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University of Maine System Gender Equity Report

University of Maine System

Associated Faculties of the University of Maine System

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Joint Gender Equity Committee
Associated Faculties of the University of Maine System
And
University of Maine System

Executive Summary

A joint committee representing the University of Maine System and the Associated Faculties of the University of Maine System conducted a study of gender equity in faculty salaries. The average salaries of female faculty are lower than the average salaries of male faculty at all universities in the System when there is no control for factors such as rank, discipline, highest degree, and length of service. To see if gender related salary differences still exist when factors such as rank, discipline, highest degree, and length of service are controlled, the committee used multiple regression analysis to control for these factors and others legitimately related to salary.

The results of the regression procedures indicate that a high proportion of the variation in salaries (over 70%) is explained by the factors included in the study. In assessing the relative weight of being female in determining salary the Committee used a threshold of 2% of male salaries. In other words, the Committee finds evidence of systemic gender inequity when the difference in male and female salaries is 2% or more of the average male salary when controlling for the factors that are legitimately related to salary. The difference in salaries does **not** exceed this threshold at UMF, UMM, UMPI, the UM College of Education, and the USM Colleges of Arts and Sciences; Business; Nursing; Lewiston/Auburn, and Public Policy. The relative weight of being female exceeds the threshold at UMA, for women other than nursing faculty at UMFK, in the UM Colleges of Liberal Arts and Sciences; Extension; Business, Public Policy and Health; and Natural Sciences, Forestry and Agriculture, and the USM College of Education. The Committee recommends systematic adjustments to salaries of female faculty in these areas, following a review of legal standards for such adjustments. The Committee did not reach conclusions about gender equity in the UM College of Engineering and the USM School of Applied Science and recommends a case by case review of faculty salaries in these areas.

Background As part of a collective bargaining agreement between the Associated Faculties of the University of Maine System (AFUM) and the University of Maine System (UMS), a joint committee was established to study the issue of gender equity in faculty salaries. Committee members had considerable expertise in both statistical methodology and pay equity issues. The Committee's work was guided by Dr. Lois Haignere, a prominent national expert on gender equity in faculty salaries. The Committee was charged to issue an advisory report to the parties, who may reopen negotiations upon written notice.

Members of the Committee:

Representing AFUM

Doug Anderson, Assistant Professor of Sociology, University of Southern Maine

Donald Anspach, Associate Professor of Sociology, University of Southern Maine

Deborah Killam, Associate Extension Professor, University of Maine

Ronald Mosley, Jr., Professor of Business Studies, University of Maine at Machias

Margaret Patterson,* Associate Professor of Mathematics, University of Maine at Augusta

Bradley Ritz, Associate Professor of Business and Economics, University of Maine at Fort Kent

F. Stewart Kinley, ex officio, AFUM Director

Representing UMS

Tracy Bigney,* Executive Director of Human Resources

Sally Dobres, Equal Opportunity Coordinator

Suzanne Estler, Associate Professor of Education, University of Maine

Evelyn Silver, Director of Equal Opportunity, University of Maine

Consultant

Dr. Lois Haignere

*Committee Co-Chairs

The Committee notes with appreciation the work of Rachel Rosa in providing computer programming support throughout the project.

Joint Committee Work

The Committee began its work by looking at national studies of gender equity in faculty salaries. This included a review of materials from the University of Wisconsin study and their plan for implementation of equity adjustments. The Committee also reviewed articles on the topic and examined court decisions from various states and federal jurisdictions about gender equity claims in academia. The Committee also solicited responses to several specific questions from University Counsel to guide its work.

Following this initial work, the Committee was organized into two sub-committees. One sub-committee focussed on policy issues; the second carried out a statistical study of the effect of gender on faculty salaries. The statistical sub-committee met with the policy sub-committee to review its preliminary findings; the Committee then carried out additional analyses. This report is from the entire Joint Gender Equity Committee. The report, its findings, conclusions and recommendations reflect the unanimous opinion of the committee.

The Joint Gender Equity Committee issued its first recommendations to the AFUM and UMS negotiating teams in the spring of 1999. These recommendations were incorporated into the collective bargaining agreement as Article 20, I.2. which calls for an equity review in the event of a promotion or individual increase, and as Appendix G which recommends procedures for an equity review of salary at the time of initial appointment.

The University administration subsequently distributed guidelines to System universities to implement these recommended reviews. This initial work of the Committee was aimed at putting procedures in place which will help ensure that inequities are not created in the future and that existing inequities may be discovered and corrected at the time of promotion or through individual increases. These recommendations are attached to this report as Appendix A.

Over the past year the Committee conducted a study of existing faculty salaries (as of October 1999). The Committee examined variations in salaries and sought to determine how those variations were affected by gender. A number of statistical techniques were used in their analyses. The Committee retained Dr. Lois Haignere, a nationally prominent expert on gender equity studies of faculty salaries. Dr. Haignere has conducted numerous studies of salary equity in higher education and was highly recommended by both union and administration representatives. Her book, Pay Checks, A Guide to Achieving Salary Equity in Higher Education, has provided a methodological benchmark for gender equity studies in colleges and universities across the country.

Dr. Haignere provided guidance on technical issues and valuable expertise in the use of regression to analyze gender bias in salaries. With her assistance, multiple regression models (See Paychecks Chapter 5) were employed to determine whether there was statistical evidence of gender inequity in faculty salaries.

The Study

The purpose of the statistical study was to identify the degree to which key factors are associated with variations in faculty salaries. Of particular concern to the analysis was to determine the extent to which variations in faculty salaries were affected by gender after accounting for factors legitimately related to faculty salaries. All 1,205 members of the bargaining unit as of October 1999 were included in the study. Salary information on which the analysis in this report is based was also recorded as of October 1999.

Demographic and employment data and salary information were obtained from October 1999 UMS Human Resources System files. This information was supplemented on an as needed basis. This information was coded and entered into an SPSS data file. Cross tabulations and multiple regression analysis were used to examine variations in salaries.

Variations in faculty salaries result from many decisions made over a period of many years. A number of factors related to the position, the faculty member's qualifications, and the availability of funding affect salary decisions about an individual. The statistical techniques reported here were used to specifically isolate the relationship of gender and salary.

Methodology

Multiple regression is a technique which assesses the relative weight, in practice, of selected factors (independent variables) in determining the factor of interest (dependent variable), in this case annual salary. In the gender equity study the dependent variable is annual salary. The weights of the regression equation indicate the relative value of each independent variable in

predicting salary. The weight for any independent variable is the effect of that variable while holding all the other independent variables constant. For example, if the weight associated with the rank of associate professor is \$10,000, then on average a faculty member's salary is \$10,000 higher due to being an associate professor, if all other variables are equal. The weights in the regression are estimates of the effect of each variable. There is always some unexplained variation that cannot be accounted for by the variables used in the equation.

Models

A regression model consists of the dependent variable and the selected independent variables. Several regression models were constructed using different combinations of the independent variables. Information about the models in which the Committee has the most confidence is presented in Tables 1-2. One approach was to find the amount of dollar differences in salaries. A second approach used the logarithm of the salary as the dependent variable; this assumes any gender difference in salaries is a percent and not a constant dollar amount. When results are consistent across such models there is an indication that the results are reliable.

The relevant factors (i.e. variables) used in the models reported include:

Dependent variable:

Annual salary (converted where necessary to a full-time academic year salary without stipend)

Independent variables:

Rank,

Tenure status, (see below)

Discipline as coded in the Classification of Instructional Programs, National Center for Educational Statistics,

Years in rank (also the square of this number),

Years of UMS service prior to current rank (also the square of this number),

Possession of a doctorate or professional degree (e.g. M.D. or J.D.),

Gender,

Campus (used when examining the whole System),

College (academic college for UM and USM),

Title of Specialist in Cooperative Extension

A complete list of variables is included in Appendix B.

Tenure status was measured by a variable indicating whether a faculty member was “not eligible” for tenure. This variable was included as an independent variable for all universities except UM. It was excluded from the UM analyses for two reasons. First, there is a high correlation (0.77) between this variable and holding the rank of lecturer or instructor. This “multicollinearity” violates the statistical assumption that independent variables are independent of each other. Second, there is a much higher proportion of women than men who are not eligible for tenure. This may indicate that the negative weight in the regression for “not eligible” is masking gender difference.

When regressions were conducted for individual colleges at UM, the “not eligible” variable was excluded from the analyses except for Cooperative Extension and the College of Natural Sciences, Forestry and Agriculture. In these two units the multicollinearity problem was not present.

No variable measuring faculty productivity, performance, or merit was included in the analysis other than rank. These factors are difficult to define and to measure, and no relevant information is available in the human resource data base. More importantly, performance is not a factor in annual salary increases, which are most often distributed as a percentage or a combination of a percentage and flat dollar amount across the board. Because performance is not considered in annual salary increases, it would not be appropriate to use it as an independent variable to explain salary. Performance is, however, the basis for promotion decisions and associated salary increases and is therefore reflected in the rank and years in rank variables.

Level of analysis:

In determining whether to look at the whole System together, at the campus level, or at smaller groups, the Committee had to balance reality (e.g. the System is not one uniform group; salary setting does not occur at the System level) with principles of sound statistical analysis (e.g. not dividing the population into such small groups that no pattern is apparent).

Regressions were run for the full faculty population of the System. However, because salary decisions are made at the university level (or at the college level at UM and USM), more attention should be given to the models for individual universities. Despite the small size of the population at several of the universities, which makes regression results less reliable, the Committee recommends that regression results be examined for individual universities rather than for the System as a whole.

The Committee recognized that UM and USM are complex institutions with relatively large numbers of faculty. Salary setting at UM and USM occurs at the college (or even department) level. Consequently it makes sense to look at salary patterns within each college. To do this the Committee conducted separate regressions for the larger UM colleges: Liberal Arts and Sciences; Natural Sciences, Forestry, and Agriculture; Education; Business, Public Policy and Health; Engineering; and the Cooperative Extension at UM. Due to the relatively small sizes of some of the colleges at USM, separate regressions could not be conducted for all colleges.

Findings

The Committee found that the selected independent variables explain a high proportion of the variation in faculty salaries. This gives us confidence in the specific findings regarding the relative weight of gender in determining salaries. At all universities in the System the average salary for male faculty exceeds the average salary for female faculty. The average difference in salaries of male and female faculty without controlling for any other factors such as rank, discipline, highest degree, and years of service ranges from \$472 at UMFK to \$10,510 at UM. However, when the factors legitimately related to salary are included as independent variables, the difference between male and female salaries is substantially less, ranging from a positive value of \$126 for being female at UMPI to a negative value of \$3,079 at UMA. Review of

salaries at UM and USM by college found variations in the relative weight of female. At USM these values ranged from a negative value of \$117 in the USM College of Arts and Sciences to a negative value of approximately \$2,000 in the USM College of Education. UM college values for being female range from a negative \$173 in the College of Education to negative \$1,647 in the College of Business, Public Policy and Health.

The finding that there are differences between salaries of men and women does not, in itself, indicate that there are gender-based inequities or that these inequities are systemic. The regression technique finds relationships among variables. A small difference in salaries favoring either men or women is not considered evidence of systemic inequity in salaries, because the differences fall within the area of normal statistical variation.

At what threshold level differences explained by gender can be characterized as inequities is subject to individual judgment and to legal standards that are not clearly spelled out. Dr. Haignere, in her consulting, typically looks for differences of roughly \$1,000 for considering corrections in salaries. The Committee discussed possible threshold levels using the dollar amount of \$1,000 or using a threshold of 1.5 or 2 percent. The Committee recommends that when the difference in male and female salaries exceeds 2% of the average male salary for the university or college, systematic adjustments should be made. However, the University and AFUM should not implement any changes to correct this imbalance without a legal review of what actions may be permissible or required under federal and state law. Table 3 shows what 2% of the average male salary is for each unit analyzed.

Table 1 presents the committee's findings using two regression models. For all campuses except UM and USM, the best estimate of the impact of being female on salary is found in Table 1, using two models. In Model 1 (Table 1) the amount specified is salary in dollars. In Model 2 the dependent variable is the logarithm of salary. Consequently, the interpretation of the weight for being female is a percent rather than a dollar amount. The independent variables are identical for the two models. Results are presented for each campus and for the System as a whole. However, the Committee does not recommend use of the information for the System as a whole or of the campus-level results for UM and USM, as described earlier in Level of Analysis.

University of Maine

The best estimate of the impact of being female on salary at UM is in Table 2, which presents each major college with regressions run separately. Cooperative Extension is treated as a college for this study. In four of the six units the difference between male and female salaries exceeds the 2% threshold used by the Committee. In the College of Education the difference between male and female salaries does not exceed the threshold.

No result is reported for the College of Engineering. The Committee conducted several regression studies for the College of Engineering and the results varied widely depending on whether lecturers and instructors were included and whether engineering and engineering technology were considered one or two disciplines. The results were not consistent as to whether being a female had a positive or negative impact on salary. As a result the Committee does not have confidence in the regression results for this college. Because there are only five female faculty in this college, UM should undertake a careful case by case review of individual salaries to determine whether adjustments are needed.

University of Southern Maine

While salary decisions at USM are made at the college level, the number of faculty in several colleges is too small to allow a detailed analysis. A separate regression of the College of Arts and Sciences (185 faculty) at USM found a negative value of \$117 for the female variable. After reviewing the results of regressions which included college factors at USM the Committee estimates a negative value of approximately \$2,000 for the female variable in the College of Education. This exceeds the 2% threshold used by the Committee. The USM School of Applied Science has only two female faculty. The regression indicated a large negative value for being female in this college. Because of the small number of women, the Committee does not have confidence in the statistical result and believes a careful review of the individual salaries of female faculty in the School of Applied Science should occur.

University of Maine at Fort Kent

The results for the Fort Kent campus take into account the following information. It became apparent during the course of the study that four nursing faculty at UMFK had significantly higher salaries than other faculty due to market competition and the need to attract nursing faculty to the region. Initially nursing faculty were included in a discipline group for professional programs in an effort to attain groups large enough for analysis. When this grouping was used, the value for being female at UMFK was positive. To understand the effect of the female nursing salaries on the total female faculty in this study, two approaches were used: 1) assigning the nursing faculty a separate discipline group and 2) looking at Fort Kent without the nursing faculty. In both of these cases the value for being female became negative. From these results it was apparent that female nursing faculty are not affected by gender inequity. As a result, the models which are reported exclude the nursing faculty. Any remedy applied at UMFK should not apply to nursing faculty.

University of Maine at Augusta

One complicating factor in evaluating the gender effect on salary for UMA was the fact that the Bangor location of UMA (previously Bangor Community College, which was part of UM) had been merged with the Augusta/Lewiston location of UMA several years ago. Although the locations of UMA have different histories, the gender effect on salaries for the two locations of UMA is reported as a single campus, because they are now one institution.

Although our models are not able to explain all salary differences, it is possible that some of our numbers chosen are conservative estimates. For example, some variables, such as rank and eligibility for tenure, that are important to explaining salary differences, may reflect unequal treatment of men and women. If there are inequities in promotion or in tenure-track hiring, then some of the weight for these variables may underestimate the negative effect on salaries of being female.

Definition of terms in the tables: (Also See Appendix C for definitions of technical terms.)

Adjusted R² –the multiple correlation coefficient; this is interpreted as the percentage of the variation in salaries which is explained by the predictor (or independent) variables in the

analysis. An adjusted R^2 of 0.70 or higher indicates that the equation explains a high proportion of the variation and gives us confidence in the results.

The adjusted R^2 for all regressions used by the Committee is 0.70 or higher, indicating that the variables in the analysis together have a strong ability to predict faculty salaries.

b Female – the weight in the regression equation for the variable FEMALE. The interpretation of this weight is the number of dollars on average that it costs (if negative) or profits (if positive) a faculty member to be female. A high negative number indicates statistical evidence of inequities in salaries affecting females. When log of salary is the dependent variable, as in Table 1- Model 2, the interpretation is approximately a percentage of the salary rather than a dollar amount. For example, a coefficient of -0.03 would indicate that the cost of being female is approximately 3% of the average male salary.

Number of cases – the number of faculty in each regression study. The number of female faculty, as well as the total number of faculty is noted in the tables. Any regression analysis that includes fewer than 100 cases should be interpreted with caution. Several universities in the System have fewer than 100 faculty. However, because salary setting occurs at the University level, the Committee conducted analyses for each university, rather than combining them, despite the small number of cases. In a parallel manner the Committee conducted analyses of colleges at UM despite numbers of faculty less than 100.

Table 1 - Overall Summary of Gender Differences in Salaries

	<u>UM</u>	<u>UMA</u>	<u>UMF</u>	<u>UMFK</u>	<u>UMM</u>	<u>UMPI</u>	<u>USM</u>	<u>System</u>
Average Salary	\$53,500	\$44,811	\$43,041	\$40,952	\$40,358	\$41,636	\$51,371	\$49,937
Average Gender Difference* (female salary –male salary)	-10,713	-6,955	-5,231	-472	-4,465	-2,534	-8,284	-8,850
<u>MODEL 1</u>								
Salary Difference** (Adj.R ²)	-1,749 (0.836)	-3,079 (0.734)	-49 (0.944)	-1,758 (0.895)	-388 (0.908)	168 (0.949)	-851 (0.835)	-1,009 (0.805)
<u>MODEL 2</u>								
Log (%) Salary Difference** (Adj.R ²)	-0.034 (0.847)	-0.064 (0.755)	0.001 (0.943)	-0.037 (0.915)	-0.007 (0.925)	0.004 (0.938)	-0.018 (0.838)	(-0.022) (0.823)
% times Average male salary	-1,918	-3,070	28	-1,541	-299	+170	-963	-1149
# of Female Faculty	173	45	42	13	15	23	125	436
Total # of Faculty	547	102	105	31	41	59	320	1,205

*This is the difference between the average male salary and the average female salary without controlling for any variables such as rank, highest degree, discipline, and length of service.

** This is the value of being female when controlling for the independent variables such as rank, highest degree, discipline, and length of service.

See Appendix D for tables with weights for all dependent variables

Table 2 – Gender Differences in 1999 Salaries by College, UM

University of Maine Separate Regressions by College	Salary Difference**	Adjusted R²	Number of Cases: (#Women, Total #)
*Liberal Arts & Sciences	-\$1,491	0.837	(67, 212)
*Business, Public Policy and Health	-1,647	0.947	(21, 34)
Cooperative Extension	-1,198	0.812	(29, 59)
*Education	-173	0.855	(22, 53)
Natural Sciences, Forestry, and Agriculture	-1,480	0.787	(29, 132)

*In these colleges, the variable NOTELIGIBLE for tenure was excluded from the model, as described in the Methodology Section.

** This is the value of being female when controlling for the independent variables such as rank, discipline, highest degree, and length of service.

- In the model for Cooperative Extension, a variable indicating whether a faculty member’s title was Educator or Specialist was included.
- Faculty who are not assigned to the colleges listed were included in the college most appropriate to their discipline. For example, lecturers in Athletics were included in the College of Education; faculty in the Maine Agricultural and Forestry Experiment Station were included in the College of Natural Science, Forestry and Agriculture.
- No salary difference is reported for the College of Engineering. The Committee conducted several regression studies for the College of Engineering and found that results varied widely. See text.

Table 3 – 2% of Average Salaries for Men Faculty by University and College
 (Threshold for finding evidence of systemic inequities)

	<u>2%</u>	<u>Average male salary</u>
UM	\$1,138	\$56,888
UMA	\$ 958	\$47,879
UMF	\$ 903	\$45,134
UMFK	\$ 823	\$41,150
UMM	\$ 840	\$41,991
UMPI	\$ 852	\$42,624
USM	\$1,092	\$54,607

UM Colleges

Liberal Arts and Sciences	\$1,095	\$54,727
Business, Public Policy & Health	\$1,318	\$65,917
Cooperative Extension (academic-year equivalent)	\$ 933	\$46,638
Education	\$ 935	\$46,764
Engineering	\$1,363	\$68,139
Natural Sciences, Forestry & Agriculture	\$1,183	\$59,144

USM Colleges

Arts and Sciences	\$1,063	\$53,127
Applied Science	\$1,207	\$60,354
Business	\$1,310	\$65,499
Education	\$1,060	\$52,994
Lewiston-Auburn	\$ 772	\$38,618
Nursing	\$ 854	\$42,694
Public Policy	\$1,208	\$60,382

Overall Conclusions

The Committee unanimously reached the following conclusions from the regression results. The Committee's conclusions are based on overall patterns and statistical relationships in the data. It is important to note that not all differences in salaries related to gender indicate inequities. A small difference cannot be identified as an inequity with this methodology, nor can any individual faculty member's situation be identified as an inequity.

- The data show no statistical evidence of systemic gender inequity at UMF, UMM, UMPI, the College of Education at UM, and at USM in the Colleges of Arts and Sciences; Business; Public Policy; Nursing; and Lewiston/Auburn. While there is no evidence of systemic inequity, there may still be isolated individual cases of gender inequity. An individual who is concerned about gender inequity should pursue an adjustment through the existing process for individual adjustments or an equal opportunity complaint.
- The Committee does not have confidence in the statistical results for the School of Applied Science at USM and the College of Engineering at UM. UM and USM should conduct a careful review of faculty salaries in these colleges to determine whether adjustments are appropriate. Because of the small number of women in these units, a case by case review is feasible and appropriate.
- The data show statistical evidence of gender differences in faculty salaries exceeding 2% of the average male salary in the UM colleges of: Liberal Arts and Sciences; Business, Public Policy and Health; Cooperative Extension; and Natural Sciences, Forestry, and Agriculture; the USM College of Education; for the non-nursing female faculty at UMFK, and at UMA. Systematic adjustments to salaries are recommended to correct the imbalance.

Recommendations

To remedy gender inequity, the Committee recommends that systematic adjustments be made to the salaries of women faculty in the units cited above where the difference in salary exceeds 2% of the average male salary. The Committee further recommends that a similar analysis of faculty salaries be conducted in three years to determine whether there continue to be gender inequities. In order to facilitate such a review the University should maintain data on rank at hire, subsequent dates of advancement to higher ranks and the year of highest degree for each faculty member.

The Committee identified a variety of possible approaches to remedying gender inequity in salaries and noted some advantages and disadvantages of each approach. Ten possible approaches are listed in Appendix C with the advantages and disadvantages identified. The Committee recommends that only the first five approaches be considered in designing any remedies. We do not recommend the options numbered six through ten.

General considerations:

- For any remedial approach which is considered, the University and AFUM need to look at legal standards for remedies. The Committee noted the criteria from case law that any remedy must be to correct a "conspicuous imbalance" or "manifest imbalance" and must be "narrowly tailored" to correct the imbalance. A remedy that does not meet these criteria is more likely to be found flawed by the courts if challenged legally.

- Any remedy should have clearly identified outcomes.
- Any remedy should be statistically based.
- The parties need to be able to identify the cost of any approach up front for responsible budgeting.
- In applying any remedy the University needs to identify salary changes which have occurred since the fall of 1999. If a woman has received an equity increase or a promotion increase above the minimum amount, it may be appropriate to reduce the amount of the gender equity remedy. However, the University should also be sensitive to the impact of across-the-board increases in the last year which may have increased inequity problems.
- Each university or college for which there is a remedy should review the salaries of any women faculty hired after October 1, 1999 to determine whether the remedy should be applied or whether the hiring salary was equitable.
- For the regression study all salaries were converted to academic-year equivalents. For the purpose of implementing any remedy, the remedy amount will need to be converted to a fiscal-year basis for faculty with fiscal-year appointments.
- We recommend that the selected remedy(ies) include a component based on length of service to correct for the increasing effect of inequity over time.

Next Steps

The Committee recommends that this report be widely disseminated in electronic format to faculty and to university administrators. The Committee also recommends that AFUM and UMS jointly conduct meetings to report the findings and to discuss the report with faculty and administrators.

October 16, 2000

APPENDIX A

Guidelines for Appointment Salary

Appendix G of UMS-AFUM collective bargaining agreement:

It is recommended that each campus put in place the following review process for appointments to tenure track faculty positions. The review process is intended to add a stronger review for search and salary equity concerns before an appointment is made in order to avoid unintended inequities which may occur in setting initial salaries.

Each university in the System will specify the details regarding who is responsible and how the review will occur. The following key elements should be included in each procedure.

1. The administrator responsible for faculty hiring (referred to below as Dean/VP/Provost) will set a salary range for the position at the time the search is approved. The salary range will go forward as part of the approval process for the search, though it will not usually be included in vacancy announcements.
2. The Dean/VP/Provost will consult with Equal Employment Opportunity/Human Resources before making a tentative offer to a candidate, in order to review the search and the recommended salary, for any indication of any kind of illegal discrimination. This review must be conducted in a time frame which does not jeopardize the ability to hire the selected candidate.
3. Equal Employment Opportunity/Human Resources will review and sign off on the appointment before it is officially extended.
4. Annually the Dean/VP/Provost and Equal Employment Opportunity/Human Resources will conduct a review of hiring salaries for equity considerations.

APPENDIX B

Variables Used in Regression Procedures

Dependent variable

BASESAL – annual base salary (excluding any stipend), converted to an academic-year equivalent for those with fiscal-year appointments, converted to a full-time equivalent for those in shared appointments or partial/phased retirement

SALBASLG – the logarithm of the BASESAL

Independent variables – unless otherwise noted all variables are coded 0 or 1 (“dummy variables”) to indicate whether the characteristics applies to the faculty member. When a series of dummy variables is used to represent the values of a single dimension, such as rank, one value is omitted (the default group) to allow the regression statistics to operate correctly. The omitted group is identified in the descriptions of dummy variables below.

Discipline variables: Variable categories are based on the Classification of Instructional Programs of the National Center for Education Statistics at the 2-digit level of specificity. The discipline code for each faculty member was assigned by the campus. Where there were too few faculty to allow for analysis of disciplines in a campus or college, similar disciplines were grouped. For example, at UMF, UMM, and UMPI disciplines were grouped into the colleges, schools or divisions of the campus. The discipline English Language and Literature was the omitted group in regressions. Consequently, no variable for English is listed below. Where there are separate regressions for a college that does not include English faculty a different discipline was omitted.

AGPROD – Agricultural Business and Production

AGSCI – Agricultural Sciences

NATRES – Conservation and Renewable Natural Resources

ARCHIT – Architecture and Related Programs

COMMUN – Communications

COMPUTER – Computer and Information Sciences

EDUCAT – Education

ENGR – Engineering

ENGRTECH – Engineering Technology

FORLANG – Foreign Languages and Literatures

HOMEEC – Home Economics

BIOSCI – Biological Sciences/Life Sciences

MATH – Mathematics

PARKSREC – Parks, Recreation, Leisure, and Fitness Studies

PHILOS – Philosophy and Religion

PHYSSCI – Physical Sciences

PSYCH – Psychology

PROTECT – Protective Services and Legal Studies

SOCWK – Public Administration and Services , includes Community Organization, Public Administration, Social Work, Public Policy Analysis

SOCSCI – Social Sciences, Ethnic/Area Studies and History

ARTS – Visual and Performing Arts
HEALTH – Health Professions and Related Sciences
BUSINESS – Business Management and Administrative Services

Rank – Assistant Professor is the omitted group in the regression procedures
ASSOC – Associate Professor, Associate Extension Professor, Associate Research Professor
PROF – Professor, Extension Professor, Research Professor
LECTINSTR – Lecturer or Instructor

Tenure Status – Tenured and Tenure eligible were combined and together were the omitted group
NOTELIG – Not eligible for tenure

Gender- The default group was male faculty.
FEMALE

Years of Service and in Rank – These are not dummy variables. They are measured in years of completed service. Squared variables were added because they are better able to measure the effect of a non-linear relationship. Service was divided into two non-overlapping periods, years prior to current rank, and years in current rank.

YRPRRANK – Years of continuous, regular service in the University of Maine System prior to the current rank
YRPRRANK2 – YRPRRANK squared.
YRSRANK – Years in current rank
YRSRANK2 – YRSRANK squared

Highest degree- The default group was those without a doctoral or professional degree.
DOCTOR – having a doctoral or professional degree (e.g. JD, MD)

Appointment type- The default group was those with academic-year appointments.
FISCAL – Having a fiscal-year appointment

Title of Specialist- The default group was the faculty with the title of Educator in the Cooperative Extension.
SPECIALIST – having the title Specialist in Cooperative Extension

APPENDIX C

Definitions of Statistical Terms

Adjusted R^2 –the multiple correlation coefficient; this is interpreted as the percentage of the variation in salaries which is explained by the predictor (or independent) variables in the analysis.

b– the weight (regression coefficient) in the regression equation for a variable.

Dependent variable – The variable predicted by a multiple regression equation.

Independent variables – The variables selected for use in a multiple regression equation to predict the dependent variable.

Logarithm – The exponent that indicates the power to which a number is raised to produce a given number.

Multicollinearity The amount of intercorrelation among independent variables. Multiple regression assumes that the independent variables are not correlated with each other.

Multiple regression A statistical technique which predicts values of one dependent variable by combining the predictive power of several independent variables by means of an equation.

N The number of cases

Validity – The degree to which a statistical process actually measures the intended variable

Variable --A characteristic or property that can be categorized or measured.

Appendix D Regression Results

Dependent variable: Annual base salary

Independent Variable:	UM		UMA		UMF		UMFK	
	b	beta	b	beta	b	beta	b	beta
Female	-1,749	-0.060	-3,079	-0.186	-49	-0.002	-1,758	-0.109
Lecturer/Inst.*	-1,789	-0.037	-3,610	-0.095	-1,507	-0.055	-7,620	-0.190
Assoc.	8,073	0.285	2,847	0.173	5,724	0.229	2,081	0.114
Prof.	20,117	0.690	8,832	0.498	12,629	0.622	2,955	0.171
Not Elig.	omitted	omitted	-1,828	-0.069	-1,281	-0.051	707	0.029
Discipline (low)**	-2,376	-0.023	-3,550	-0.116	-76	-0.004	58	0.003
Discipline (high)**	30,045	0.336	6,308	0.256	NA	NA	2,700	0.175
Doctorate	2,583	0.080	2,143	0.126	-295	-0.013	2,859	0.178
Years in rank	392	0.212	-84	-0.071	461	0.330	-496	-0.309
Years in rank sq.	5	0.063	23	0.413	9	0.140	80	0.740
Years prior to rank	-687	-0.285	320	0.251	-13	-0.007	-8	-0.006
Years prior to rank sq.	34	0.249	-1	-0.012	11	0.093	48	0.611
Fiscal	-8,241	-0.217	NA	NA	10,792	0.107	NA	NA
Specialist (UM)	1,085	0.015	NA	NA	NA	NA	NA	NA
R square	0.846		0.781		0.950		0.943	
Adjusted R Square	0.836		0.734		0.944		0.895	
Std Error (Equation)	5,527		4,269		2,339		2,509	
Std Error b (Female)	598		1,164		535		1,186	
Number of cases	547		102		105		27	
Sign. F (equation)	0.0000		0.0000		0.0000		0.0000	
Sign. T (Female)	0.004		0.010		0.928		0.161	

* The default category for rank is assistant professor.

** Discipline is a series of dummy variables. Values shown are for the lowest and highest disciplines. Discipline weights are relative to the default group (usually English). At all universities except UM and USM like disciplines were combined as needed to create groups large enough for analysis. At UMF, UMM and UMPI discipline groups follow established colleges and schools.

Notes

b The regression weight for the variable

beta The standardized regression weight.

Significance levels are listed to be used as one piece of information in weighing the importance of results. Because this study is based on a population rather than a sample, statistical significance is not strictly applicable.

Appendix D Continued Regression Results

Dependent variable: Annual base salary

Independent Variable:	UMM		UMPI		USM		System	
	b	beta	b	beta	b	beta	b	beta
Female	-388	-0.025	168	0.012	-851	-0.036	-1,009	-0.38
Lecturer/Inst.*	NA	NA	-3,033	-0.131	-4,316	-0.066	-2,136	-0.044
Assoc.	825	0.055	3,737	0.242	5,633	0.246	5,555	0.213
Prof.	8,660	0.487	7,173	0.465	18,548	0.694	16,384	0.592
Not Elig.	-86	-0.003	-1,654	-0.092	-4,449	-0.117	-1,514	-0.040
Discipline (low)**	1,492	0.100	461	0.033	-3,288	-0.050	-2,461	-0.029
Discipline (high)**	2,369	0.150	NA	NA	14,724	0.354	15,753	0.267
Doctorate	-664	-0.045	122	0.008	2,936	0.099	3,287	0.115
Years in rank	637	0.553	225	0.245	636	0.420	396	0.229
Years in rank sq.	10	0.163	12	0.401	-8	-0.128	5	0.063
Years prior to rank	-243	-0.149	-195	-0.166	-108	-0.048	-310	-0.137
Years prior to rank sq.	38	0.271	26	0.401	-0.4	-0.003	19	0.150
Fiscal	NA	NA	-745	-0.014	10,966	0.141	-5,713	-0.120
Specialist (UM)	NA	NA	NA	NA	NA	NA	NA	NA
R square	0.933		0.959		0.850		0.811	
Adjusted R Square	0.908		0.949		0.835		0.805	
Std Error (Equation)	2,265		1,595		4,620		5,586	
Std Error b (Female)	883		518		622		386	
Number of cases	41		59		320		1,205	
Sign. F (equation)	0.000		0.000		0.000		0.000	
Sign. T (Female)	0.664		0.747		0.173		0.009	

* The default category for rank is assistant professor.

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Appendix D Continued Regression Results

Dependent variable: Log of Annual base salary

Independent Variable:	UM		UMA		UMF		UMFK	
	b	beta	b	beta	b	beta	b	beta
Female	-0.034	-0.062	-0.064	-0.172	0.001	0.001	-0.037	-0.096
Lecturer/Inst.*	-0.085	-0.096	-0.126	-0.147	-0.032	-0.050	-0.253	-0.261
Assoc.	0.151	0.285	0.073	0.197	0.139	0.238	0.092	0.208
Prof.	0.341	0.628	0.195	0.487	0.271	0.574	0.117	0.279
Not Elig.	omitted	omitted	-0.041	-0.068	-0.036	-0.061	-0.005	-0.008
Discipline (low)**	-0.042	-0.022	-0.079	-0.115	-0.005	-0.009	0.015	0.032
Discipline (high)**	0.522	0.313	0.145	0.260	NA	NA	0.067	0.178
Doctorate	0.056	0.093	0.053	0.138	-0.001	-0.000	0.059	0.151
Years in rank	0.008	0.240	-0.002	-0.064	0.014	0.438	-0.012	-0.300
Years in rank sq.	0.000	0.037	0.000	0.404	0.000	0.019	0.002	0.672
Years prior to rank	-0.010	-0.223	0.008	0.278	0.003	0.072	-0.002	-0.072
Years prior to rank sq.	0.000	0.238	-0.000	-0.029	0.000	0.043	0.001	0.560
Fiscal	-0.176	-0.248	NA	NA	0.245	0.104	NA	NA
Specialist (UM)	0.040	0.029	NA	NA	NA	NA	NA	NA
R square	0.856		0.799		0.950		0.954	
Adjusted R Square	0.847		0.755		0.943		0.915	
Std Error (Equation)	0.100		0.092		0.055		0.054	
Std Error b (Female)	0.011		0.025		0.013		0.026	
Number of cases	547		102		105		27	
Sign. F (equation)	0.0000		0.0000		0.0000		0.0000	
Sign. T (Female)	0.002		0.013		0.961		0.167	

* The default category for rank is assistant professor.

** Discipline is a series of dummy variables. Values shown are for the lowest and highest disciplines. Discipline weights are relative to the default group (usually English). At all universities except UM and USM like disciplines were combined as needed to create groups large enough for analysis. At UMF, UMM and UMPI discipline groups follow established colleges and schools.

Notes

b The regression weight for the variable

beta The standardized regression weight.

Significance levels are listed to be used as one piece of information in weighing the importance of results. Because this study is based on a population rather than a sample, statistical significance is not strictly applicable.

Appendix D Continued Regression Results

Dependent variable: Log of Annual base salary

Independent Variable:	UMM		UMPI		USM		System	
	b	beta	b	beta	b	beta	b	beta
Female	-0.007	-0.019	0.004	0.012	-0.018	-0.039	-0.022	-0.042
Lecturer/Inst.*	NA	NA	-0.077	-0.148	-0.135	-0.106	-0.069	-0.072
Assoc.	0.050	0.136	0.092	0.263	0.126	0.280	0.115	0.225
Prof.	0.224	0.518	0.170	0.486	0.344	0.658	0.299	0.549
Not Elig.	-0.003	-0.004	-0.048	-0.119	-0.115	-0.155	-0.056	-0.075
Discipline (low)**	0.041	0.113	0.010	0.033	-0.046	-0.030	-0.044	-0.027
Discipline (high)**	0.054	0.141	NA	NA	0.266	0.327	0.271	0.234
Doctorate	-0.017	-0.047	0.004	0.011	0.049	0.084	0.062	0.110
Years in rank	0.015	0.539	0.007	0.344	0.013	0.431	0.010	0.281
Years in rank sq.	0.000	0.108	0.000	0.241	-0.000	-0.153	0.000	0.011
Years prior to rank	-0.005	-0.125	-0.004	-0.155	-0.000	-0.007	-0.004	-0.081
Years prior to rank sq.	0.000	0.256	0.000	0.380	-0.000	-0.014	0.000	0.133
Fiscal	NA	NA	0.017	-0.014	0.245	0.161	-0.114	-0.122
Specialist (UM)	NA	NA	NA	NA	NA	NA	NA	NA
R square	0.946		0.951		0.853		0.829	
Adjusted R Square	0.925		0.938		0.838		0.823	
Std Error (Equation)	0.049		0.040		0.090		0.104	
Std Error b (Female)	0.019		0.013		0.012		0.007	
Number of cases	41		59		320		1205	
Sign. F (equation)	0.0000		0.0000		0.0000		0.0000	
Sign. T (Female)	0.715		0.758		0.145		0.003	

* The default category for rank is assistant professor.

** Discipline is a series of dummy variables. Values shown are for the lowest and highest disciplines. Discipline weights are relative to the default group (usually English). At all universities except UM and USM like disciplines were combined as needed to create groups large enough for analysis. At UMF, UMM and UMPI discipline groups follow established colleges and schools.

Notes

b The regression weight for the variable

beta The standardized regression weight.

Significance levels are listed to be used as one piece of information in weighing the importance of results. Because this study is based on a population rather than a sample, statistical significance is not strictly applicable.

Appendix D Continued
Regression Results
University of Maine Colleges

Dependent variable: Annual base salary (excludes not eligible)

	Arts & Sciences		Forestry, Natural Science & Agriculture		Extension		Education		Business & Health	
	b	beta	b	beta	b	beta	b	beta	b	beta
Independent Variable:										
Female	-1,491	-0.053	-1,480	-0.051	-1,198	-0.081	-173	-0.009	-1,647	-0.050
Lecturer/Inst.*	-5,577	-0.139	5,013	0.062	-4,481	-0.078	-1,979	-0.089	-8,368	-0.149
Assoc.	6,742	0.247	7,731	0.301	5,642	0.379	5,833	0.290	3,942	0.118
Prof.	18,477	0.675	22,076	0.888	10,072	0.649	12,559	0.495	13,635	0.303
Not Elig.	omitted	omitted	-6,447	-0.111	1,361	0.051	omitted	omitted	omitted	omitted
Discipline (low)**	-2,641	-0.043	-2,996	-0.030	416	0.028	NA	NA	-26,390	-0.774
Discipline (high)**	20,531	0.302	6,274	0.045	621	0.021	NA	NA	-25,724	-0.735
Doctorate	898	0.028	4,504	0.094	2,294	0.188	-1,054	-0.051	2,804	0.075
Years in rank	714	0.451	-17	-0.010	-74	-0.051	363	0.283	-1,044	-0.326
Years in rank sq.	-5	-0.083	22	0.318	40	0.503	0.231	0.004	89	0.502
Years prior to rank	-629	-0.282	-469	-0.207	84	0.062	354	0.223	560	0.161
Years prior to rank sq.	32	0.282	11	0.071	16	0.258	2	0.018	-27	-0.099
Fiscal	395	0.005	-6,280	-0.131	NA***	NA	-7,031	-0.289	NA	NA
Specialist (UM)	NA	NA	NA	NA	3,719	0.237	NA	NA	NA	NA
R square	0.853		0.819		0.854		0.883		0.965	
Adjusted R Square	0.837		0.787		0.812		0.855		0.947	
Std Error (Equation)	5,245		5,616		3,249		3,666		3,718	
Std Error b (Female)	917		1,427		1,155		1,062		1,667	
Number of cases	212		132		59		53		34	
Sign. F (equation)	0.0000		0.000		0.000		0.000		0.0000	
Sign. T (Female)	0.106		0.302		0.305		0.872		0.334	

* The default category for rank is assistant professor.

** Discipline is a series of dummy variables. Values shown are for the lowest and highest disciplines. Discipline weights are relative to the default group (usually English). At all universities except UM and USM like disciplines were combined as needed to create groups large enough for analysis. At UMF, UMM and UMPI discipline groups follow established colleges and schools.

*** All Extension faculty have fiscal-year appointments, so there is no variation in this variable for this regression.

Notes

b The regression weight for the variable

beta The standardized regression weight.

Significance levels are listed to be used as one piece of information in weighing the importance of results. Because this study is based on a population rather than a sample, statistical significance is not strictly applicable.

APPENDIX E

Options for Designing Remedies

The Committee identified the following ten approaches to designing remedies for universities or colleges where gender inequity is found. We recommend that the first five options listed be considered in designing remedies. We do not recommend the options numbered six through ten.

1. Flat dollar amount for each woman where inequity is identified. For example, if we identified an average inequity of \$1,000 at a university or college, every woman faculty member in that unit would receive an adjustment of \$1,000

Advantage

- Quick and objective
- Assumes that gender bias and the resulting salary bias is systemic and institutionalized and generally affects all women faculty
- Avoids judgments that could incorporate bias
- Affects both those above and below the average regression line (on the premise that the salaries of women above the line are not free from inequity and should be further above the line)
- All women receive an adjustment, so there is less potential for hard feelings

Disadvantage

- Favors individuals more recently hired by providing the same dollar adjustment as for those who have had any inequity compounded for years

2. Flat percentage adjustment for each woman where inequity is identified. For example, if the estimate of the inequity was 5% of male salaries, each woman would receive an adjustment necessary to correct the 5% deficit.

Advantage

- All the same advantages as listed for flat dollar amount
- Recognizes longevity by basing the adjustment on the current higher salary for women with long service
- Equally proportionate to base salary

Disadvantage

- A percentage on a low salary is a lower amount, which may disadvantage women with the lowest current salaries. Lower salaries may not reflect only less longevity. For example, women in low paid disciplines, which may be low paid because women predominate (pay equity) will have lower adjustments than women in high paid disciplines.

3. Different types of remedies for the different affected units, designed and recommended by the Committee. For example, a flat dollar amount at one university/college and a percent at another.

Advantage

- Appropriate solution may vary between campuses and colleges
- Consistent with decentralized process for hiring and promotions
- Narrowly tailored

Disadvantage

- Inconsistent types of remedies across units of the System might create hard feelings, because individuals may feel they would have benefited more from a remedy used elsewhere in the System
- Might be complex to administer

4. Combine a dollar amount with a measure of longevity (e.g. a flat dollar amount per year of service or a fixed amount plus an amount per year of service)

Advantage

- Takes into account long service faculty for whom any inequity at hiring has been compounded

Disadvantage

- Less favorable for faculty with shorter service hired in at senior ranks

5. Combinations of the above, e.g. a flat amount plus a percent. Need to assess advantages and disadvantages based on specific proposal; there are many possible options

THE FOLLOWING ARE NOT RECOMMENDED:

6. Use the residual from the regression to determine an individual adjustment for each woman

Advantage

- Specific to individual
- Narrowly tailored

Disadvantage

- No adjustments for women whose salaries are above the average for comparable males, but may still be lower than they should be. In other words, star women faculty may still be paid below the star men faculty even though they are paid above the male average.
- Might be seen as discriminating against men whose salaries are below the male average.
- Multiple regression is not designed to be used this way, doesn't account for all unique factors not captured in the data
- Assumes everyone should be "average"

7. Identify comparator male faculty for women and base the individual adjustment on salaries of comparators

Advantage

- Narrowly tailored
- May consider performance variables
- Might recognize inequities that have fallen unequally on some women, i.e. pockets of individual prejudices that have only affected those individual women who are hired and rewarded by those with the prejudices

Disadvantage

- Anyone with an extraordinary claim may already file a request for individual adjustment or EEO complaint.
- Difficult to identify comparators who are nearly identical to women faculty in discipline, service, degree, rank, etc. In fact, in some smaller units there may be no comparators.
- Introduces judgments which may be biased

- Time consuming
- May leave decisions to those responsible for the current problem
- Sets up an adversarial, competitive environment among faculty
- May create hard feelings because people are treated differently
- Complex
- Would result in differing criteria

8. Allocate a pool of money for adjustments. Distribute a portion as a flat amount or percent across the board and save an amount for appeals and individual situations

Advantage

- Recognizes that inequity may not be an equal amount or percent for all women

Disadvantage

- Individuals with extraordinary claims already have the option to file a request for individual adjustment or EEO complaint.
- Adds workload to the person who has been affected by the inequity
- Women may be reluctant to be seen as complaining
- Time consuming
- May be seen as reverse discrimination by men who are not allowed to apply

9. Individual woman applies for an adjustment

Advantage

- Narrowly tailored
- Recognizes that inequity may not be an equal amount or percent for all women
- Presumes that salary bias results from isolated personal prejudices that may cause some pockets of salary disparities.

Disadvantage

- All of the disadvantages listed under 8

10. Let the campus design a process that fits its needs, within established parameters

Advantage

- Appropriate kind of solution may vary between campuses
- Consistent with autonomy of universities and colleges for hiring and promotions

Disadvantage

- Campus solution may not pass legal criteria
- Inconsistent treatment across the System leading to different outcomes
- Complex to administer
- May create hard feelings because people are treated differently
- Could put the decisions in the hands of those that have administered the current salaries