



by Alan I. Rapoport

# WHAT IS THE DEBT BURDEN OF NEW SCIENCE AND ENGINEERING PH.D.S?

Division of Science Resources Studies

## ISSUE BRIEF

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*Foreign S&E Ph.D. recipients were less likely to be in debt and had smaller levels of debt than U.S. citizens.*

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Discussions about Government support for graduate education in science and engineering (S&E) often involve questions about graduate students' indebtedness. However, little has been reported about the amount and distribution of graduate student debt. This paper provides information about the indebtedness of new doctorate recipients from their undergraduate and/or graduate education: tuition and fees; living expenses and supplies; and transportation to and from school.

between \$10,000 and \$20,000). Another 5-6 percent reported debt levels of \$20,000 to \$30,000, and 6-8 percent had debts exceeding that amount.<sup>3</sup> From 1993-96, available data indicate the possibility of a slight decline in the percentage with a debt of \$20,000 or less, accompanied by a slight increase in the \$20,000-and-above categories, change that may simply reflect the effects of inflation since debt categories were not adjusted for its effects.

### What was the level of indebtedness of 1993-96 S&E Ph.D.s?

Just under half of those who received their S&E<sup>1</sup> Ph.D.s from 1993-96<sup>2</sup> reported having no debt at the time their degrees were conferred (table 1). An additional one-third reported total debt burdens of \$20,000 or less (19-22 percent had debt up to \$10,000, and 11-12 percent had debt

### Differences between U.S. citizens and foreign Ph.D. recipients

There were significant differences between the debt situations of U.S. citizens and those of foreign Ph.D. recipients (table 1). U.S. citizens were more likely to report at least some debt, and to owe larger amounts, than foreign students (who are usually ineligible

**Table 1. Indebtedness of new S&E Ph.D.s, by citizenship status: 1993-96**

All S&E Ph.D.s					
Year of Ph.D.	No Debt	<10K	10K-20K	20K-30K	>30K
1993.....	48%	22%	12%	6%	6%
1994.....	49	21	11	5	6
1995.....	49	20	11	6	7
1996.....	48	19	11	6	8

U.S. Citizen S&E Ph.D.s					
Year of Ph.D.	No Debt	<10K	10K-20K	20K-30K	>30K
1993.....	38%	28%	17%	7%	7%
1994.....	39	27	16	7	7
1995.....	39	25	16	8	8
1996.....	39	23	15	8	9

Foreign S&E Ph.D.s					
Year of Ph.D.	No Debt	<10K	10K-20K	20K-30K	>30K
1993.....	62%	13%	5%	3%	5%
1994.....	63	13	5	3	5
1995.....	62	13	5	3	5
1996.....	61	13	5	2	6

**NOTE:** Percentages do not total to 100 due to omission of non-respondents from table.

**SOURCE:** National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, various years, unpublished tabulations.

<sup>1</sup> S&E includes the physical sciences, mathematical sciences, computer sciences, environmental sciences, life sciences (including medical and health sciences), social sciences, psychology, and engineering.

<sup>2</sup> The choices that could be selected by respondents to characterize their debt positions have been identical since 1993. A number of changes were made in earlier surveys that do not permit comparisons of data from those surveys with data from the 1993-96 period.

<sup>3</sup>The remainder—7-8 percent—failed to furnish this information.

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for U.S. Government guaranteed and deferred loans). Among 1993-96 doctorate recipients with U.S. citizenship, only 38-39 percent reported being free of debt, compared to 61-63 percent of those without U.S. citizenship. Fourteen to 17 percent of U.S. citizens reported debt burdens exceeding \$20,000, 38-45 percent reported debt of less than \$20,000; for foreign Ph.D. recipients, comparable percentages were 8 and 18 percent, respectively.

**Does primary mode of support influence debt levels?<sup>4</sup>**

Among U.S. citizens earning S&E Ph.D.s during 1993-96, almost half whose primary mode of support was either fellowships or self-support reported no debt. Just over one-third of those with other mechanisms of support reported being debt-free: 37 percent of those with research assistantships or traineeships and 33 percent of those on teaching assistantships. Fellowship holders also had the smallest share of U.S. citizen S&E Ph.D. recipients—7 percent—with debt exceeding \$20,000, compared with an overall average of 15 percent. Twenty-two percent of self supported students were in this category as well (figure 1).

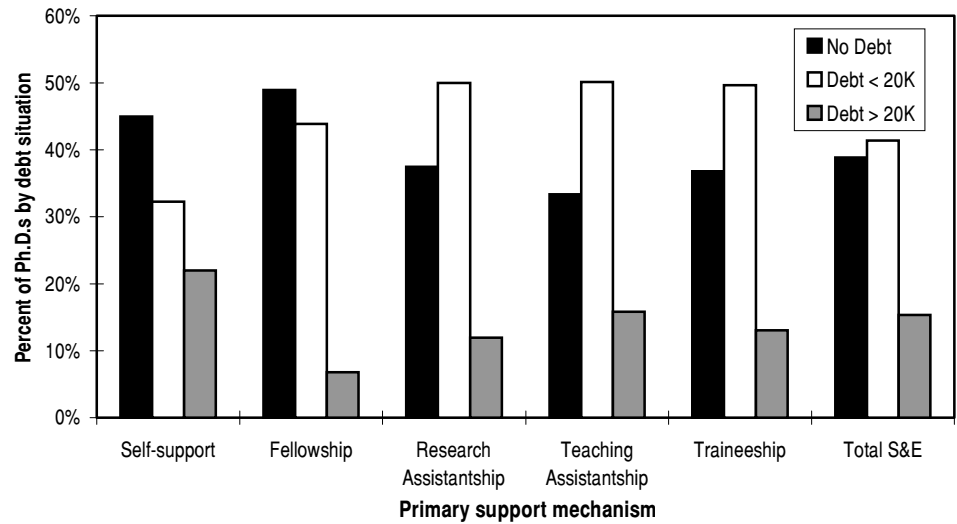
Within the self-support group, there are two distinct categories of individuals—those supported primarily by their own, spousal, or family contributions and those supported primarily by loans. Only 11 percent of the self-support group reported that loans were their primary resource, but of that segment, only 1 percent reported no debt and 84 percent had debts exceeding \$20,000. Of those supported by family contributions or their own resources, half had no debt and only about 15 percent had debts exceeding \$20,000.

**Do S&E Ph.D.s incur greater debt burdens than those in other fields?**

Overall, U.S. citizen Ph.D. recipients in fields other than science and engineering appear to have less debt than those in S&E fields. For example, 48 percent of U.S. citizens who received Ph.D.s in fields other than science and engineering between 1993 and 1996 reported having no debt at the time of graduation, compared to 39 percent of U.S. citizen S&E Ph.D. recipients (table 2). In addition, a higher percentage of the latter group (8 percent) had debts exceeding \$30,000 than those who received Ph.D.s in other subjects (6 percent).

*Those receiving doctoral degrees in non-S&E fields were less likely to be in debt than those receiving degrees in S&E fields.*

**Figure 1. Indebtedness of 1993-96 U.S. citizen S&E Ph.D.s, by primary support mechanism**



**NOTE:** Includes all S&E Ph.D.s conferred between 1993 and 1996.  
**SOURCE:** National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, various years, unpublished tabulations.

<sup>4</sup>This section and the next deal with U.S. citizens only. For both sections, data for the 1993-96 period are pooled together because they appear relatively stable from year to year.

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**Table 2. Indebtedness of 1993-96 U.S. citizen Ph.D.s, by broad field**

Ph.D. field	No Debt	<10K	10K-20K	20K-30K	>30K
All Fields.....	43%	24%	14%	7%	7%
S&E Fields.....	39	26	16	8	8
Agricultural Sciences.....	39	28	16	7	4
Biological Sciences.....	38	29	17	7	6
Computer Sciences.....	55	23	9	4	4
Engineering.....	50	25	13	5	3
Environmental Sciences.....	44	29	16	5	3
Mathematical Sciences.....	49	27	13	4	3
Medical/Health Sciences.....	46	23	12	7	6
Physical Sciences.....	38	32	17	6	3
Psychology.....	27	19	16	12	19
Social Sciences.....	37	24	18	9	8
Non-S&E Fields.....	48	21	12	7	6
Architecture.....	28	26	19	12	10
Arts & Humanities.....	38	25	17	9	7
Business.....	41	18	14	10	12
Education.....	56	18	9	6	5
Law.....	35	16	16	5	11
Library Sciences.....	37	23	15	11	9
Other.....	50	19	12	8	6
Science Education.....	56	20	11	6	5

**NOTE:** Percentages do not total to 100 due to omission of non-respondents from table.

**SOURCE:** National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, various years, unpublished tabulations.

It is interesting to note that one S&E field, psychology, stands out from the rest in terms of student debt. Without psychology, the overall S&E numbers would look more similar to those for other fields. Nineteen percent of the students who received doctorates in psychology reported debts exceeding \$30,000 at the time of graduation, more than double the percentage of the next highest group—those with degrees in the social sciences, 8 percent of whom reported debts exceeding \$30,000. In addition, psychology students were the least likely S&E Ph.D. recipients to report no debt at the time of graduation.

Among those who received doctoral degrees in the sciences and engineering, computer science, engineering, and mathematics majors appear to be in the best debt situation at the time of graduation—55 percent of the computer scientists and about half the engineers and mathematicians reported no debt at the time of graduation, and only 3-4 percent of these former students owed more than \$30,000.

In fields other than science and engineering, those who majored in education appear to be the least debt-burdened—56 percent had no debt at the time of graduation and only 5 percent reported debts exceeding \$30,000. In contrast 10 percent or more of the Ph.D. recipients in three fields—business, architecture, and law—reported owing more than \$30,000 at the time of graduation. In addition, architecture students were the least likely recipients to report no debt at the time of graduation.

A number of other factors not examined here but for which SRS survey data may be informative may affect the overall indebtedness of newly conferred Ph.D.s. These include: marital status; number of dependents; parents' highest educational attainment; age at time of degree; demographic factors such as gender and race/ethnicity; and the types of academic institutions attended.

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**SOURCE:** The source of data for this issue brief is the Survey of Earned Doctorates, which is an annual survey designed to obtain data on the number and characteristics of individuals receiving research doctoral degrees from U.S. institutions, including information on indebtedness.

This Issue Brief was prepared by:

**Alan I. Rapoport**  
**Division of Science Resources Studies**  
**National Science Foundation**  
**4201 Wilson Boulevard, Suite 965**  
**Arlington, VA 22230**  
**703-306-1776 ext. 7208**  
**E-mail: arapopor@nsf.gov**

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