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ABSTRACT

A study was designed to develop a method for identifying and ameliorating faculty salary differentials or inequities at a moderately large (500 faculty members) master's-degree-granting institution. A linear regression model was chosen to determine the relationship between the observed salary and the independent variables of rank, years experience, and degrees held. The model was used to compute an individual's predicted salary, and those earning less than predicted were identified as possible salary inequities. Several 2- and 3-way cross-tabulations were conducted to detect possible nonlinear effects. The increment for each rank was determined by calculating 10 percent of the mean salary for each rank and adjusting everyone's salary upward by that amount or until the salary ceiling of the rank was reached. Salaries were then adjusted for the 200 full-time faculty identified as underpaid. Although no discernable overall pattern of sex or race related salary inequities was noted, the model did identify disproportionately more individuals of certain ranks and/or departments as "inequities." Problems involved in such a study are (1) getting agreement as to what are appropriate variables to be considered in determining salary differentials, and (2) developing the mechanism for gathering data, quantifying it, and putting it into machine-compatible form (JT).

Salary Inequities and/or Differentials; Identification and Adjustment

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Objective

Recent events on the national scene indicate an increased concern with various aspects of economic discrimination in higher education. This report describes how a moderately large (approximately 500 faculty members) suburban-urban master's degree granting institution responded to external and internal concerns about salary differentials and/or inequities. The purpose of this study was to develop a method for identifying and ameliorating faculty salary differentials or inequities. The method was to be acceptable to the faculty as well as to the administration and still work within the constraints of a tight budget.

Perspective

Until passage of recent public policy measures, such as "Affirmative Action," "Equal Pay Act," and Title IX of the Higher Education Act of 1972, designed to eliminate salary inequities, little systematic exploration had been made of the various factors leading to salary differentials among faculty members. Several large scale studies (Johnson and Stafford, 1974, Gordon, et.al., 1974 or Katz, 1973) investigated large samples of faculty members to ascertain the magnitude as well as the possible causes of observed salary differentials. Although such studies discovered salary differentials that could be related to membership in various identifiable groups (i.e., sex, race, etc.), there was never complete agreement as to the cause or causes for observed salary differentials nor as to whether

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observed differentials are inequities. It is important to note that salary differentials based on bonafide seniority or merit are acceptable. (Obviously, this allows ample room for disagreement as to what constitutes legitimate seniority or merit differentials.)

The number of studies in this area is likely to increase. Recently, the American Association of University Professors (AAUP) was granted $50,000 to develop a "Higher Education Salary Evaluation Kit" to provide a method for detection of salary differentials and possible salary inequities. (Academe, 1975)

At the local level this report reports on an ongoing investigation conducted by the Faculty Association Salary and Fringe Benefits Committee: Sub-Committee on Salary Inequities. In some respects this investigation by a faculty committee was unusual in that the committee recommendations were to be implemented (if the Faculty Association agreed). The committee members included men and women from various departments and of various ranks. The committee was given information concerning the amount available for salary increments and data covering characteristics of the faculty. After the data was collected, it was coded and punched by the Institutional Research Office. Computer time for analysis was made available by the Computer Center. The committee was to review the adjustments awarded the previous year (when adjustments were made within ranks and by degree held) and prepare a new adjustment plan.

Methods

A variety of methods were proposed for determining salary inequities. They ranged from the plan that all holding the same rank would receive the same salary, to defining as inequities those whose salary was below the mean for that rank, to regression models either within ranks or within the total institution.

In the present study a linear regression model was chosen to determine the relationship between the observed salary and the independent variables. The independent variables were: date first employed at the institution, sex, race, academic

department, and total years of professional experience.

The original stepwise regression model used all of the independent variables. It was noted that three variables; rank, years experience, and degrees held provided a multiple r = .95. (This was fortunate as there was less controversy concerning the appropriateness of these variables for investigating salary differentials than the remaining variables.) The decision was then made to use these three variables as the basis for the determination of salary inequities.

This model was used to compute an individual's predicted salary. Individuals earning less than their predicted salary were identified as possible salary inequities. Although several studies of this nature seemed to have relied on the skills of competent computer programmers to develop specific programs, this study made use of a commonly available statistical package (SPSS, 1975) for data analysis and manipulation. Since the"true" relationship between salary and the independent variables may be complicated, several two and three way crosstabulations were conducted to detect possible non-linear effects.

Procedures

Upon recommendation of the committee the increment for each rank was determined by calculating ten percent of the mean salary for each rank and adjusting everyone's salary upward by that amount or until the salary ceiling of the rank was reached. (After the end of the academic year this amount was adjusted downward. This happened after faculty members had already received letters indicating the amount of their next years salary.) An additional amount, approximately $88,000 was to be available to adjust the identified inequities. These adjustments were to be made after the 1975-1976 promotions and increments had been made.

The following explanation was sent to the faculty by the Academic Dean.

> The new method mathematically determines the relationship (correlation) between the salary and the three factors of rank, total years of experience, and degree. It analyzes the entire salary structure for the whole faculty; it assumes that as faculty have been promoted, gained years of experience and earned higher degrees, they have earned more than those who have not. It does not make a value judgment about this structure but rather determines the influence that each of the factors has had in determining what a faculty member earns...Using this method, it is possible to project a faculty member's salary based on his/her rank, years of experience and degree. (Shaw, 1975)

Three constraints were placed upon the determination of salary adjustments. 1) a salary could not be adjusted above the ceiling for that rank; 2) all individuals at the two highest ranks were to be treated as holders of the Ph.D. as well as individuals in disciplines where the master's degree is considered the terminal degree, e.g. the Master's of Fine Arts; 3) only full time faculty members were included in the study. Only individuals who were identified as being underpaid were to have their salaries adjusted.

With the exception of the faculty self-report of prior professional experience, all information utilized was obtained from the Academic Dean's Office (Personnel Office). After the data was collected, it was coded and punched by the Academic Systems Research Office.

Results

Although no discernable overall pattern of sex or race related salary inequities was noted, this model did identify disproportionately more individuals of certain ranks and/or departments as inequities. Approximately 200 faculty members were notified that they would receive salary adjustments. (They were later notified that because of unanticipated budget cuts the adjustments would be made for the 1976-1977 academic year rather than the 1975-1976 academic year as earlier indicated.) The total monies indicated by the regression model as needed to complete adjustments was approximately $250,000. In as much as less than $90,000 was

available, adjustments were made at the rate of 34% of the indicated differential. The regression equation employed may be ascertained from the following table.

Table I

	Mult R	B
rank	.872	2293.93
years experience	.921	219.05
degree held	.923	481.37
constant		7582.44
standard error		1626.52

The interrelationships among the dependent and independent variables are presented in Table II.

Table II

Intercorrelation Matrix of Dependent and Independent Variables

	rank	years experience	degree held
salary	.82	.78	.50
rank		.57	.55
years experience			.18

The regression model employed did not utilize sex or ethnic group as independent variables. It was assumed that if such discrimination had been practiced, the number of and amounts of the adjustment to the various classifications of faculty members would reflect this discrimination. In order to investigate pattern of adjustments to various ethnic groups, the data in Table III was compiled. No further analysis was attempted due to the small numbers in the various ethnic classifications.

(See Table III)

Tables IV and V are concerned with the salary adjustments made to various groups of faculty members classified according to sex and rank or academic division. It is interesting to note that although the overall proportion of male and

female faculty members receiving adjustments was similar (46% vs. 52%) and the mean adjustment values was close ($432.25 vs. $435.44), there are wide discrepancies among the various categories.

(See Table IV)

(See Table V)

Doing A Study On Your Own Campus

The completion of a study such as this revolves around two basic problems: 1) Getting agreement as to what are the appropriate variables to be considered in determining the salary differentials. There are many problems in developing policies as to what are important variables. These variables will have to be chosen with each campus in mind. If publication, rate of publication, and quality of publication is an important consideration, the committee will have to decide if there is a reasonable objective way to gather the information. If community service and academic committee work is to be considered, decisions must be made as to the relative weight each of these variables contributes.

Rank was chosen as a variable since the committee felt that there were different standards within the various departments and divisions which were of importance in determining promotion. The committee did not presume to apply their standards to each and every department in the college. Since the available information on faculty members did not include such details as community service, teaching ability, student ratings of teaching ability, peer ratings of teaching ability, or research and publications, it was assumed that rank held would in some respect reflect these differences in academic endeavors. There were those of the committee, however, who felt that one of the problems with using rank was the potential of some systematic bias operating in determining those who would be promoted and those who would not be promoted. Related problems included such

mundane matters as determining whether a Master's of Fine Arts (MFA) was equal to a Ph.D. In this study a decision was made that if the MFA represented a terminal degree in that discipline it would be treated the same way as a Ph.D. in disciplines where the Ph.D. is the terminal degree. Other arbitrary decisions included a decision to consider all individuals with a full professor rank as having the equivalent of a Ph.D. degree.

2) Once these decisions have been made then it is important to be able to develop the mechanism for gathering this data, quantifying it, and putting it into a machine compatible format. If one has survived these first few steps with a reasonable amount of sanity, then the choice of analysis, methods and data presentation must be made.

Once these problems have been successfully dealt with, that only leaves the minor problem of selling the idea to the rest of the faculty, the administration and other outside agencies that might become involved, e.g., the Board of Trustees.

A major problem in dealing with many faculty groups was the lack of understanding about regression analysis. This lack of understanding was manifested in that when 200 out of over 400 are identified as salary differentials, many assumed that this was a blatant example of salary discrimination. Many faculty do not realize that the methodology of the multiple regression technique requires that overpredictions equal underpredictions. A related problem is the lack of quantitative understanding of many faculty members, e.g., that you raise the average salary for a specific rank or category of faculty members by paying an individual more. This upward movement of the mean salary for that faculty group means that those individuals who are given adjustments up to the current mean will still be below the new mean.

Our experience indicates that you can take several approaches to these problems

Table III

Summary of Adjustments Classified by Recipients Reported Race

Race	$\bar{X}$$	S.D.	#Adjustments	%
Black (n=18)	359.80	183.76	5	28
Oriental (n=11)	527.40	292.40	5	45
Spanish Surname (n=2)	299.00	0.00	1	50
Other (n=412)	432.82	307.12	203	49
Total 443			214	48

Table IV

Summary of Adjustments Classified by Recipients Rank and Sex

		$\bar{X}$\$	S.D.	#	Adj/Group%
Instructor	(n=50)	255.00	129.30	6	12
male	(n=29)	221.50	28.99	2	
female	(n=21	271.75	162.70	4	
Assistant Professor	(n=156)	307.08	221.55	89	57
male	(n=84)	242.67	174.68	46	
female	(n=72)	375.98	246.46	43	
Associate Professor	(n=133)	530.24	308.10	82	62
male	(n=92)	510.32	272.11	56	
female	(n=41)	573.15	426.13	26	
Full Professor	(n=104)	547.54	362.20	37	36
male	(n=80)	602.61	394.10	28	
female	(n=24)	376.22	150.09	9	
Total	443	432.71	303.42	214	
male	285	432.25	309.34		
female	158	433.44	317.16		

Table V

Summary of Adjustments Classified by Recipients Sex and Division

Division		$\bar{X}$$	S.D.	N Adj.	% of Group
Social Science & Humanities					
	male (n=79)	502.08	309.34	38	48
	female (n=27)	498.00	242.84	17	63
Fine Arts					
	male (n=66)	458.97	302.97	35	53
	female (n=30)	468.39	403.08	18	60
Natural Science					
	male (n=77)	301.31	192.46	39	51
	female (n=27)	412.71	310.35	17	63
Education					
	male (n=37)	671.76	387.63	13	35
	female (n=36)	497.13	360.57	16	44
Applied Science					
	male (n=26)	236.13	173.99	8	31
	female (n=38)	282.69	296.51	13	34
Total					
	male (n=285)	432.25	309.34	132	46
	female (n=158)	433.44	317.16	82	52
	(n=443)			214	48

and depending on one's proclivity for numbers and understanding of the regression approach, you will find varying degrees of support among faculty and administrators. One suggestion made by an administrator was that after the application of the multiple regression equation all those individuals identified as underpaid should be given enough to be brought up to the predicted salary and all those individuals identified as earning more than predicted should have their salaries reduced to their predicted salaries and thus one would have a perfect fit between predictors and criterion in a very short time. The faculty response to this was more in terms of perhaps fitting that individual to a coffin.

Importance of Study

At present, there are salary differentials and/or salary inequities existing on nearly all campuses of higher education. This study demonstrates how one moderately sized master's degree granting institution economically and objectively carried out a salary differential study with procedures and techniques available to the majority of institutions of higher education.

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