

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The Demand and Supply of Scientific Personnel

Volume Author/Editor: David M. Blank and George J. Stigler

Volume Publisher: UMI

Volume ISBN: 0-87014-061-2

Volume URL: <http://www.nber.org/books/blan57-1>

Publication Date: 1957

Chapter Title: ANALYSIS OF BATES OF TRANSFER OUT OF THE ENGINEERING PROFESSION FOR ENGINEERS WITH VARYING YEARS OF EXPERIENCE

Chapter Author: David M. Blank, George J. Stigler

Chapter URL: <http://www.nber.org/chapters/c2672>

Chapter pages in book: (p. 189 - 191)

## APPENDIX G

### ANALYSIS OF RATES OF TRANSFER OUT OF THE ENGINEERING PROFESSION FOR ENGINEERS WITH VARYING YEARS OF EXPERIENCE

IN 1954 a survey was made of the alumni of Stevens Institute of Technology for the purpose of gathering information for a revised Alumni Directory. In this connection, a questionnaire was sent to all alumni whose addresses were known. About three-quarters of the questionnaires were returned. Because of budget limitations, only the questionnaires for each fifth class, starting with 1952 and going back to 1902, were tabulated.

TABLE G-1

Percentage of Stevens Alumni Who Are Currently Engaged in Engineering Work, Classified by Years of Graduation

<i>Class</i>	<i>Total Number of Respondents</i>	<i>Per Cent in Engineering Work</i>
1902	16	75
1907	23	65
1912	27	78
1917	32	75
1922	81	75
1927	73	78
1932	90	76
1937	75	96
1942	90	86
1947	73	84
1952	160	86
Total	740	82

Source: "A Report on Engineering Careers," a reprint from *Stevens Indicator*, Stevens Institute of Technology, October 1954, Table IA, p. 8.

One of the questions related to whether the respondent was currently engaged in engineering work. The data collected on this question are shown in Table G-1. We have attempted to use these data to determine whether there is any pronounced tendency for rates of transfer out of the profession to be greater during the

## APPENDIX G

earlier or later portions of an engineer's working life. The results are instructive even though the sample is small and restricted to one institution of higher learning.

One problem involved in analyzing the data relates to the fact that a significant proportion of engineering graduates do not enter the profession upon graduation. Indeed, if we treat all members of graduating classes of engineering schools as part of the supply of engineers (as is commonly done), it appears that the year of greatest loss to the profession is precisely the year of graduation. In Chapter III, we estimate that 5 to 7 per cent of the graduating engineers of the class of 1951 in all colleges did not enter the engineering profession. Apparently, this proportion is higher at Stevens, for 14 per cent of the class of 1952 said they were not engaged in engineering work at the time of the survey.

We are interested here in determining whether the annual rate of transfer out of the profession differs with varying years of experience for those engineers who did enter the profession. Accordingly we have assumed in column 2 of Table G-2 that 10 per cent of the Stevens graduates in each class did not enter the profession upon graduation, and alternatively, in column 3 that 14 per cent did not engage in engineering work upon graduation. The first assumption involves an initial loss to the profession of somewhat greater magnitude than we found for all engineering graduates in 1951 but somewhat smaller than the loss suggested by the data for the Stevens class of 1952. The second assumption is based directly upon the proportion of the Stevens class of 1952 found not working in engineering at the time of the survey. In column 1 we simply disregard the question of initial loss and treat all graduates as if they entered the profession upon graduation.

The data in Table G-2 show the annual average rates of transfer out of the profession for each listed Stevens class, computed successively on the basis of each of the three assumptions as to initial loss. The rates were so derived as to measure the average ratio of each year's loss to the number still remaining in the engineering profession at the beginning of the year. If the true annual rate of loss among older engineers was greater than the rate among younger engineers, we would expect that the average rate for older graduates over their entire working life to date (shown in Table G-2) would be higher than that for recent graduates. The reverse would be expected if transfers were more common among younger engineers.

APPENDIX G

When no account is taken of the initial loss to the profession (column 1), the average rates rise for the more recent classes. But when we roughly take account of initial losses (columns 2 and 3), we find no discernible trend in average rates of transfer when classified by years of experience. Since the sample is small, there is considerable irregularity in the figures. But, except for the most recent classes, there does not seem to be any striking difference among the several classes. And the conclusions for the recent classes are ambiguous since one assumption suggests a higher rate of transfer and the other, a lower.

TABLE G-2

Annual Rates of Transfer Out of the Engineering Profession, Estimated on Basis of Alternative Assumptions as to Proportion of Graduates Never Entering the Profession

YEARS SINCE GRADUATION	AVERAGE ANNUAL RATE OF TRANSFER		
	<i>Assumption A</i> <sup>a</sup> (1)	<i>Assumption B</i> <sup>b</sup> (2)	<i>Assumption C</i> <sup>c</sup> (3)
52	0.55%	0.36%	0.27%
47	0.92	0.70	0.58
42	0.59	0.31	0.22
37	0.78	0.54	0.38
32	0.90	0.62	0.43
27	0.91	0.52	0.35
22	1.24	0.79	0.58
17	0.24	d	d
12	1.25	0.33	0.00
7	2.46	1.03	0.29
2	7.26	2.02	0.00

<sup>a</sup> It is here assumed that all graduates enter the profession upon graduation.

<sup>b</sup> It is here assumed that 10 per cent of each graduating class never enters the profession.

<sup>c</sup> It is here assumed that 14 per cent of each graduating class never enters the profession.

<sup>d</sup> Under the given assumptions, this class would have a negative rate of transfer.

Source: Table G-1.