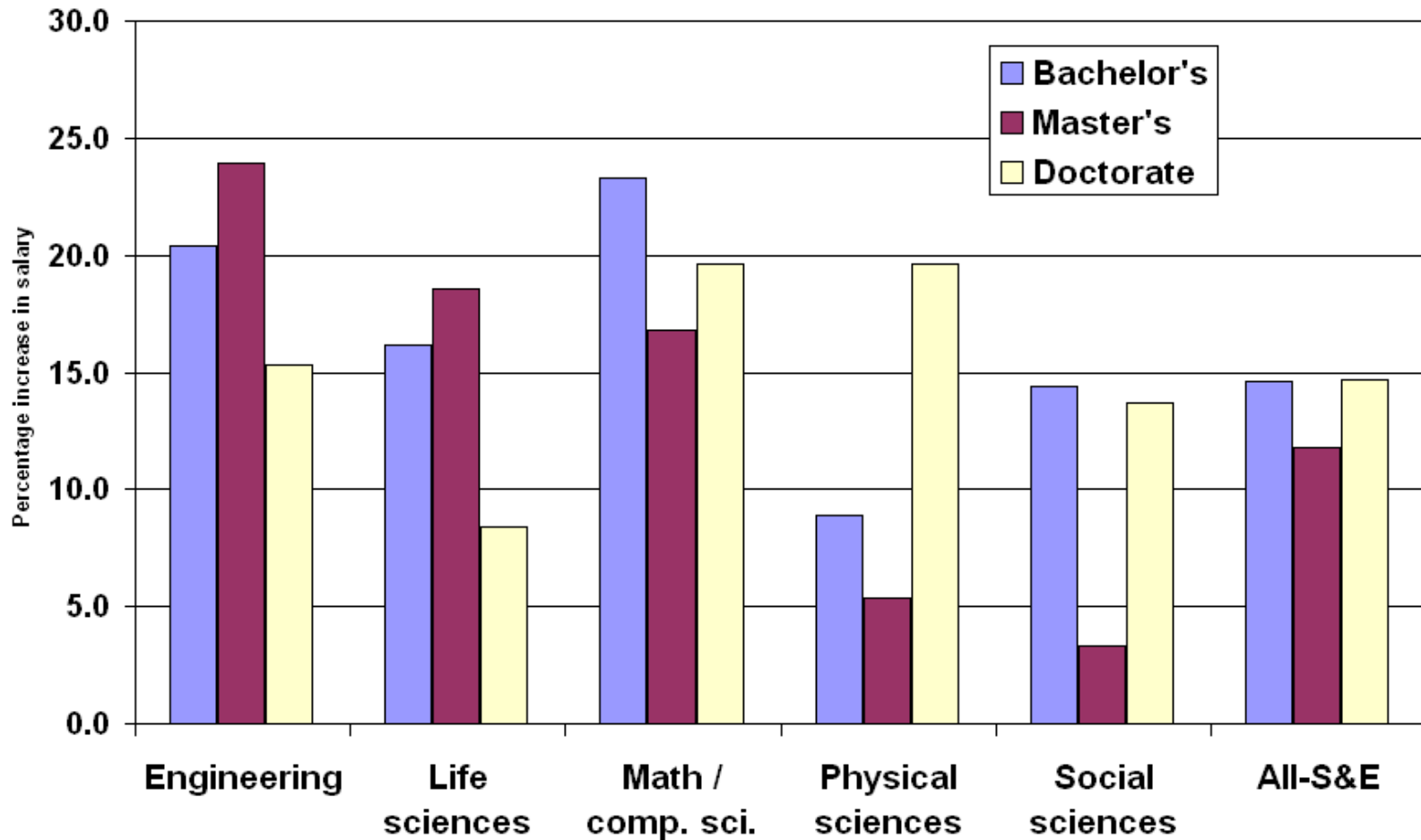


The “demand” for S&E trained workers is neither directly observed or easily measured.

Changes in salary and unemployment do provide indicators of demand relative to supply



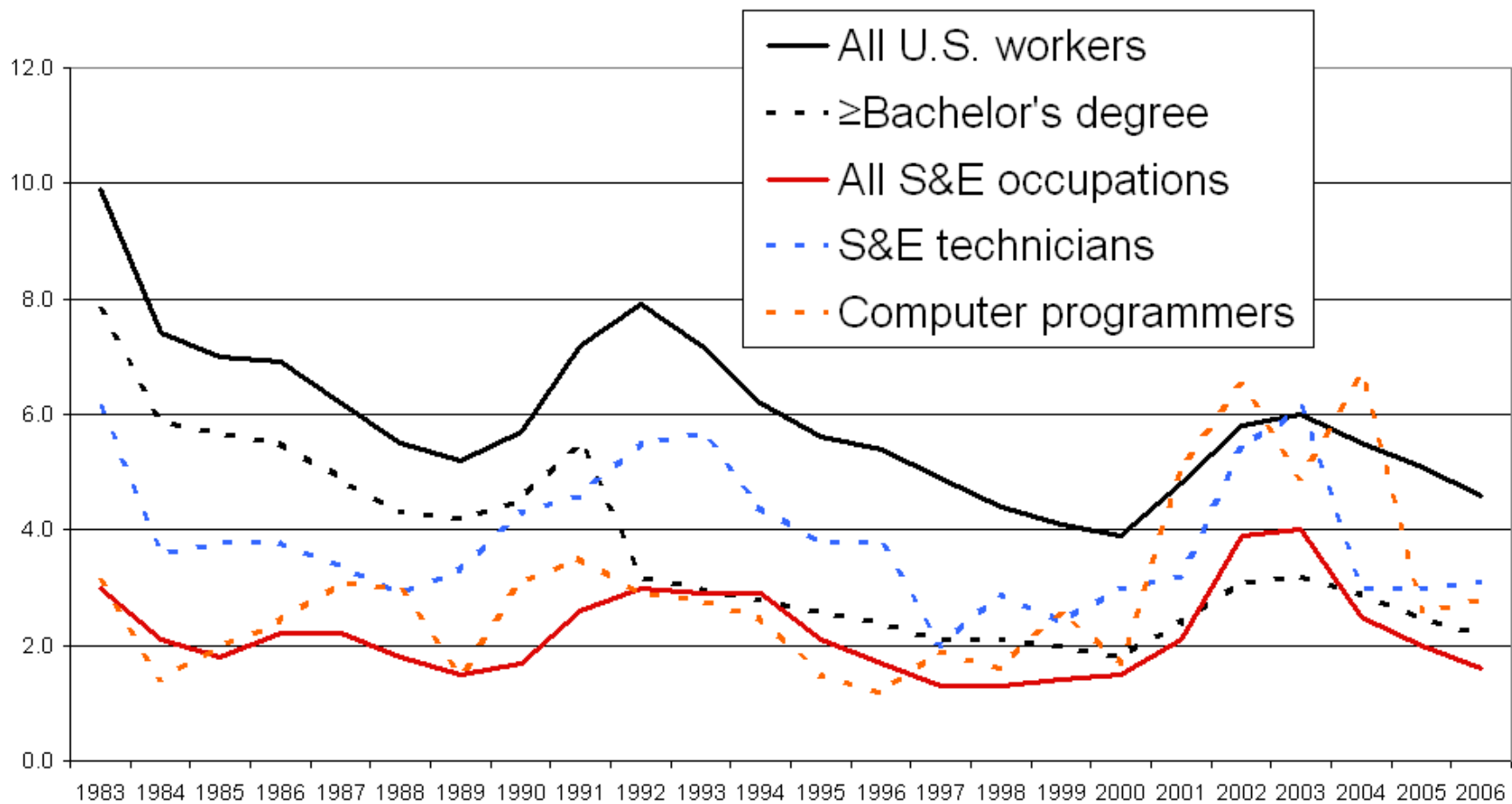
S&E pay is rising: Change between 1993 and 2003 in mean inflation adjusted salary for those earning a S&E degree in previous 1-5 years



Source: Science and Engineering Indicators 2008



Unemployment rate for S&E and other occupations: 1983-2006





Unemployment rate for individuals in S&E occupations, by
sex, race/ethnicity, and visa status: 1993 and 2003
(Percent)

Characteristic	1993	2003
All with S&E occupations	2.6	3.9
Male	2.7	3.7
Female	2.1	4.2
White	2.4	3.4
Asian/Pacific Islander	4.0	6.0
Black	2.8	5.3
Hispanic	3.5	2.7
Temporary residents	4.8	2.1

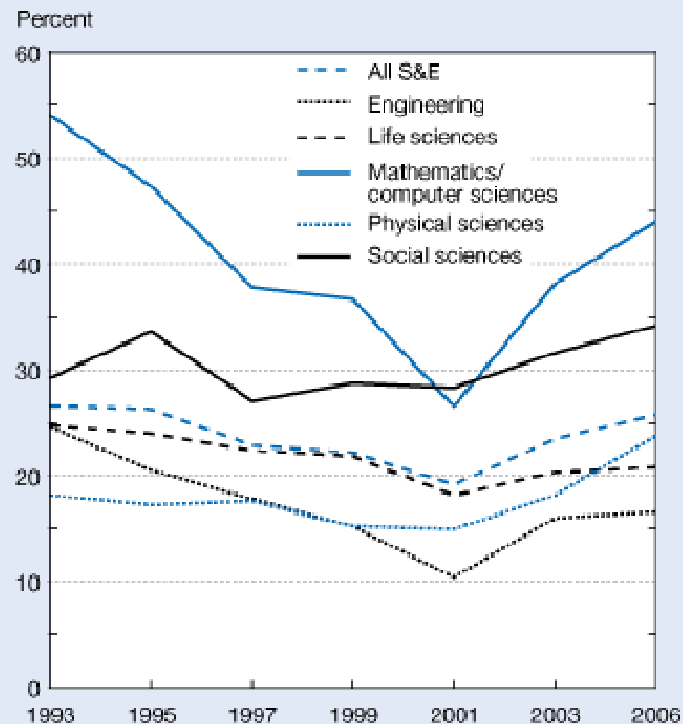
NOTE: 2003 data includes some individuals with multiple races in each category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1993 and 2003, <http://sestat.nsf.gov>.



While most S&E doctorate recipients do not have academic careers, more have been attaining tenure-track positions

Figure 3-33
Doctorate recipients holding tenure and tenure-track appointments at academic institutions 4–6 years after degree, by field: 1993–2006



NOTE: Two-year institutions not included. Doctorate recipients in health fields included in life sciences for consistency with prior years.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, 1993, 2003, and 2006 (preliminary data for 2006).

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Resources:

NSF Division of Science Resources Statistics:

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