

Developing and Using a Faculty Flow Model

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Abstract

Systematically tracking retention, tenure, and promotion rates of faculty members is an important management and IR issue at institutions of all types. This presentation highlights the development and use of a faculty flow model that tracks these employment outcomes for multiple faculty cohorts and summarizes the results. Use of the data for an analytic study of significant effects on these variables is also highlighted. A discussion of pragmatic issues of obtaining the necessary data, resolving data anomalies, and dealing with associated campus politics is also included.

Developing and Using a Faculty Flow Model

While a certain degree of faculty turnover is expected (and even desirable in order to provide opportunities to change the foci of academic programs), excessive turnover is costly to institutions in terms of searches, staffing for short-term replacements, start-up packages, and the opportunity costs associated with losing vitality in academic departments (Harrigan, 1999). Perspective faculty members also have a right to know about their chances for success (Eimers, 1995). Tracking the success of women and faculty of color is a particular concern. It is desirable to produce information on faculty turnover at the college level as well as the overall institutional level.

Much more needs to be known, both at the national and institutional levels, about faculty mobility and particularly faculty departure from higher education (Burke, 1991, Matier, 1990). Faculty departure (due to resignation, termination, retirement, and death), receipt of tenure, and promotion in rank are all outcomes of interest in tracking faculty success (Kelly, 1998). While reliable national data about faculty departure, tenure, and promotion rates are not routinely available, some evidence has been provided. Harrigan (1999) reports faculty departure rates after one year of employment at a group of 13 institutions comprised primarily of research universities to be between two and eleven percent. Ehrenberg's (1991) analysis of faculty data collected by the American Association of University Professors revealed departure rates of eight to ten percent for full and associate professors and fourteen to sixteen percent for assistant professors. Eimers (1995) reports tenure rates at research universities between 33% and 72%.

The Office of Institutional Research at Bowling Green State University first began investigating trends in faculty departure, tenure, and rank in 2001 in response to a

request from a Faculty Senate committee. Ten cohorts of new tenure-track assistant professors were tracked through Fall 2000. While this information was useful, it became clear that we needed a systematic tracking approach that was more easily used by the audience, that some data issues needed to be resolved, and that analytical studies of significant predictors of these faculty employment outcomes would also be useful. This paper highlights our development and use of a faculty flow model that responds to these needs.

BGSU's Faculty Flow Model is based on the same concepts as our Student Flow Model. All data manipulations and analyses are done with SAS. New cohorts of tenure-track faculty are extracted from our Faculty Profile database and "frozen" each fall. Data were available from the Fall 1993 semester forward. Two different cohorts are extracted each year: new tenure-track assistant professors and new tenure-track associate professors. The number of faculty members in the second category is much smaller and is zero in some years. Demographic variables in each extract include gender, race/ethnicity, age, and college. Records in each cohort are joined (by identification number) to Faculty Profile databases each subsequent year to determine the employment status (continuing, continuing/faculty improvement leave, continuing/leave without pay, continued/otherwise employed at BGSU, retired/deceased, resigned/terminated), tenure status (tenure-track, tenured, or non-tenure-track (a status in which faculty members who do not receive tenure are placed for their final year of employment)), and academic rank (assistant professor, associate professor, or professor) of each faculty member. Examples of the summary descriptive results of the Faculty Flow Model are shown for the 1993

cohorts of new tenure-track assistant professors (Table 1) and new tenure-track associate professors (Table 2).

We realized that we needed to deal with the situation where some faculty members take a leave of absence and “stop the tenure clock” when calculating tenure rates. To address this, the SAS program skips the leave year and evaluates the tenure and promotion after the seventh year rather than the sixth. The SAS program checked whether there were any annual leaves before the 8th year or between the 8th year and the 12th year. If the leave year occurred before the 8th year and the tenure status was not tenured in the 7th year, SAS would look at the 8th year tenure status and considered it as tenured within 7 years if the tenure status changed from on-track to tenured in the 8th year. The same was true for the promotion of associate professor within 7 years. Should the leave year have happened between the 8th year and the 12th year, SAS would take the 12th year faculty rank of professor as promotion of full professor within 12 years.

With twelve years worth of data, it also became clear that we needed a way to meaningfully summarize the data. The SAS program summarizes the data across cohorts for the employment, tenure, and academic rank outcomes. The results were then exported to Excel and charts were developed to array the results (see Figures 1-13).

We also used logistic regression analyses to uncover significant predictors of these faculty outcomes for new assistant professors at various points in time, both across cohorts and for each cohort. Categorical predictor variables were dummy-coded with White as the referent category for race and Arts and Sciences or Business Administration as the referent category for the colleges. As shown in Table 3, faculty members in the College of Health and Human Services were significantly less likely to be retained after

one year. Faculty members in the Colleges of Education and Human Development and Health and Human Services and African American faculty members were significantly less likely to be retained after three years (see Table 4). Only one significant difference was found within individual cohorts: older faculty members in the Fall 1997 new cohort were more likely to be retained after three years, as shown in Table 5. As shown in Table 6, faculty members in the Colleges of Business Administration, Education and Human Development, and Health and Human Services were significantly less likely to be retained after six years. No significant differences were found in ten-year retention rates (see Table 7). Table 8 shows that faculty members in the Colleges of Arts and Sciences and Technology were significantly more likely to be tenured after six years. Faculty members in the College of Arts and Sciences were significantly more likely to be promoted to associate professor after six years, as shown in Table 9. There were no statistically significant differences in promotion to full professor after ten years (Table 10).

Finally, we had to deal with political issues on campus concerning the utility and availability of this information. The reaction when we presented this information to the Provost and members of his staff was that, while the information was useful and interesting, particularly in view of the fact that there were not large numbers of significant group differences, the information would be more valuable if it included reasons while faculty members departed from the University. Such information, of course, is not included in the Faculty Profile databases and can only be gained anecdotally. With this in mind, we contacted academic departments and obtained this information. The results were arrayed in a non-public web site, an example of which is

shown in Table 11. Numbers of departing faculty in the table provide links to details on reasons for their resignations. Due to some concerns about the integrity of some of the older Faculty Profile data and concerns over the confidentiality of human resources information, it was agreed at this point that the Faculty Flow Model results would not be shared beyond the level of the Provost's Office and the college deans.

References

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Table 3.

Results of Logistic Regression Analysis for Effects on One-Year Retention Rates of New Assistant Professors: Combined Cohorts

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp (B)</u>
College: HHS	-1.53	0.70	4.77*	0.22
Asian Amer.	-1.05	0.73	2.10	0.35
Afr. Am.	-0.98	0.83	1.37	0.38
College: EDHD	-0.73	0.65	1.28	0.48
Age	0.40	0.04	0.99	1.04
College: BA	0.57	1.11	0.26	1.76
Gender	-0.25	0.54	0.21	0.78
Amer. Ind.	18.10	40192.97	0.00	72489672.00
College: MUS	18.00	8459.49	0.00	65661568.00
College: TECH	17.90	9526.31	0.00	59222042.00
Hisp. Amer.	17.58	11710.48	0.00	43234657.00

* p < .05.

Table 4.

Results of Logistic Regression Analysis for Effects on Three-Year Retention Rates of
New Assistant Professors: Combined Cohorts

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp (B)</u>
College: HHS	-1.91	0.53	13.24***	0.22
College: EDHD	-1.13	0.43	6.86**	0.32
Afr. Am.	-1.44	0.57	6.41*	0.24
Gender	-0.55	0.34	2.65	0.58
Age	0.04	0.03	1.95	1.04
College: BA	-0.69	0.53	1.70	0.50
Asian Amer.	-0.36	0.54	0.44	0.70
College: MUS	-0.40	0.72	0.31	0.67
Hisp. Amer.	-0.34	1.14	0.90	0.71
Amer. Ind.	19.43	40192.97	0.00	723000000.00
College: TECH	18.85	10933.67	0.00	154000000.00

* p < .05. ** p < .01. ***p<.001.

Table 5.

Results of Logistic Regression Analysis for Effects on Three-Year Retention Rates of
New Assistant Professors: 1997 Cohort

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp (B)</u>
Age	0.46	0.22	4.29*	1.59
College: HHS	-2.78	2.43	1.30	0.06
Gender	1.17	1.68	0.48	3.21
College: EDHD	-1.20	1.81	0.44	0.30
Asian Amer.	19.57	27411.02	0.00	316000000.00
College: TECH	14.67	40192.97	0.00	2355397.20
College: BA	-7.90	48650.17	0.00	0.00

* $p < .05$.

Table 6.

Results of Logistic Regression Analysis for Effects on Six-Year Retention Rates of New Assistant Professors: Combined Cohorts

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp(B)</u>
College: EDHD	-1.40	0.47	8.84**	0.25
College: HHS	-1.76	0.78	5.11*	0.17
College: BA	-1.15	0.51	5.03*	0.32
Afr. Am.	-1.72	0.89	3.74*	0.18
Age	-0.02	0.03	0.61	0.98
Asian Amer.	0.37	0.66	0.31	1.44
College: MUS	-0.38	0.77	0.24	0.69
College: TECH	0.35	0.88	0.15	1.42
Gender	0.08	0.37	0.05	1.08
Hisp. Amer.	-21.99	28292.93	0.00	0.00
Amer. Ind.	20.08	40192.97	0.00	523000000.00

*p < .05.

** p < .01.

Table 7.

Results of Logistic Regression Analysis for Effects on Ten-Year Retention Rates of New Assistant Professors: 1993 Cohort

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp(B)</u>
College: EDHD	-2.55	1.35	3.53	0.08
College: BA	-1.90	1.02	3.46	0.15
Age	0.11	0.03	0.61	0.98
Afr. Am.	-2.15	1.61	1.72	0.12
Asian Amer.	1.51	1.27	1.41	4.51
College: TECH	-0.89	1.54	0.33	0.41
Gender	0.36	0.85	0.17	1.43
College: HHS	-0.60	1.58	0.14	0.55
College: MUS	-22.66	26919.24	0.00	0.00

Table 8.

Results of Logistic Regression Analysis for Effects on Six-Year Tenure Rates of New Assistant Professors: Combined Cohorts

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp (B)</u>
College: A&S	1.53	0.54	8.17**	4.63
College: TECH	1.75	0.88	3.95*	5.77
College: MUS	1.54	0.85	3.26	4.66
Afr. Am.	-1.36	0.87	2.42	0.26
Age	-0.03	0.03	1.74	0.97
College: EDHD	0.56	0.61	0.84	1.74
Asian Amer.	0.50	0.64	0.61	1.65
Gender	-0.16	0.40	0.19	0.86
College: HHS	0.20	0.86	0.05	1.22
Hisp. Amer.	-21.74	28308.64	0.00	0.00
Amer. Ind.	20.55	40192.97	0.00	843000000.00

*p<.05.

**p<01.

Table 9.

Results of Logistic Regression Analysis for Effects on Six-Year Promotion Rates of New Assistant Professors

Predictor	<u>B</u>	<u>SE</u>	<u>Wald</u>	<u>Exp (B)</u>
College: A&S	1.54	0.54	8.21**	4.66
College: MUS	1.54	0.85	3.26	4.67
College: TECH	1.28	0.85	2.26	3.61
Afr. Am.	-1.36	0.87	2.44	0.26
Age	-0.04	0.03	1.88	0.97
College: EDHD	0.57	0.61	0.88	1.77
Asian Amer.	0.56	0.64	0.78	1.75
Gender	-0.13	0.36	0.12	0.88
College: HHS	0.20	0.86	0.06	1.23
Hisp. Amer.	-21.73	28314.58	0.00	0.00
Amer. Ind.	20.54	40192.97	0.00	829000000.00

**p<01.

Figure 1. One-Year Retention Rates for New Assistant Professors

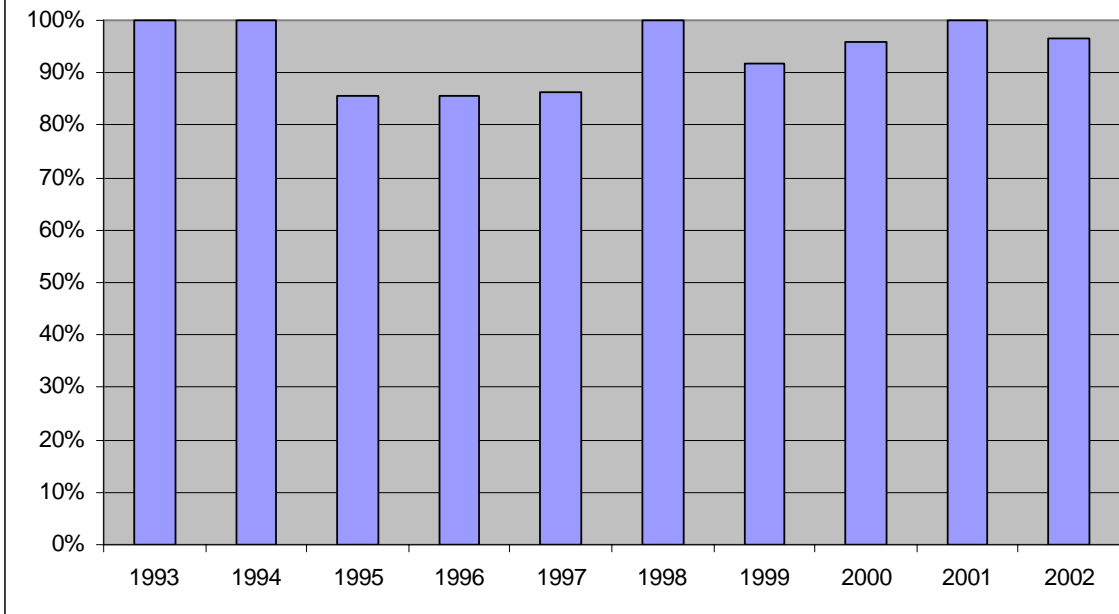


Figure 2. Three-Year Retention Rates for New Assistant Professors

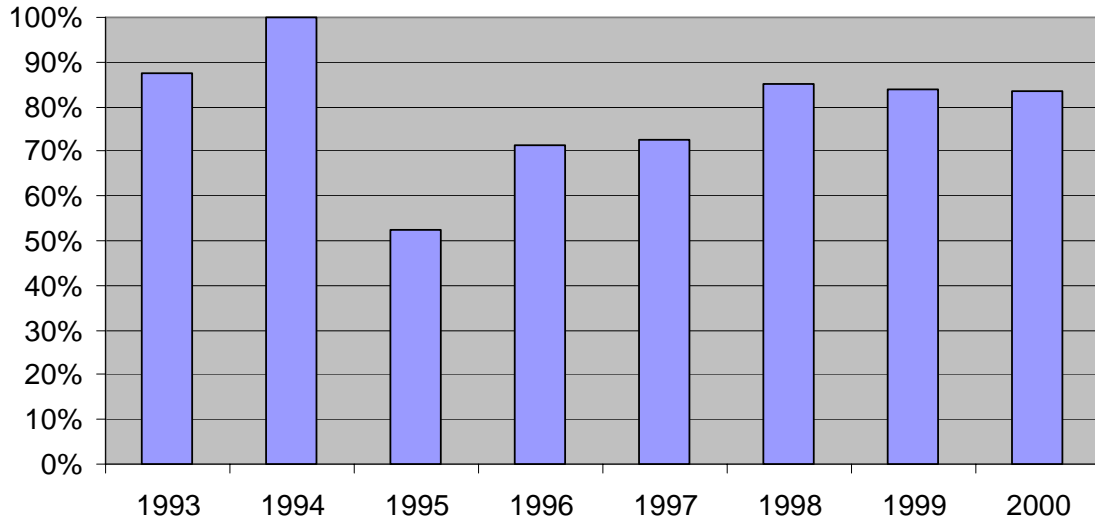
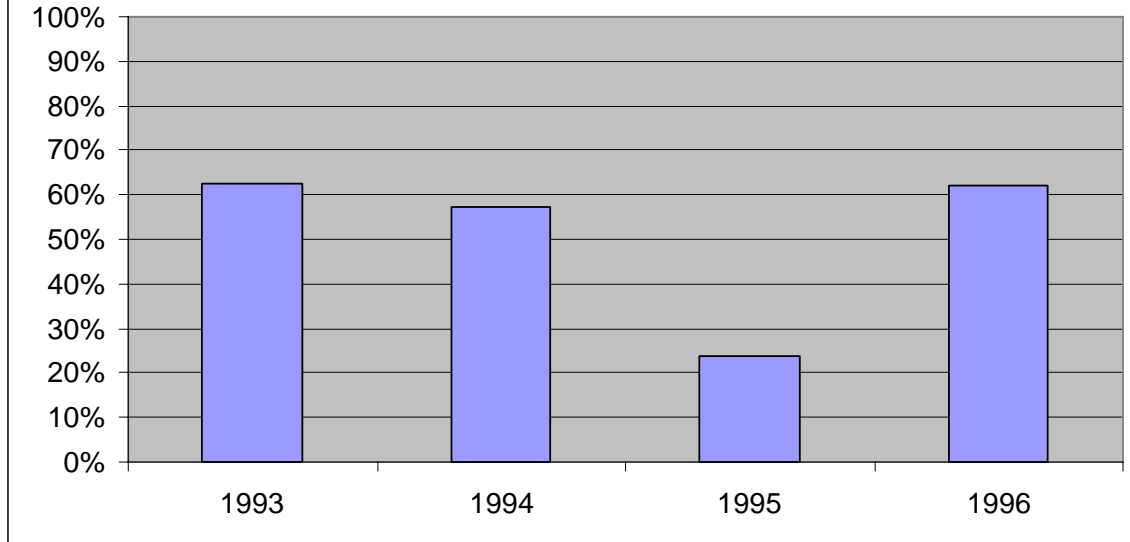


Figure 3. Seven-Year Retention Rates for New Assistant Professors



**Figure 4. Ten-Year Retention Rates for New Assistant Professors-
-1993 Cohort**

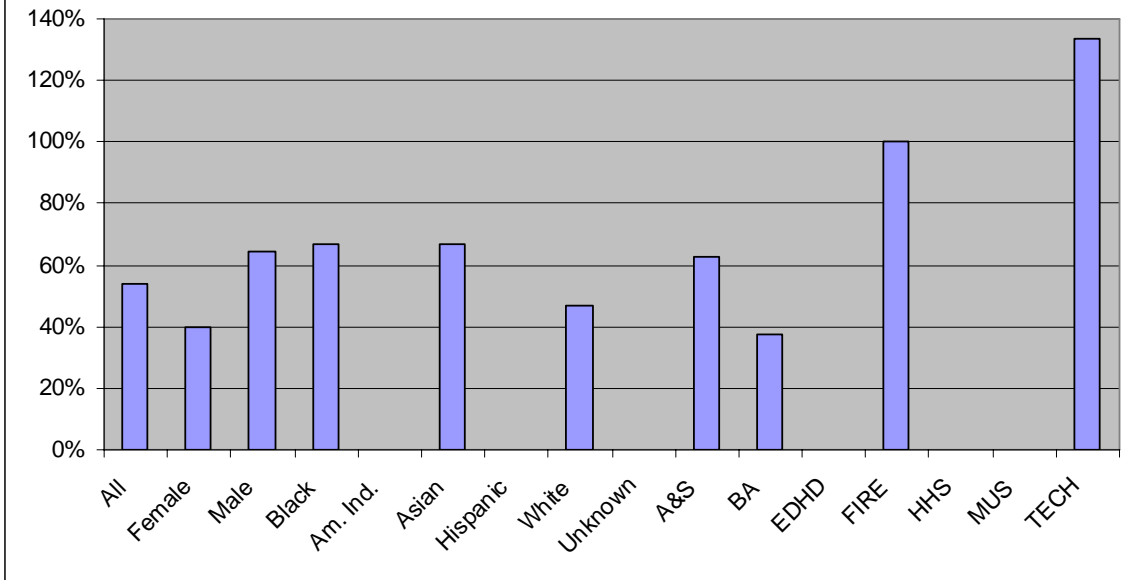
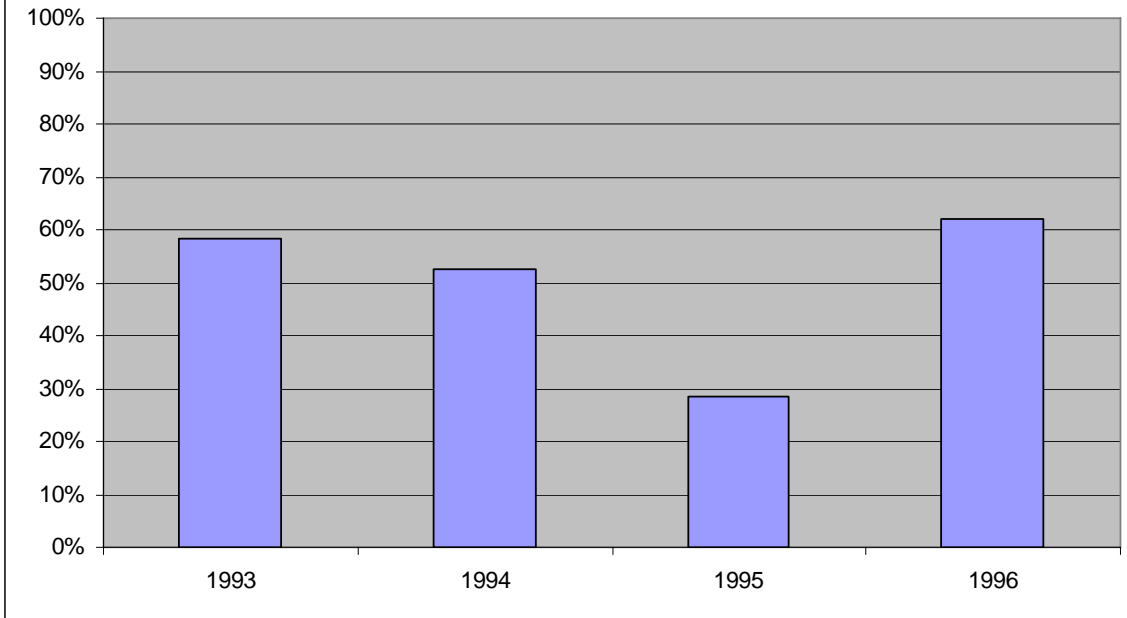


Figure 5. Seven-Year Tenure Rates for New Assistant Professors



**Figure 6. Seven-Year Rates of Promotion to Associate Professor
for New Assistant Professors**

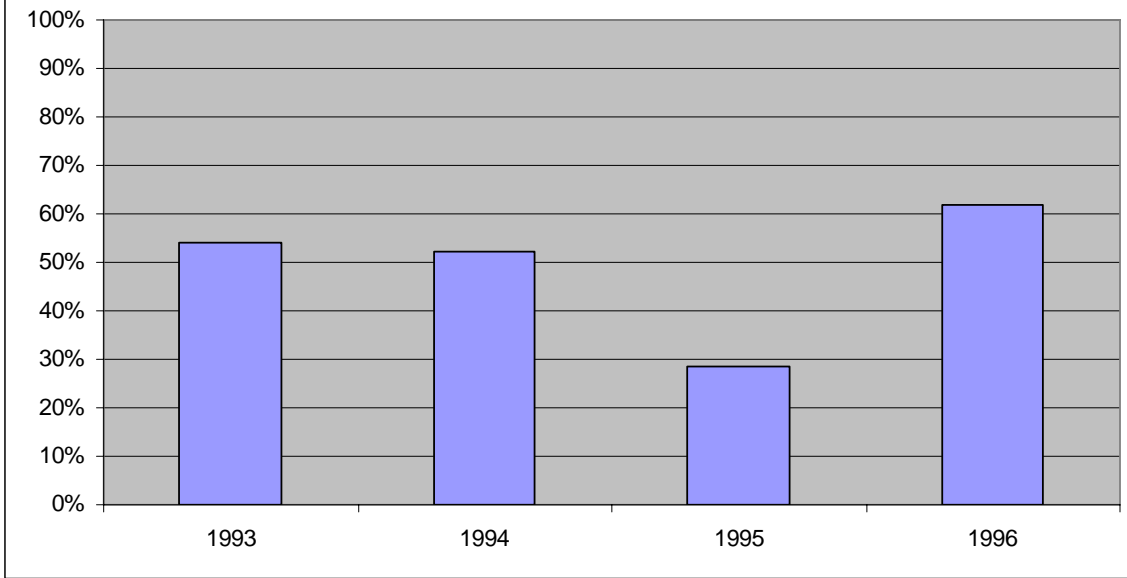


Figure 7. Ten-Year Rates of Promotion to Professor for New Assistant Professors--1993 Cohort

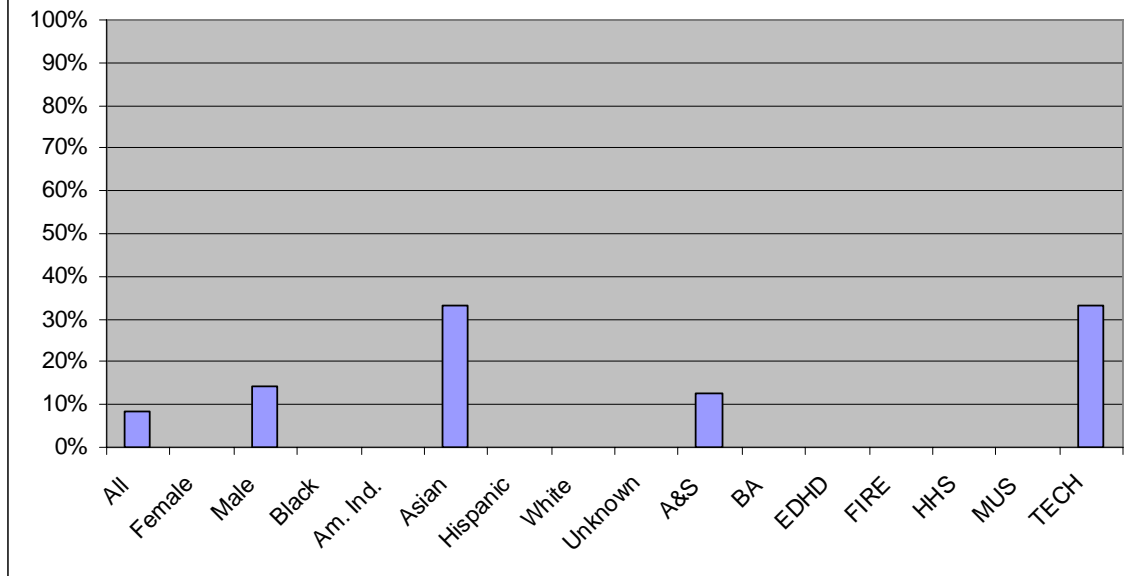


Figure 8. One-Year Retention Rates for New Associate Professors

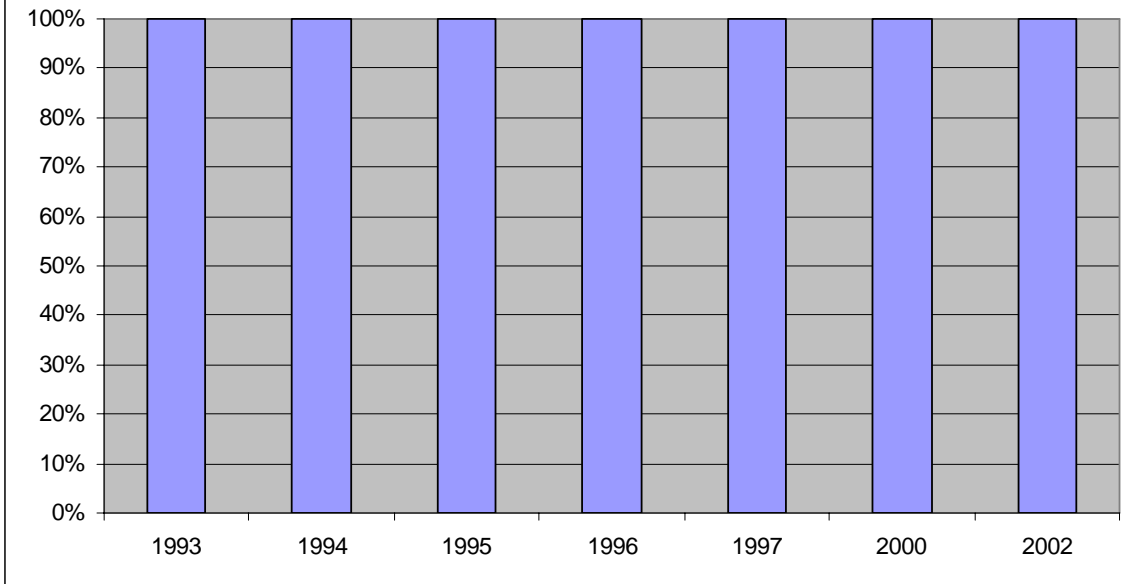


Figure 9. Three-Year Retention Rates for New Associate Professors

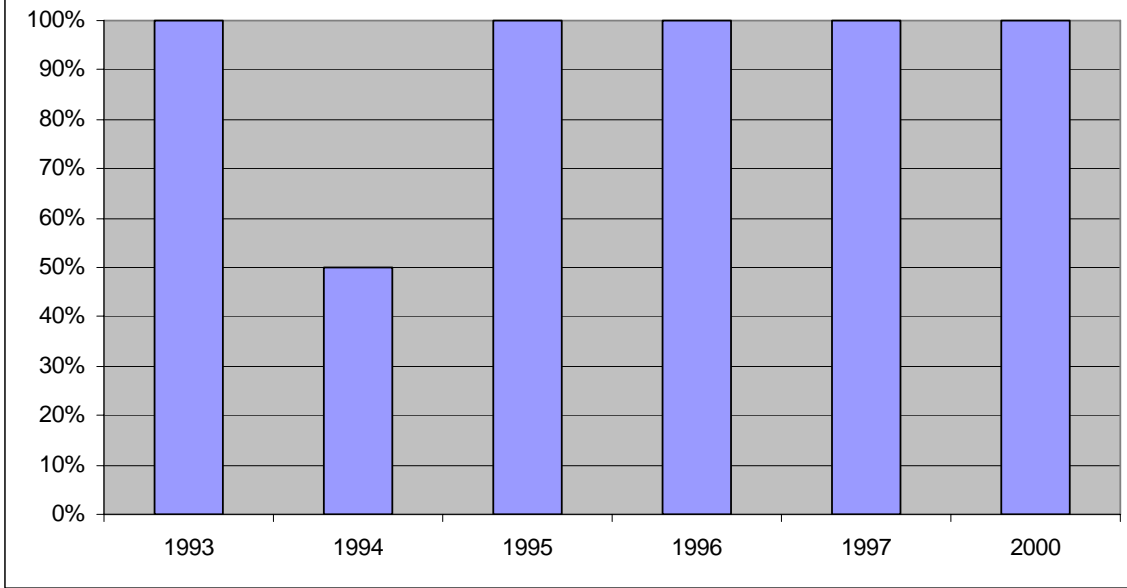


Figure 10. Seven-Year Retention Rates for New Associate Professors

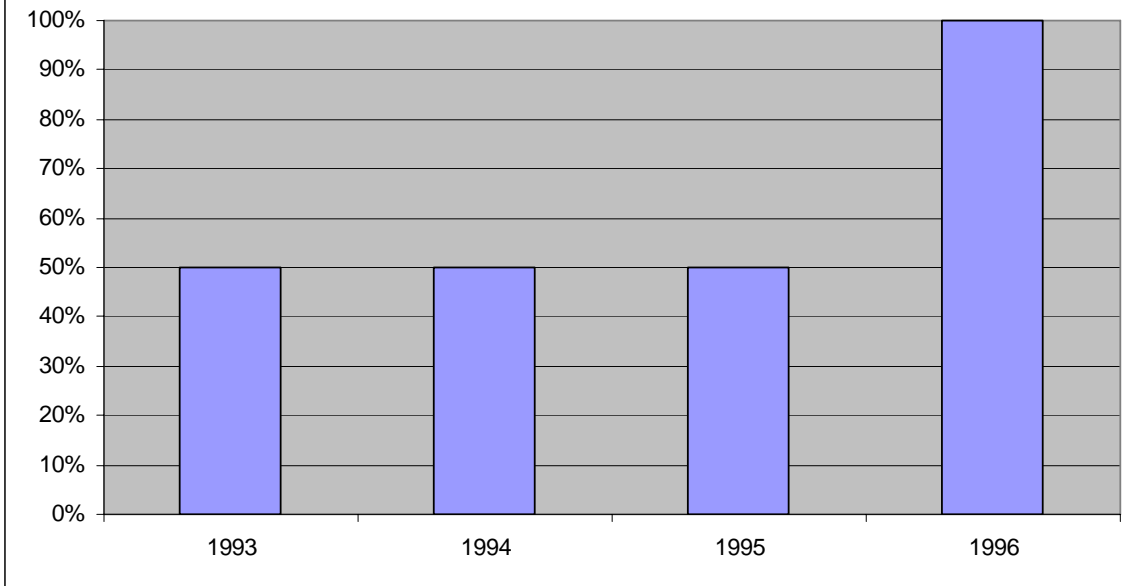


Figure 11. Ten-Year Retention Rates for New Associate Professors--1993 Cohort

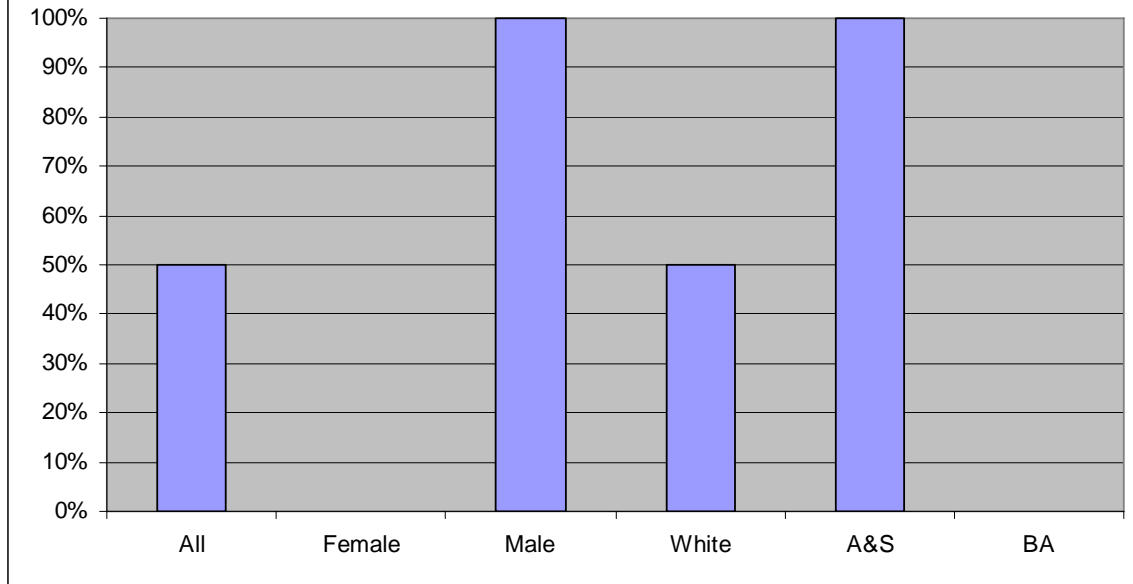


Figure 12. Three-Year Tenure Rates for New Associate Professors

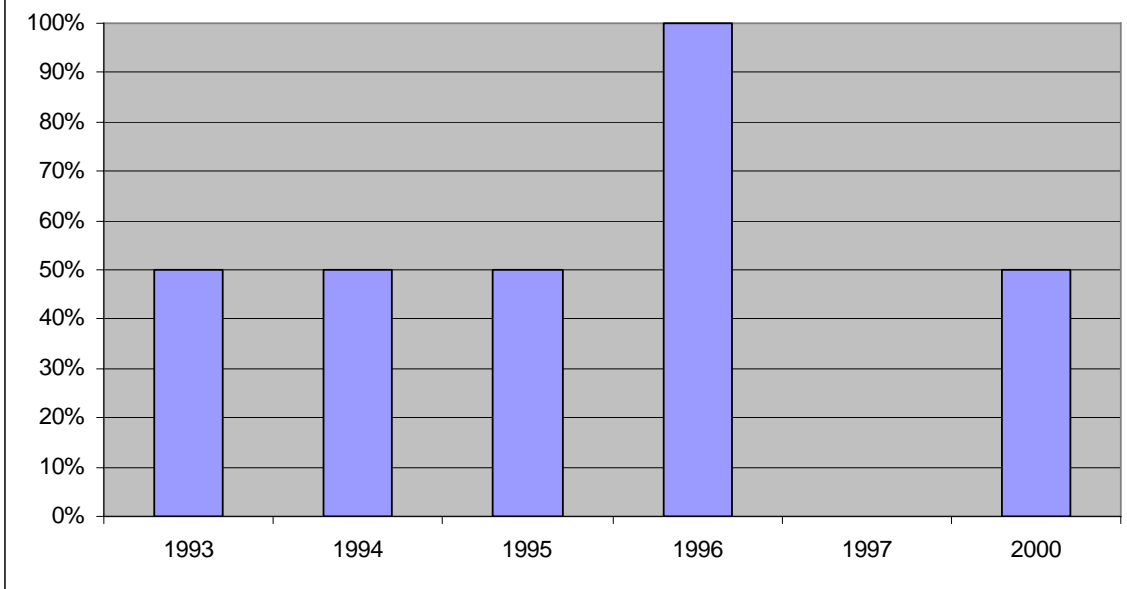


Figure 13. Three-Year Rates of Promotion to Professor for New Associate Professors

