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GAO

Fact Sheet to the Vice Chairman, Subcommittee on Economic Goals and Intergovernmental Policy, Joint Economic Committee Congress of the United States

February 1986

PLANS OF FOREIGN Ph.D. CANDIDATES

Postgraduate Plans of U.S. Trained Foreign Students in Science/Engineering

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION

February 19, 1986

B-221997

The Honorable Lloyd Bentsen
Vice Chairman
Subcommittee on Economic Goals
and Intergovernmental Policy
Joint Economic Committee

Dear Mr. Vice Chairman:

In response to your letter of September 23, 1985, we are providing information on whether foreign students who earn Ph.D.'s in the United States in scientific or engineering fields remain in the United States after receiving their doctorates.

As agreed with your office, we have summarized key points in a National Science Foundation (NSF) report, Foreign Citizens in U.S. Science and Engineering: History, Status and Outlook. The NSF report is based on information NSF obtains from an annual questionnaire that all Ph.D. candidates in the sciences and engineering are requested to fill out when they have completed their doctoral requirements. An NSF official told us that the response rate to this questionnaire is more than 99 percent. The NSF data indicates that, for all science and engineering fields

--many foreign students remain in the United States after receiving a Ph.D.,

--foreign students are remaining in the United States at increasing rates, and

--foreign students are an increasing portion of Ph.D. candidates.

We will provide copies of this fact sheet to the National Science Foundation and make copies available to others upon request. Should you have further questions regarding the attached information, please call me at (202) 275-7783.

Sincerely yours,

Sarah P. Frazier

Sarah P. Frazier
Associate Director

POSTGRADUATE PLANS OF FOREIGN PH.D. CANDIDATES IN SCIENCE AND ENGINEERING FIELDS

BACKGROUND

The information in this fact sheet uses data from a National Science Foundation (NSF) report, Foreign Citizens in U.S. Science and Engineering: History, Status and Outlook.[1] We did not collect other information, nor attempt to verify the NSF data. The NSF report is based on information NSF obtains from an annual questionnaire that all Ph.D. candidates in the sciences and engineering are requested to fill out when they have completed their doctoral requirements. An NSF official told us that the response rate to this questionnaire is more than 99 percent. In 1984, 56 percent of the foreign students responding to this questionnaire had firm plans either to remain in the United States, or to leave the United States. The remaining 44 percent either had no plans, or had firm plans but did not know where they would be located, and so are not included in the following information. The NSF data divides foreign students into those having permanent visas (immigrants) and those having temporary visas. We have used that data to report on three groups of Ph.D. candidates. The first group contains all science and engineering fields together.[2] The second and third groups, engineering and computer science, are subsets of the first group.

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[1] Foreign Citizens in U.S. Science and Engineering: History, Status and Outlook (NSF 86-305) (Washington, D.C., 1985)

[2] Includes: Physical Sciences, Physics/Astronomy, Chemistry, Earth/Environmental/Marine Sciences, Mathematics, Computer Science, Life Sciences, Social Sciences, Psychology, and Engineering.

Table 1: Foreign Doctoral Candidates With Firm Post-Graduation Plans to Remain in the United States

	Permanent visas	Temporary visas	All foreign doctoral candidates
	percent		
Total All Science and Engineering			
1972	87	29	51
1984	96	53	60
Engineering[a]			
1972	87	32	60
1984	96	61	68
Computer Science[a]			
1972	b	b	b
1984	92	76	79

[a]"Engineering" and "Computer Science" are also contained in the data for the larger group of fields "Total All Science and Engineering."

[b]Not available.

Source: NSF.

THE MAJORITY OF FOREIGN SCIENCE AND ENGINEERING PH.D. CANDIDATES PLAN TO REMAIN IN THE UNITED STATES

As table 1 shows, of those who have firm plans, the majority (60 percent) of foreign students who are trained in the United States at the doctoral level in the sciences or engineering plan to remain in this country after receiving their Ph.D.'s. Foreign engineering and computer science students remain at even higher rates, 68 and 79 percent, respectively.

In 1984, 96 percent of the students with firm plans who received a Ph.D. in one of the sciences or in engineering, and who had a permanent visa, planned to remain in the United States. Of the students with firm plans holding temporary visas, 53 percent planned to remain in the United States.

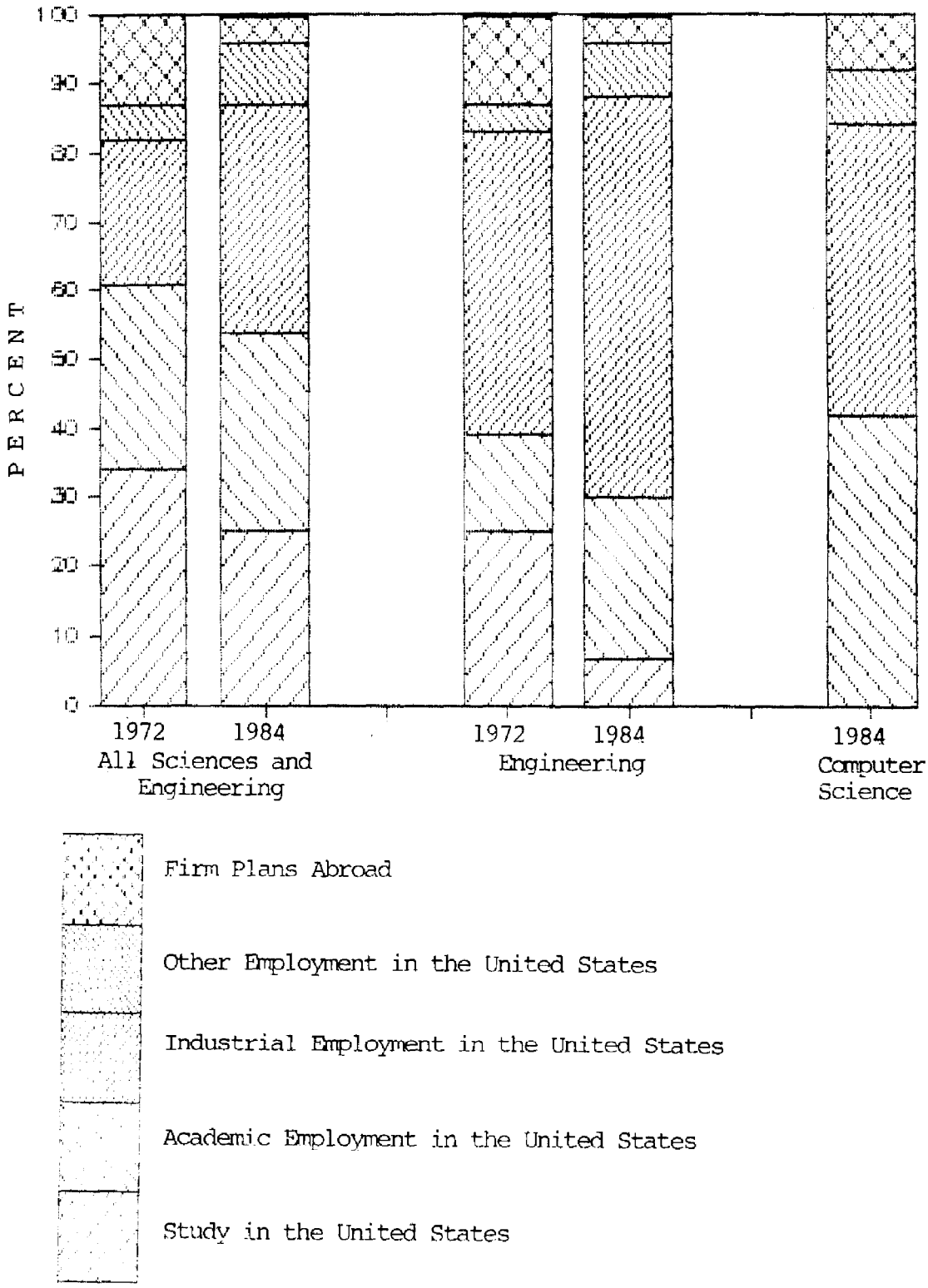
THE PERCENT OF FOREIGN SCIENCE AND ENGINEERING PH.D. CANDIDATES WHO PLAN TO REMAIN IN THE UNITED STATES HAS INCREASED OVER TIME

Table 1 shows that an increasing percentage of foreign students plan to remain in the United States. Using the period between 1972 and 1984 for comparison, the percentage for all science and engineering fields together, and for engineering separately, has increased. The increase in foreign Ph.D. candidates planning to remain in the United States has been most marked among temporary visa holders, from 29 percent to 53 percent for all science and engineering fields, and from 32 percent to 61 percent for engineering. Although data for computer science is not available for 1972, it is notable that 76 percent of temporary visa holders who were computer science Ph.D. candidates in 1984 plan to remain in the United States.

As figures 1 and 2 on the following pages show, NSF accounts for much of this increase through employment with academic, industrial, or other U.S. institutions.

FIGURE 1

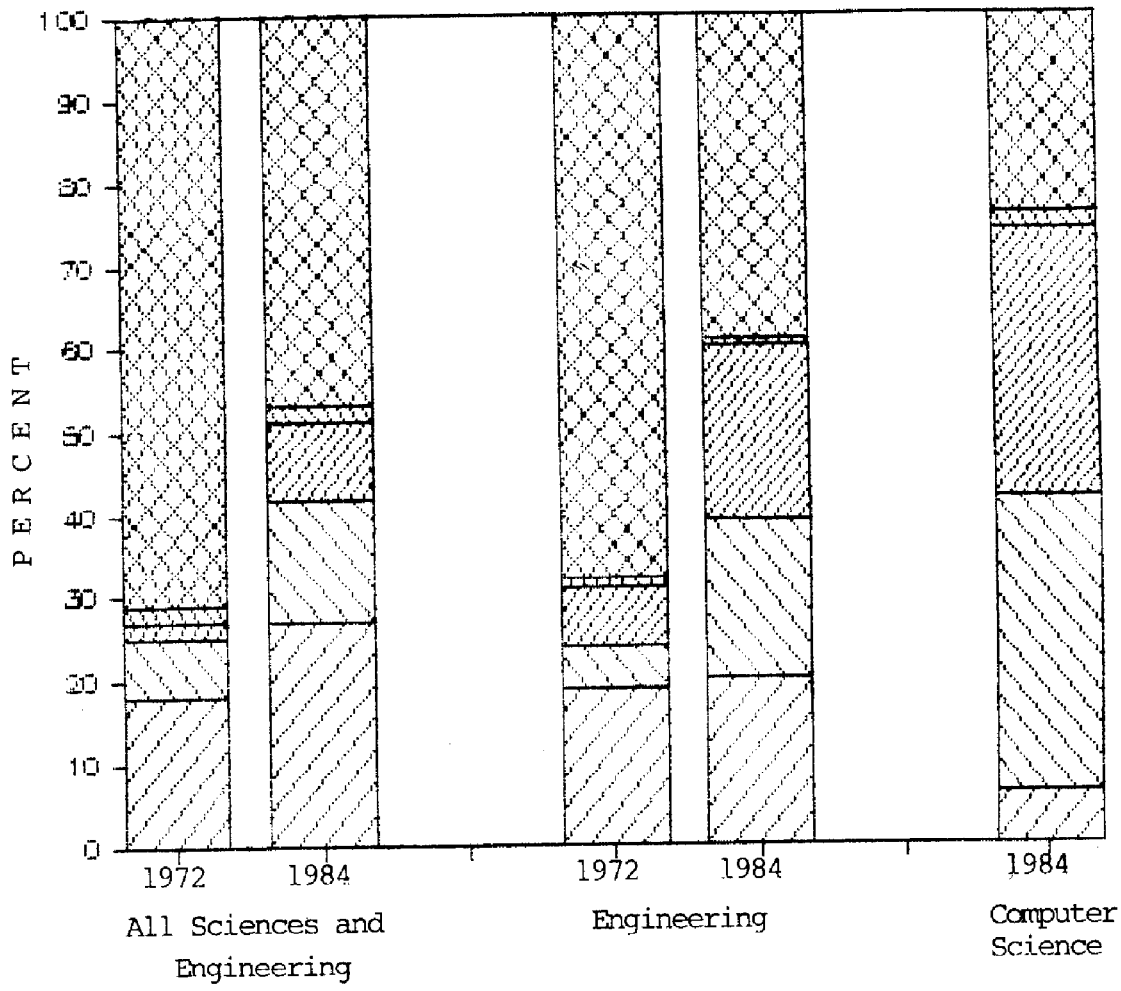
POST-GRADUATION PLANS OF FOREIGN DOCTORAL CANDIDATES WITH PERMANENT VISAS

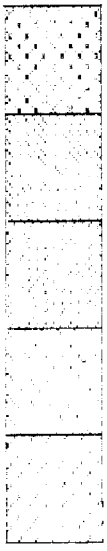


Source: NSF

FIGURE 2

POST-GRADUATION PLANS OF FOREIGN DOCTORAL CANDIDATES WITH TEMPORARY VISAS





Firm Plans Abroad

Other Employment in the United States

Industrial Employment in the United States

Academic Employment in the United States

Study in the United States

Source: NSF

Table 2: Proportions of United States Citizen and Foreign Ph.D. Candidates in Science and Engineering

	Foreign citizens						United States citizens	
	Permanent visa		Temporary visa		Total		Total	
	Percent	(No.)	Percent	(No.)	Percent	(No.)	Percent	(No.)
Total Science and Engineering								
1964	4	(367)	13	(1,182)	17	(1,549)	83	(7,494)
1972	9	(1,624)	12	(2,169)	20	(3,793)	80	(14,907)
1984	5	(816)	21	(3,604)	26[a]	(4,420)	75[a]	(12,941)
Computer Sciences								
1977[b]	4	(1)	11	(3)	14	(4)	86	(24)
1984	6	(17)	31	(89)	37	(106)	63	(177)
Engineering								
1964	7	(109)	15	(247)	22	(356)	78	(1,288)
1972	18	(622)	15	(519)	33	(1,141)	67	(2,330)
1984	10	(274)	46	(1,268)	56[a]	(1,542)	45[a]	(1,240)

[a]Due to rounding, total does not equal 100 percent.

[b]Data on Computer Science as a field is not available before 1977.

Source: NSF.

THE PERCENT OF SCIENCE AND ENGINEERING PH.D. CANDIDATES WHO ARE FOREIGN HAS INCREASED OVER TIME

While most foreign students with firm plans do plan on remaining in the United States, it is also the case that the proportion of foreign students who are candidates for Ph.D.'s in science and engineering has increased over the last two decades. Table 2 compares the percentage of U.S. Science and Engineering Ph.D. candidates to foreign Science and Engineering Ph.D. candidates. In addition, it shows the breakdown between foreign students with permanent visas and those with temporary visas.

In all science and engineering fields, the percent has risen from 17 percent to 26 percent between 1964 and 1984. In engineering, it has risen from 22 percent to 55 percent between 1964 and 1984. And, in computer science, it has risen from 14 percent to 37 percent between 1977 (the first year data was separately collected) and 1984.

Most of the foreign Ph.D. candidates in the United States are on temporary visas. For example, in 1984, 26 percent of the science and engineering doctoral degrees granted went to foreign students, 21 percent to students on temporary visas, and 5 percent to students on permanent visas.

Students on a permanent visa are a smaller proportion of total foreign students than they were a decade ago, and students on a temporary visa are a steadily increasing percentage of total foreign students.

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