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29th Annual AMS Survey 1985

First Report

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1985

First Report

The following pages contain a first report on the 1985 AMS Survey. Included in this report are salary and other data on faculty members in four-year colleges and universities, a report on the 1985 survey of new doctorates, a report on salaries of new doctorates, and a list of names and thesis titles for members of the 1984-1985 Ph.D. class.

The Annual AMS Survey is conducted in two parts. Questionnaires were distributed in May to departments in the mathematical sciences in colleges and universities in the United States and Canada, and later to the recipients of doctoral degrees granted by these departments between July 1984 and June 1985, inclusive. This report is based on the information collected from these questionnaires. A second round of questionnaires was distributed in September; these are concerned with data on fall enrollments, class size, teaching loads and faculty mobility. These data will be reported in the March 1986 issue of the *Notices*.

This Survey is the twenty-ninth in an annual series begun in 1957 by the Society's Committee on the Economic Status of Teachers. The present Survey is under the direction of the Committee on Employment and Educational Policy (CEEP), whose members are Lida K. Barrett, Stefan A. Burr, Philip C. Curtis, Jr., Lisl Novak Gaal, Gerald J. Janusz, and Donald C. Rung (chairman). The questionnaires were devised by CEEP's Data Subcommittee consisting of Lida K. Barrett, Edward A. Connors, Lincoln K. Durst, Arthur P. Mattuck, James W. Maxwell, Donald E. McClure, and Donald C. Rung (chairman).

Faculty Salaries, Tenure, Women

The questionnaires sent to departments in the mathematical sciences asked for information on salaries and tenure. Departments submitted a minimum, median, and maximum salary figure for each of four academic ranks, for staff members both with and without doctorates. Annual salaries of full-time faculty members for the academic year of 9 or 10 months were sought. The 1985 questionnaire requested information for both the years 1984-1985 and 1985-1986. The sample in this survey is thus the same for both years and is different from the sample used in the Twenty-Eighth AMS Survey in 1984. In the salary tables on the following pages the numbers in parentheses give the range of the middle fifty percent of salaries reported. The figures outside the parentheses represent the minimum and maximum salary listed by any reporting institution. In some categories relatively few departments reported and, because significant figures were not available, salaries are not listed.

The information reported this year on the number of faculty members is based on returns from 639 departments in the mathematical sciences, 127 of which did not contain usable salary information.

For these reports, the departments are divided into groups according to the highest degree offered in the mathematical sciences. The doctorate-granting departments are in six groups as described in the box.

Groups I and II include the leading departments of mathematics in the U.S. according to the 1982 assessment of Research-Doctorate Programs conducted by the Conference Board of Associated Research Councils in which departments were rated according to the quality of their graduate faculty.[1]

Group I is composed of 39 departments with scores in the 3.0–5.0 range.

Group II is composed of 43 departments with scores in the 2.0–2.9 range.

Group III contains the remaining U.S. departments reporting a doctoral program.

Group IV contains U.S. departments (or programs) of statistics, biostatistics and biometrics reporting a doctoral program.

Group V contains U.S. departments (or programs) in applied mathematics/applied science, operations research and management science which report a doctoral program.

Group VI contains doctorate-granting departments (or programs) in the mathematical sciences in Canadian universities.

Group M contains U.S. departments granting a master's degree as the highest graduate degree.

Group B contains U.S. departments granting a baccalaureate degree only.

[1]These findings were published in *An Assessment of Research-Doctorate Programs in the United States: Mathematical and Physical Sciences*, edited by Lyle V. Jones, Gardner Lindzey, and Porter E. Coggeshall, National Academy Press, Washington, D.C., 1982. The information on mathematics, statistics and computer science was presented in digest form in the April 1983 issue of the *Notices*, pages 257–267, and an analysis of the above classifications was given in the June 1983 *Notices*, pages 392–393.

TABLE 1: TOTAL FACULTY REPORTED FOR FOUR-YEAR COLLEGES AND UNIVERSITIES

	1984–1985				1985–1986			
	FACULTY		WOMEN		FACULTY		WOMEN	
	Total	With Tenure	Total	With Tenure	Total	With Tenure	Total	With Tenure
WITHOUT DOCTORATE								
Instructor/Lecturer	820	44	470	21	781	38	438	19
Assistant Professor	501	257	151	59	501	241	157	58
Associate Professor	375	351	62	53	365	338	57	47
Professor	107	100	15	12	104	97	14	12
	1803	752	698	145	1751	714	666	136
WITH DOCTORATE								
Instructor/Lecturer	203	22	36	5	222	21	45	5
Assistant Professor	1865	177	286	34	1913	177	298	32
Associate Professor	2336	2034	214	181	2361	2052	215	181
Professor	3803	3742	173	166	3902	3828	183	171
	8207	5975	709	386	8398	6078	741	389

TABLE 2: Percent of Doctorate Faculty with Tenure

	Fall 1984	Fall 1985
Groups I, II, III	76.2%	75.7%
Groups IV, V	73.7%	73.0%
Group VI	89.4%	89.6%
Masters and Bachelors	67.1%	66.7%

TABLE 3: Response Rates

U.S. Departments

Group	I	II	III	IV	V	M	B
% Response	77	79	65	68	54	44	35

Canadian Departments

Group	VI
% Response	46

Response Rates. Response rates among the various classes of departments vary widely, thus making it difficult to draw firm conclusions about the sizes of the faculty groups studied. Because the questionnaires request data for two years in a row, however, it is possible to estimate relative changes from one year to the next with somewhat more confidence. This year's response rates are given in Table 3. As in past years, the greatest rates of response are in Groups I, II, and III, which have a combined response rate of 71%.

Faculty Salaries

SIZE OF FACULTY

	1984-1985 FACULTY Total	1984-1985 FACULTY With Tenure	1984-1985 WOMEN Total	1984-1985 WOMEN With Tenure	1985-1986 FACULTY Total	1985-1986 FACULTY With Tenure	1985-1986 WOMEN Total	1985-1986 WOMEN With Tenure	1984-1985 Minimum	1984-1985 Median	1984-1985 Maximum	1985-1986 Minimum	1985-1986 Median	1985-1986 Maximum
DOCTORATE GRANTING DEPARTMENTS. Group I					(29 of 39 reporting)									
WITHOUT DOCTORATE														
Instructor/Lecturer	7	2	4	2	8	1	5	1						
Assistant Professor	1	1	1	1	1	1	1	1						
Associate Professor	3	3	0	0	2	2	0	0						
Professor	2	2	1	1	2	2	1	1						
	13	8	6	4	13	6	7	3						
WITH DOCTORATE														
Instructor/Lecturer	78	3	8	0	97	2	12	0	113	(210–250)	(210–250) 305	217	(230–255)	(232–265) 270
Assistant Professor	204	4	17	1	201	3	17	1	216	(220–259)	(245–275) 330	222	(250–273)	(260–294) (280–330) 366
Associate Professor	216	197	15	14	208	195	14	13	237	(259–322)	(308–345) (336–380) 450	249	(268–345)	(318–375) (352–434) 503
Professor	827	826	22	22	829	829	20	20	240	(318–385)	(434–487) (601–726) 770	262	(334–407)	(448–528) (638–800) 820
	1325	1030	62	37	1335	1029	63	34						
DOCTORATE GRANTING DEPARTMENTS. Group II					(34 of 43 reporting)									
WITHOUT DOCTORATE														
Instructor/Lecturer	90	6	54	2	71	6	46	2	143	(165–197)	(166–212) (179–242) 268	170	(176–221)	(180–231) (200–252) 281
Assistant Professor	2	2	0	0	2	2	0	0	—		— — —	—		— — —
Associate Professor	11	10	3	2	9	8	2	1	—		— — —	—		— — —
Professor	4	4	0	0	4	4	0	0	—		— — —	—		— — —
	107	22	57	4	86	20	48	3						
WITH DOCTORATE														
Instructor/Lecturer	38	2	6	0	37	2	7	0	95	(150–225)	(180–225) (200–225) 320	160	(170–225)	(196–250) (200–260) 339
Assistant Professor	251	14	33	3	256	13	31	2	186	(215–242)	(240–285) (260–307) 396	186	(230–258)	(253–291) (280–335) 397
Associate Professor	358	337	21	20	367	339	21	20	223	(256–300)	(295–343) (340–380) 528	223	(272–312)	(301–362) (360–410) 528
Professor	625	619	19	19	632	627	21	21	262	(310–360)	(396–460) (550–675) 776	262	(323–386)	(409–478) (555–687) 797
	1272	972	79	42	1292	981	80	43						
DOCTORATE GRANTING DEPARTMENTS. Group III					(46 of 71 reporting)									
WITHOUT DOCTORATE														
Instructor/Lecturer	93	3	63	3	81	3	50	3	111	(144–214)	(152–224) (160–240) 310	115	(160–210)	(160–210) (160–217) 322
Assistant Professor	32	27	13	9	30	26	11	6	172	(212–248)	(217–254) (225–260) 274	192	(220–259)	(229–269) (245–276) 286
Associate Professor	18	18	1	1	15	15	1	1	254	(254–377)	(275–377) (275–377) 388	254	(280–395)	(314–395) (330–395) 406
Professor	7	6	1	1	7	7	1	1	—		— — —	—		— — —
	150	54	78	14	133	51	63	11						

WITH DOCTORATE														
Instructor/Lecturer	17	1	3	0	14	1	3	0	168 (173–220)	(173–225)	(180–230) 275	180 (183–229)	(185–229)	(190–232) 285
Assistant Professor	291	32	36	7	292	30	39	5	184 (216–245)	(237–265)	(250–293) 354	200 (232–264)	(251–280)	(269–320) 371
Associate Professor	360	337	20	19	358	333	18	18	182 (248–285)	(286–320)	(320–379) 481	185 (254–290)	(301–336)	(331–401) 521
Professor	513	505	11	9	519	512	12	9	243 (304–343)	(360–428)	(431–563) 757	249 (320–382)	(393–454)	(462–616) 850
	1181	875	70	35	1183	876	72	32						

DOCTORATE GRANTING DEPARTMENTS. Group IV (45 of 66 reporting)

WITHOUT DOCTORATE														
Instructor/Lecturer	10	1	4	0	9	1	5	0						
Assistant Professor	7	2	2	0	3	2	0	0						
Associate Professor	0	0	0	0	0	0	0	0						
Professor	3	3	0	0	3	3	0	0						
	20	6	6	0	15	6	5	0						
WITH DOCTORATE														
Instructor/Lecturer	7	1	3	2	8	1	5	2	—	—	—	—	—	—
Assistant Professor	126	3	18	0	136	5	19	0	205 (232–278)	(242–285)	(254–310) 424	205 (246–280)	(270–303)	(279–340) 458
Associate Professor	110	95	13	12	121	107	15	13	233 (276–334)	(293–349)	(299–377) 513	237 (283–346)	(312–380)	(323–397) 540
Professor	285	283	13	11	296	290	9	9	290 (316–435)	(397–515)	(511–640) 830	301 (355–444)	(419–580)	(506–700) 892
	528	382	47	25	561	403	48	24						

DOCTORATE GRANTING DEPARTMENTS. Group V (15 of 28 reporting)

WITHOUT DOCTORATE														
Associate Professor	2	2	0	0	2	2	0	0						
	2	2	0	0	2	2	0	0						
WITH DOCTORATE														
Instructor/Lecturer	2	0	1	0	2	0	1	0	—	—	—	—	—	—
Assistant Professor	36	0	2	0	37	0	3	0	230 (248–298)	(262–324)	(281–340) 383	260 (263–350)	(290–350)	(305–361) 422
Associate Professor	42	38	3	2	40	34	3	2	290 (331–357)	(350–402)	(350–428) 435	296 (342–380)	(372–425)	(372–450) 478
Professor	107	107	3	3	112	112	3	3	217 (393–480)	(447–525)	(553–664) 690	230 (440–500)	(500–555)	(600–690) 740
	187	145	9	5	191	146	10	5						

DOCTORATE GRANTING DEPARTMENTS. Group VI (13 of 28 reporting)
(Canadian Departments)

WITHOUT DOCTORATE														
Instructor/Lecturer	2	1	1	1	2	1	1	1						
Assistant Professor	7	2	0	0	7	2	0	0						
Associate Professor	3	3	0	0	3	3	0	0						
Professor	7	7	0	0	7	7	0	0						
	19	13	1	1	19	13	1	1						
WITH DOCTORATE														
Instructor/Lecturer	0	0	0	0	0	0	0	0	—	—	—	—	—	—
Assistant Professor	47	12	4	1	45	12	4	2	230 (236–300)	(261–329)	(290–370) 408	220 (230–300)	(265–324)	(290–380) 408
Associate Professor	125	123	5	4	131	127	7	5	288 (303–383)	(359–437)	(392–481) 486	290 (303–390)	(367–437)	(399–487) 494
Professor	179	179	3	3	182	182	4	4	350 (353–463)	(428–544)	(480–686) 700	337 (350–470)	(446–562)	(480–686) 700
	351	314	12	8	358	321	15	11						

	SIZE OF FACULTY								SALARIES (in hundreds of dollars)					
	1984-1985				1985-1986				1984-1985			1985-1986		
	FACULTY		WOMEN		FACULTY		WOMEN							
	Total	With Tenure	Total	With Tenure	Total	With Tenure	Total	With Tenure	Minimum	Median	Maximum	Minimum	Median	Maximum
MASTER DEGREE GRANTING DEPARTMENTS					(125 of 282 reporting)									
WITHOUT DOCTORATE														
Instructor/Lecturer	298	18	179	9	300	15	185	9	120 (150–189)	(169–198)	(178–220) 304	123 (161–202)	(172–209)	(190–240) 350
Assistant Professor	172	116	48	29	167	108	51	29	164 (218–273)	(227–290)	(242–302) 361	170 (230–284)	(243–290)	(256–314) 391
Associate Professor	144	142	25	24	143	138	23	20	193 (253–311)	(257–323)	(263–330) 480	205 (267–333)	(271–334)	(280–353) 480
Professor	41	40	5	5	44	41	5	5	193 (320–404)	(323–404)	(323–421) 570	219 (316–405)	(316–405)	(340–464) 608
	655	316	257	67	654	302	264	63						
WITH DOCTORATE														
Instructor/Lecturer	43	10	9	3	42	10	11	3	172 (180–283)	(180–283)	(180–302) 304	172 (180–314)	(181–314)	(181–314) 335
Assistant Professor	459	64	79	12	487	66	82	13	183 (215–249)	(230–264)	(244–290) 419	195 (231–259)	(243–279)	(251–310) 380
Associate Professor	624	526	76	69	644	542	73	66	197 (253–291)	(278–330)	(305–361) 441	203 (264–304)	(291–340)	(312–393) 469
Professor	768	751	51	51	801	779	56	55	253 (300–360)	(334–404)	(377–453) 601	280 (313–380)	(358–426)	(401–487) 652
	1894	1351	215	135	1974	1397	222	137						
BACHELOR DEGREE GRANTING DEPARTMENTS					(332 of 943 reporting)									
WITHOUT DOCTORATE														
Instructor/Lecturer	320	13	165	4	310	11	146	3	102 (163–193)	(170–200)	(171–213) 313	130 (173–209)	(179–214)	(180–222) 336
Assistant Professor	280	107	87	20	291	100	94	22	80 (195–240)	(203–253)	(210–260) 360	121 (208–254)	(214–265)	(222–273) 374
Associate Professor	194	173	33	26	191	170	31	25	126 (231–301)	(234–309)	(241–314) 466	132 (240–314)	(242–320)	(248–322) 513
Professor	43	38	8	5	37	33	7	5	150 (263–347)	(263–355)	(263–360) 648	226 (293–371)	(293–388)	(293–388) 685
	837	331	293	55	829	314	278	55						
WITH DOCTORATE														
Instructor/Lecturer	18	5	6	0	22	5	6	0	195 (200–240)	(200–249)	(200–258) 313	206 (210–260)	(210–260)	(210–269) 336
Assistant Professor	451	48	97	10	459	48	103	9	160 (203–230)	(210–250)	(212–265) 400	177 (220–250)	(230–265)	(231–280) 430
Associate Professor	501	381	61	41	492	375	64	44	180 (239–286)	(250–308)	(260–325) 429	160 (254–309)	(263–325)	(270–341) 451
Professor	499	472	51	48	531	497	58	50	188 (269–354)	(281–373)	(291–398) 600	195 (283–369)	(299–394)	(309–427) 601
	1469	906	215	99	1504	925	231	103						

Salary Survey for New Recipients of Doctorates

The figures for 1985 in this article were compiled from questionnaires sent to individuals who received a doctorate in the mathematical sciences during the 1984-1985 academic year from universities in the United States and Canada.

Questionnaires requesting information on salaries and professional experience were distributed to 622 recipients of degrees using addresses provided by the departments which granted the degrees. Of these, 3 were returned by the postal service as undeliverable and could not be forwarded. There were 269 individuals who returned forms between late June and early September. The tables below are based on the responses from 243 of these individuals (200 men and 43 women). Data from 26 responses were not used in the compilation of the tables below; forms with insufficient data, or from individuals who had indicated they had part-time employment, were not yet employed, or were not seeking employment were considered unusable.

Readers should be warned that the data in this report are obtained from a self-selected sample and inferences from them may not be representative of the population. More comprehensive information on the number, the sex—minority group status—citizenship, and the employment status of the recipients of new doctorates granted last year in the mathematical sciences in the U.S. and Canada may be found in the previous article of this report on the 1985 Survey.

Key to Tables. *Salaries* are listed in hundreds of dollars. *Years* listed refer to the academic year ending in the listed year. *M* and *F* are Male and Female respectively. *One year experience* means that the persons had experience limited to one year or less in the same position or a position similar to the one reported; some persons receiving a doctorate had been employed in their present position for several years. $(X+Y)$ means there are *X men and Y women* in the 1985 sample. Quartile figures are given only in cases where the number of responses is large enough to make them meaningful.

Graphs. For each category and year, the median starting salary is denoted by a horizontal bar; a vertical bar extends to the extremes. The salary information in the graphs is in hundreds of dollars.

The connected line segments equate value of the dollar from one year to the next, using 1965 median starting salary as a benchmark and adjusting that to current dollars by the implicit price deflators prepared annually by the Bureau of Economic Analysis, U.S. Department of Commerce. Because the deflator is not yet available for this year, the 1985 figures do not appear on the graphs. If the rate of change in the actual starting salaries is less than the slope of the corresponding line segment, median starting salaries did not keep up with inflation.

Note that starting salaries for all categories fall behind the cost of living change in 1975 as compared to 1970. Some of this loss was made up between 1980 and 1982. Between 1982 and 1983, academic salaries just kept up with inflation, research and industry salaries showed real increases, and government salaries showed no increase and thus a drop when adjusted for inflation. Between 1983 and 1984, nine-month academic salaries showed a slight gain on inflation, twelve-month academic, twelve-month research, and industry salaries generally held constant and, thus, effectively dropped when adjusted for inflation, but government salaries actually decreased. Generally, the range of salaries is increasing with time.

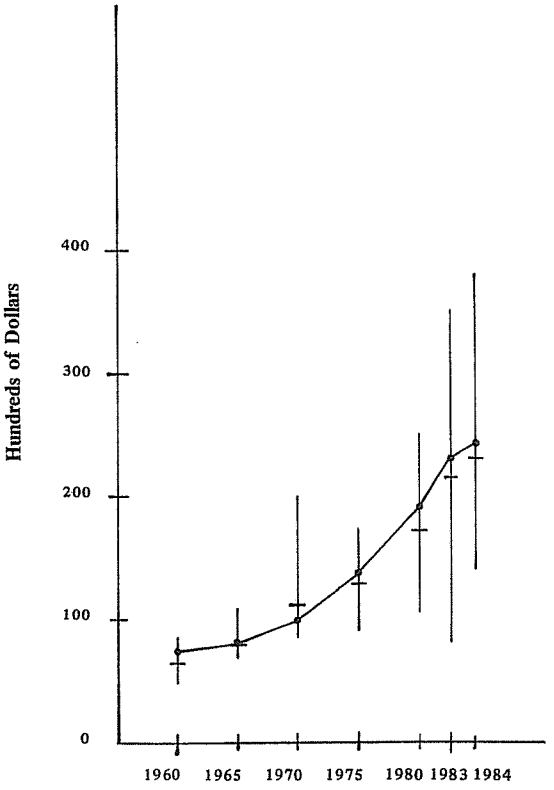
Nine-Month Salaries

Year	Min	Q_1	Median	Q_3	Max	1965 Salary Median in Current $
TEACHING OR TEACHING AND RESEARCH (118 + 28)						
1960	49		65		80	74
1965	70		80		105	80
1970	85		110		195	98
1975	90	120	128	135	173	135
1980	105	155	171	185	250	192
1981	130	175	190	210	320	210
1982	160	190	206	229	370	223
1983	80	200	217	240	350	232
1984	140	215	230	255	380	241
1985	170	230	250	270	380	–
1982M	160	192	210	229	370	
1982F	160	175	198	225	285	
1983M	95	204	220	240	350	
1983F	80	198	210	227	330	
1984M	140	215	232	255	380	
1984F	161	215	228	251	325	
1985M	186	232	250	270	380	
1985F	170	215	242	270	366	
One Year Experience (102 + 24)						
1985M	186	230	250	265	380	
1985F	170	270	239	263	366	

Nine-Month Salaries

Year	Min	Median	Max	1965 Salary Median in Current $
RESEARCH (5 + 0)				
1960	52	65	80	75
1965	71	81	90	81
1970	78	105	160	100
1975	100	–	110	137
1980	125	137	180	195
1981	143	–	145	213
1982	180	190	235	226
1983	100	200	230	235
1984	205	205	205	244
1985	205	235	250	–
1982M	180	190	190	
1982F	–	235	–	
1983M	100	200	230	
1983F	205	205	205	
1984M	205	205	205	
1984F	–	–	–	
1985M	205	226	250	
1985F	–	–	–	
One Year Experience (4 + 0)				
1985M	205	226	250	
1985F	–	–	–	

Nine-Month Teaching



Graph omitted because sample size too small

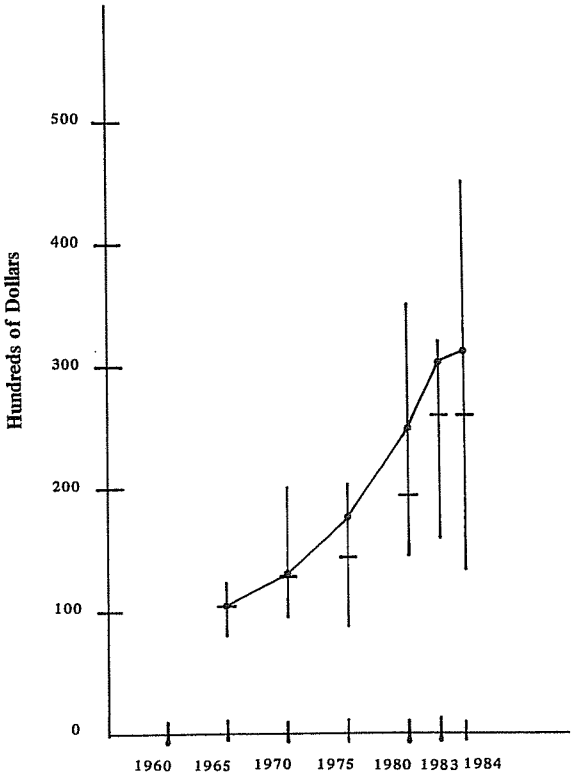
Twelve-Month Salaries

Year	Min	Median	Max	1965 Salary Median in Current $
TEACHING OR TEACHING AND RESEARCH (11 + 7)				
1960	.....NO DATA			
1965	78	104	121	104
1970	95	128	200	128
1975	87	145	204	176
1980	143	195	350	250
1981	156	203	400	274
1982	100	250	500	290
1983	160	260	320	301
1984	134	260	450	313
1985	220	273	470	-
1982M	180	250	500	
1982F	100	266	367	
1983M	160	255	320	
1983F	240	265	270	
1984M	134	260	450	
1984F	240	275	330	
1985M	230	240	470	
1985F	220	280	420	
One Year Experience (8 + 6)				
1985M	230	260	470	
1985F	220	273	420	

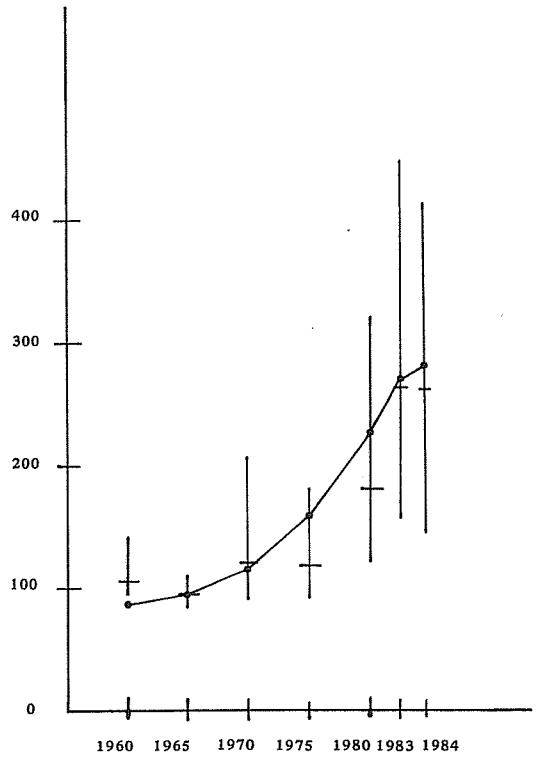
Twelve-Month Salaries

Year	Min	Median	Max	1965 Salary Median in Current $
RESEARCH (19 + 3)				
1960	97	105	140	86
1965	81	93	107	93
1970	90	120	205	114
1975	90	119	180	157
1980	120	180	321	224
1981	140	200	280	245
1982	130	245	364	259
1983	155	262	450	269
1984	145	261	415	280
1985	190	342	520	-
1982M	144	230	336	
1982F	130	265	364	
1983M	195	262	450	
1983F	155	260	364	
1984M	170	283	415	
1984F	145	200	253	
1985M	190	360	520	
1985F	279	300	323	
One Year Experience (13 + 2)				
1985M	190	315	432	
1985F	279	290	300	

Twelve-Month Teaching



Twelve-Month Research



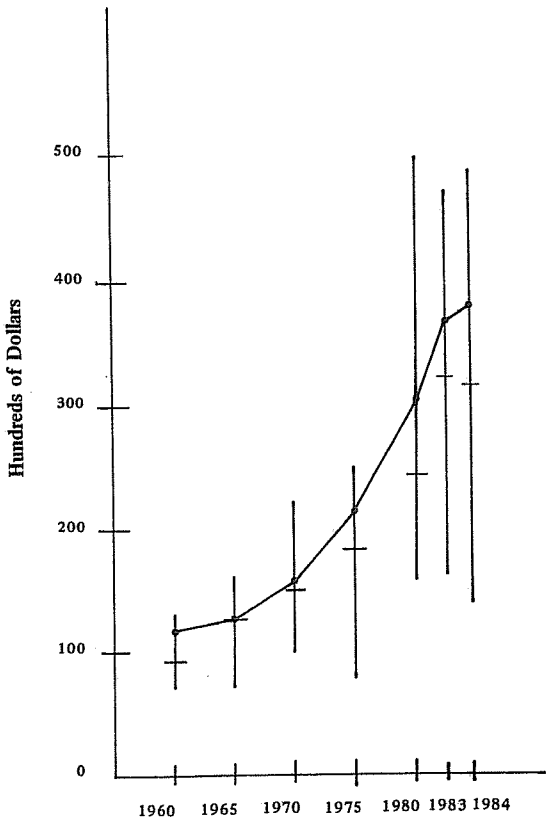
Twelve-Month Salaries

Year	Min	Median	Max	1965 Salary Median in Current $
		GOVERNMENT (11 + 0)		
1960	72	93	130	117
1965	70	126	160	126
1970	100	150	223	155
1975	78	182	247	213
1980	156	244	501	303
1981	220	290	460	332
1982	228	325	470	351
1983	160	322	422	365
1984	140	315	490	379
1985	263	325	440	–
1982M	228	331	470	
1982F	282	326	369	
1983M	160	313	422	
1983F	293	320	350	
1984M	288	326	490	
1984F	140	202	263	
1985M	263	325	440	
1985F	–	–	–	
One Year Experience (8 + 0)				
1985M	263	323	411	
1985F	–	–	–	

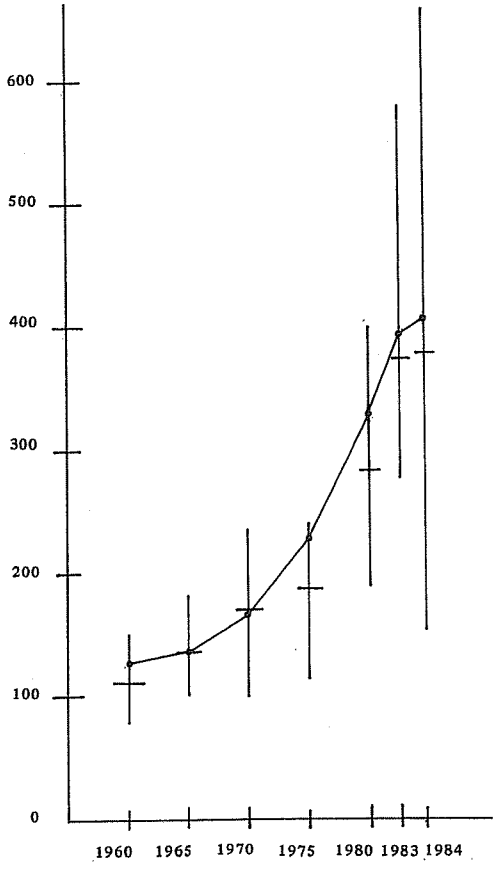
Twelve-Month Salaries

Year	Min	Median	Max	1965 Salary Median in Current $
		BUSINESS AND INDUSTRY (36 + 5)		
1960	78	110	150	126
1965	100	136	180	136
1970	96	170	235	167
1975	114	187	240	230
1980	190	284	400	327
1981	195	308	500	358
1982	196	354	550	379
1983	276	375	580	394
1984	180	378	660	409
1985	260	400	493	–
1982M	196	366	550	
1982F	230	350	430	
1983M	300	370	580	
1983F	276	375	413	
1984M	180	383	660	
1984F	200	342	416	
1985M	260	400	493	
1985F	295	370	430	
One Year Experience (27 + 2)				
1985M	260	396	493	
1985F	370	400	430	

Twelve-Month Government



Twelve-Month Business and Industry



Notices, Volume 32, Number 6, November 1985

Report on the 1985 Survey of New Doctorates

by Edward A. Connors

This report presents a statistical profile of new doctorates in mathematical sciences awarded by universities in the United States and Canada during the period July 1, 1984, through June 30, 1985. It includes the employment status of recipients of 1984-1985 doctorates in mathematical sciences (as of August 20, 1985) and an analysis of the data by sex, minority group, and citizenship. In addition, trends in the number of doctoral degrees are reported for each of the Groups I through V (see the first page of this Report of the 1985 Annual AMS Survey for a description of the classification system and the *Notices*, June 1983, for a listing of the departments in Groups I and II. Table 0 provides information on the response rates for this part of the Survey.

TABLE 0: Response Rates

Group I	38 of 39 including 1 with 0 degrees
Group II	39 of 43 including 8 with 0 degrees
Group III	59 of 71 including 20 with 0 degrees
Group IV	54 of 66 including 5 with 0 degrees
Group V	28 of 54 including 7 with 0 degrees

We continue the practice adopted in the 1983 Report and do not report doctorates granted by computer science departments (formerly included with the totals for Group V departments). The reporting rate of computer science doctorates was considered too small to merit inclusion. In the 1982 Survey, for example, 105 doctorates in computer science were reported whereas the actual number of degrees granted was, in all likelihood, more than twice that number. In contrast, virtually all of the mathematical sciences doctorates are reported. Thus, any year to year comparisons that bridge the 1982 and 1983 Surveys should accommodate this modification.

TABLE 1A: New Doctorates, Fall Counts

80-81	81-82	82-83	83-84	84-85
812	755	792	789	769

TABLE 1B: New Doctorates, Fall and Spring Counts

	79-80	80-81	81-82	82-83	83-84	84-85
Fall	858*	904*	860*	792	789	769
Spring	898*	927*	914*	840	827	**

*Includes computer science.

**To appear in the *Notices*, March 1986.

The number of new doctorates reported for 1984-1985 was 769 (fall 1985 count) compared to 789 for 1983-1984 (fall 1984 count). The comparable figure for 1982-1983 was 792, and the figures for 1981-1982 and 1980-1981 are 755 and 812, respectively (the latter two figures *do not* include doctorates awarded by computer science departments). These numbers are obtained from the Annual Survey Reports in the November *Notices* and are tabulated in Table 1A. Table 1A does not include degrees from computer science departments.

As is customary, a second, updated report is planned for the March 1986 issue of the *Notices*. Table 1B contrasts the number of new doctorates reported in the November Reports with the more complete totals reported in the following spring Reports for the years 1979-1980 to 1983-1984. The last column is the number reported in this Survey. Note that the table entries prior to 1982-1983 include the computer science departments and, thus, this table is an extension of the comparable one from last year's Report (*Notices*, November 1984, page 754).

The data for 1984-1985 indicate a decline of 3% in doctorates awarded from the corresponding figures for 1983-1984, and a decline of 5% from the 1980-1981 figures. Of the 732 doctorates reported from US universities (there were 37 doctorates from Canadian universities) the citizenship is reported as known for 726 recipients, with US citizens accounting for 55% (396) of this total. The 1983-1984 figures were 59% (433) and the 1982-1983 figures were 61% (455). The percentage of doctorates who are US citizens has declined consistently and dramatically from 73% in 1979-1980 to 55% in 1984-1985. Thus, in 1984-1985, US institutions produced only approximately 400 doctorates in the mathematical sciences who are US citizens.

Females comprise 20% of the US citizens receiving doctorates from US institutions in 1984-1985. This percentage is the same as for the last two years. Table 6 gives these figures for the period 1972-1973 to 1984-1985. Since 1972-1973, the percentage of female US citizens receiving doctorates in mathematical sciences from US universities has doubled.

The employment matrix, Table 2, is similar to last year's, with three exceptions: 51 new doctorates were employed by Group III departments compared to 35 last year, 66 new doctorates were hired by Group M departments compared to 88 last year, 140 new doctorates were reported to have taken employment outside of the US and Canada, compared with 113 last year. The number of those reported as still seeking employment is 27 (compared with 39 last year) and 45 were classified as having unknown employment status (compared with 48 last year).

Employment Status of New Doctorates, 1984-1985. Table 2 shows the employment status, by

TABLE 2: Employment Status of 1984-1985 New Doctorates in the Mathematical Sciences

Type of Employer	PURE MATHEMATICS: Algebra and Number Theory	Analysis and Functional Analysis	Geometry and Topology	Logic	Probability	Statistics	Computer Science	Operations Research	Applied Mathematics	Mathematics Education	Other	Total
Group I	22	16	19	4	3				8		8	80
Group II	3	8	8	1	3	4			7		2	36
Group III	7	8	7	1	6	6		1	12		3	51
Group IV					3	13					2	18
Group V						2		1	4			7
Masters	11	17	4	2	3	19		1	5	1	3	66
Bachelors	17	9	5	7	1	9	1	3	6	4	4	66
Two-year College		2	2		1						1	6
Other Academic Departments	4	1	4	1		22	3	12	7		3	57
Research Institutes	2	3	1	2	2	5		2	5		2	24
Government		3	1			4			5		1	14
Business and Industry	4	5	3	5	6	30	6	12	14		19	104
Canada, Academic	3	5			2	8			2		1	21
Canada, Nonacademic	1				1	4					1	7
Foreign, Academic	6	9	10	4	2	28	3	3	20	1	9	95
Foreign, Nonacademic	2	4			1	24		3	7		4	45
Not seeking employ.												
Not yet employed	5	4	1		1	3	2	2	5	1	3	27
Unknown	7	11	5		4	8		1	8		1	45
Total	94	105	70	27	39	189	15	41	115	7	67	769

TABLE 3: Sex, Minority Group, and Citizenship of New Doctorates

July 1, 1984--June 30, 1985

U.S. DEGREES	MEN					WOMEN					TOTAL
	CITIZENSHIP					CITIZENSHIP					
RACIAL/ETHNIC GROUP	U.S.	Canada	Other	Not Known	Total Men	U.S.	Canada	Other	Not Known	Total Women	
Asian, Pacific Islander	18	1	117	4	140	6		13		19	159
Black	4		11		15	1				1	16
American Indian, Eskimo, Aleut	3				3						3
Mexican American, Chicano, Puerto Rican			7		7	1		3		4	11
None of those above	275	10	137	2	424	72	1	23		96	520
Unknown	15	2	4		21	1		1		2	23
Total Number	315	13	276	6	610	81	1	40		122	732

CANADIAN DEGREES	MEN					WOMEN					TOTAL
	CITIZENSHIP					CITIZENSHIP					
RACIAL/ETHNIC GROUP	U.S.	Canada	Other	Not Known	Total Men	U.S.	Canada	Other	Not Known	Total Women	
Asian, Pacific Islander			1		1						1
Black			2		2						2
American Indian, Eskimo, Aleut											
Mexican American, Chicano, Puerto Rican			1		1						1
None of those above	2	13	6		21			11	1	12	33
Unknown											
Total Number	2	13	10		25			11	1	12	37

type of employer and field of degree, of the 769 recipients of doctoral degrees conferred by the mathematical sciences departments in the US and Canada between July 1, 1984 and June 30, 1985. The names of these 769 individuals are listed with their thesis titles in a later section of this Report.

In rows 1 through 5, the numbers represent those who have accepted appointments in US doctorate-granting mathematical sciences departments (Groups I–V). In the next two rows, the figures represent those accepting appointments in US mathematical sciences departments granting masters and bachelors as the highest degree. The information was obtained from the departments granting the degrees and from the recipients themselves.

Among the 1984-1985 new doctorates employed in the US (529), 61% (324) took positions in university or four-year college mathematical sciences departments; 22% (118) took positions in government, business or industry; while the remaining 17% (87) are employed by research institutes, other academic departments or two-year colleges. These percentages are the same as the corresponding ones reported last November.

Table 2 shows as "not yet employed" about 4% of the 1984-1985 new doctorates, excluding those whose employment status is unknown. The data in Table 2 were obtained in many instances early in the summer of 1985 and do not reflect subsequent hiring; an update of Table 2 is planned for the March 1986 *Notices*. A similar update last year revealed that all but 16 new 1983-1984 doctorates found positions by fall 1984 (see the *Notices*, November 1984, page 755, and March 1985, page 179). Eleven persons included in Table 2 reported taking part-time employment.

Table 2 shows that recipients in the two employment categories *foreign academic* and *foreign nonacademic* comprise a total of 140 or 18% of the 769 new doctorates—corresponding numbers for last year were 113 and 14%, respectively.

Sex, Minority Group and Citizenship of New Doctorates, 1984-1985. Table 3 presents a breakdown according to sex, minority group and citizenship of these 769 new doctorates. The information reported in this table was obtained from departments granting the degrees and in some cases from the recipients themselves.

Analyses of the 1984-1985 employment forms of the new doctorates indicate that of the 167 new doctorates employed by Group I, II, or III departments, 13% are women, an increase of 3% over the 10% reported in each of the three previous years.

Of the 132 new doctorates employed by bachelors and masters granting departments, 26% are women, and of the 118 new doctorates employed by government, business or industry, 15% are women. The corresponding figures for last year in these two latter groups were 24% and 13%, respectively.

Trends in the Number of New Doctorates. Table 4 gives the number of doctorates granted during 1982-1983, 1983-1984, and 1984-1985 by those departments in Groups I–VI *which reported in all three years* (as of August 20, 1985). This is the same criterion used in last year's Report. The number of such departments out of the total is given in parentheses. (Computer science departments are not included.) The entries for the 1982-1983 and 1983-1984 columns should *not* be expected to agree with the corresponding columns in last year's Report, due to the criterion for inclusion. For example, a department that did not respond to this year's Survey is not included this year although it may have been included in the tally for last year. [Moreover, last year there was a numerical error in the entry for Group I: the 283 in the column labeled 82-83 should have been 252 (see the *Notices* for November 1984, page 756, Table 4).]

TABLE 4: Number of New Mathematics and Statistics Doctorates Reported by Selected Departments

	82-83	83-84	84-85
Group I (38 out of 39 depts.)	276	245	302
Group II (36 out of 43 depts.)	107	110	69
Group III (47 out of 71 depts.)	77	76	59
Subtotal	460	431	430
Group IV (44 out of 66 depts.)	151	136	150
Group V (21 out of 54 depts.)	92	97	83
Group VI (20 out of 28 programs)	38	36	43
Subtotal	281	269	276
TOTAL	741	700	706

Citizenship and Sex of U.S. Doctorates, 1972–1985. Again this year, information is presented on the annual number of doctorates granted by US universities to US citizens (Table 5). This number is divided into male and female doctorates (Table 6). These data are presented for the period 1972–1985 using the Annual AMS Survey Reports on new doctorates published each year in the October or November *Notices*. Thus Tables 4 and 5 are extensions of tables in last year's Report. In Table 5 the first column (headed Adjusted Total of Doctorates given by US Universities) gives the number of doctorates granted between July 1 and June 30 of the indicated years *whose citizenship is known*. Column 2 gives the number who were US citizens and Column 3 the percentage that this represents. In Table 6 the number in Column 2 of Table 5 is further divided into men and women. Note that in both tables *all years but* 1982-1983, 1983-1984, and 1984-1985 include doctorates granted by computer science departments.

TABLE 5: U.S. Citizen Doctorates

	Adjusted Total of Doctorates given by U.S. universities	Total of Doctorates who are U.S. citizens	%
1972-1973	986	774	78%
1973-1974	938	677	72%
1974-1975	999	741	74%
1975-1976	965	722	75%
1976-1977	901	689	76%
1977-1978	868	634	73%
1978-1979	806	596	74%
1979-1980	791	578	73%
1980-1981	839	567	68%
1981-1982	798	519	65%
1982-1983	744	455	61%
1983-1984	738	433	59%
1984-1985	726	396	55%

TABLE 6: U.S. Citizen Doctorates, Male and Female

	Doctorates who are U.S. Citizens	Male	Female	% Female
1972-1973	774	696	78	10%
1973-1974	677	618	59	9%
1974-1975	741	658	83	11%
1975-1976	722	636	86	12%
1976-1977	689	602	87	13%
1977-1978	634	545	89	14%
1978-1979	596	503	93	16%
1979-1980	578	491	87	15%
1980-1981	567	465	102	18%
1981-1982	519	431	88	17%
1982-1983	455	366	89	20%
1983-1984	433	346	87	20%
1984-1985	396	315	81	20%

It is quite clear that there has been a consistent and dramatic decline in the number of new doctorates in the mathematical sciences awarded to US citizens by US institutions. If this pattern continues, the impact on US educational institutions will be significant. Particularly vulnerable are the masters and bachelors degree-granting institutions which, in addition to their other essential and valuable contributions to the American educational system and society, are a great source of potential scientific scholars and technical experts. A shortage of well-trained personnel for masters and bachelors degree-granting institutions will further serve to exacerbate current difficulties caused by inadequate funding and support services (see, for example Bernard Madison's article *Institutional Support for Mathematical Science Departments* in the *Notices*, October 1985, pages 584 to 588).

A Fifteen Year Retrospective on Academic Salaries of U.S. Doctorate Holding Faculty

by Donald C. Rung

Since 1957 the Society has published a survey of annual salaries of mathematical sciences faculty so the mathematical community may assess general salary levels. It is apparent to even the casual reader of these surveys that since 1970 salaries (after adjusting for inflation) have declined. In an attempt to assess how dramatic this decline is, the author published two previous articles appearing in the October 1979 *Notices* and November 1981 *Notices* comparing salary levels after adjusting for inflation. The present article updates these articles and extends the analysis to all of the groups (Group I, II, III, IV, M, and B) used in reporting salaries.

The figures show that over the last several years salaries have kept pace with inflation but have not recovered from the dismal decline experienced in the period 1970–1980. *Thus salary levels today are still significantly lower than in 1970.* This is especially true for salaries in Group B, the bachelor granting departments. If a person began as an assistant professor in 1970, earning the 1970 average salary reported for this rank (in 1985 dollars) of $28,100 and is now a full professor earning the 1985 reported average salary of $34,700, the real increase in salary has been 24%! The corresponding number for Group I faculty is 66%. In 1985 for Group I, the average assistant professor salary is 57% of a full professor salary, while in Group B the corresponding number is 71%. Thus Group B salaries give a vivid example of the so called "compression" phenomenon. These various figures are reported in Table II.

We also include an analysis of salary for new recipients of the doctorate taking nine-month positions combining teaching and research (Table I). It is interesting to note that these numbers parallel closely the average salary of assistant professors in Group B departments.

For the years surveyed, salaries are given both in actual dollars and 1985 dollars. The actual dollar figures were converted to 1985 dollars using the implicit price deflator index prepared by the Bureau of Economic Analysis of the U.S. Department of Commerce and often used by educational planners. It is a somewhat more conservative index than, say, the Consumer Price Index. The 2nd quarter index for the years 1970, 1975, 1980, and 1985 was used. Using this index, the 1970 dollar is multiplied by 2.535, the 1975 dollar multiplied by 1.856, and the 1980 dollar by 1.308 (to equal the 1985 dollar). The index along with the multipliers is given in Table III. The index has been revised recently by the government and the most recent index is given in this article. It differs slightly from the index used in the previous articles.

A further word of explanation on the tables. The figures used to compute salaries in Table I for new recipients of the doctorate were obtained from the Society's Annual Survey reported in the October *Notices* of 1970 and 1975 and the November *Notices* of 1980 and 1985 respectively. A slightly different technique was used to arrive at the professorial salaries given in Table II. The salaries for each of the years given in Table II were computed using the salary for that year as reported in the succeeding year's Survey except for the current year. Thus, the 1970 numbers are from the Survey as reported in the October 1971 *Notices*, the 1975 figures are from the October 1976 *Notices*, the 1980 figures are from the November 1981 *Notices*, and the 1985 figures are from this issue of the *Notices*. To arrive at a representative salary for each rank, the median salaries for the 25th and 75th percentiles were averaged. The classification of departments of universities and colleges for Groups I, II and III changed in 1983. However, as was noted at the time of the change, the salaries in each of the new groupings changed little. (See the first page of this report of the 1985 Survey for definitions of the groups.)

To attract the talented young student to an academic career in mathematics is essential. Adequate salaries are an important incentive, especially with competing disciplines (and industry) offering competitive salaries. We have begun to reverse the inflationary decline but are a long way from the salary levels attained in 1970. The Group B salary scale especially needs to be monitored in hopes that some improvement in salary levels will occur. The vitality of our profession is essential for the vitality of science. It is hoped that the general improvement in salaries over the last few years will continue.

Professor Edward Connors of the University of Massachusetts, Amherst, is now the principal author of these surveys. I wish to thank the secretariat of the Society, especially Lincoln K. Durst, James W. Maxwell, Virginia M. Biber and Marcia C. Almeida for their kind and efficient help in preparing these articles. I hope that these articles have been, and will continue to be, of benefit to our profession.

TABLE I: Salary for New Recipients of the Doctorate

(Nine month teaching and research)

In 1985 dollars (current dollars in parentheses)

1970	1975	1980	1985
27,900 (11,000)	23,800 (12,800)	24,400 (17,100)	25,000

TABLE II: Faculty Salaries

In 1985 dollars (current dollars in parentheses)

	1970	1975	1980	1985
Group I				
Inst.	26,300 (10,400)	22,400 (12,600)	NA	24,400
Asst. Prof.	29,400 (11,600)	25,600 (13,800)	25,900 (19,800)	27,700
Assoc. Prof.	36,800 (14,500)	33,200 (17,900)	32,800 (25,100)	34,700
Full Prof.	57,000 (22,500)	52,300 (28,300)	49,500 (37,800)	48,800
Group II				
Inst.	NA	21,900 (11,800)	21,800 (16,700)	22,300
Asst. Prof.	30,900 (12,200)	27,100 (14,600)	25,400 (19,400)	27,200
Assoc. Prof.	38,300 (15,100)	33,600 (18,100)	32,100 (24,500)	33,200
Full Prof.	54,700 (21,600)	48,400 (26,100)	44,200 (33,800)	44,400
Group III				
Inst.	NA	18,900 (10,200)	19,600 (15,000)	20,700
Asst. Prof.	30,900 (12,200)	26,600 (14,300)	24,500 (18,700)	26,600
Assoc. Prof.	38,500 (15,200)	33,400 (18,000)	31,400 (24,000)	31,900
Full Prof.	51,500 (20,300)	44,000 (23,700)	41,900 (32,000)	42,400

*NA = not available.

	1970	1975	1980	1985
Group IV (Statistics)				
Inst.	NA	NA	NA	NA
Asst. Prof.	30,400 (12,000)	27,000 (14,600)	26,400 (20,200)	28,700
Assoc. Prof.	36,800 (14,500)	35,100 (18,900)	34,700 (26,500)	34,600
Full Prof.	49,400 (19,500)	50,700 (27,300)	48,100 (36,800)	50,000
Group M				
Inst.	NA	23,900 (12,900)	21,500 (16,400)	24,800
Asst. Prof.	29,900 (11,800)	26,500 (14,300)	25,100 (19,200)	26,100
Assoc. Prof.	35,500 (14,000)	32,700 (17,600)	30,600 (23,400)	31,600
Full Prof.	44,600 (17,600)	39,700 (21,400)	38,200 (29,200)	39,200
Group B				
Inst.	NA	NA	NA	23,500
Asst. Prof.	28,100 (11,100)	23,600 (12,700)	22,400 (17,100)	24,800
Assoc. Prof.	35,000 (13,800)	28,600 (15,400)	27,600 (21,100)	29,400
Full Prof.	40,800 (16,100)	35,800 (14,300)	33,600 (25,700)	34,700

TABLE III: Implicit Price Deflator

(2nd Quarter Index)

Proposed by Bureau of Economic Analysis

U.S. Department of Commerce

Year	Index Value	Multiplier*
1970	91.1	2.535
1975	124.4	1.856
1980	176.5	1.308
1985	230.9**	1

*To obtain 1985 dollars.

**Flash estimate.