UNIVERSITY *of* MISSOURI

OFFICE OF THE PROVOST

Fall 2015

Dear Members of the MU Community:

During the 2013-2014 academic year, the Chancellor's Status of Women Committee (co-chaired by Michael Urban and Jordan Hoyt) and the Status of Women Committee in the College of Arts and Science (chaired by Linda Reeder) independently requested that the campus complete a rigorous, external analysis of faculty salaries on issues related to equity. After carefully reviewing the request, Chancellor Loftin and then Interim Provost Ken Dean decided to proceed. In consultation with the Status of Women Committees, MU selected Dr. Robert K. Toutkoushian to conduct our study. A Professor of Higher Education in the Institute of Higher Education at the University of Georgia, Dr. Toutkoushian specializes in faculty/staff compensation, and his work on faculty compensation has been widely published. A more detailed description of his qualifications is provided in this report.

The intent of this study was to examine salary equity broadly across the MU campus. I am heartened to learn that there is no evidence of systemic problems regarding salary equity at this level. Still, we have to recognize the limits of a study of this kind. Because of methodology, non-tenure track faculty and faculty in Law and Medicine were not able to be included, and the study also was not designed to examine salary equity in individual units. Nor can a study of this kind tell us about the intersections of gender and race or whether those variables that do explain salary differences between different populations of faculty are themselves influenced by gender and race.

At the same time that we recognize what this study can and cannot tell us, it also provides valuable information, and I will work with the deans to consider these data as we make salary decisions. More broadly, we must all continue to address the ways in which gender and race can have an impact on rank, administrative experience, and research productivity—factors shown to affect faculty salaries. This study can also serve as a valuable baseline for comparison with future studies of this kind. Ideally, we will conduct a similar analysis in five years, as recommended in this report.

Finally, I want to thank a number of people who were instrumental in seeing this report to fruition, especially the members of the Status of Women Committees for their leadership in pursuing this study, staff members in Institutional Research and Quality Improvement (most notably Dr. Mardy Eimers and Dr. Kathy Schmidtke Felts) for providing Dr. Toutkoushian the necessary data and for overseeing much of this process, and Dr. Toutkoushian, for his careful and rigorous analysis and his patient answering of our many questions.

My hope is that we all view this report as an important—but hardly final—step in ensuring that we have an inclusive and equitable campus.

Sincerely,

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Provost and Executive Vice Chancellor

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Internal Salary Equity Study for the University of Missouri

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Executive Summary

In this study, I investigated whether there was evidence of pay discrimination in gender and race or salary compression for faculty at the University of Missouri in the 2014-15 academic year. The cohort examined consisted of full-time, tenured and tenure-eligible faculty at the University of Missouri in the 2014-15 academic year. After excluding faculty from the School of Medicine and those with missing data on variables used in the study, the dataset consisted of 966 faculty members. I applied multivariate statistical techniques to data obtained from the institution to investigate these issues. The approaches and model specifications that I used here followed the accepted practices of leading analysts in the field.

The results of my analysis are summarized as follows: First, with regard to gender, I found that after taking into account personal and work-related characteristics that should affect salary, there was no evidence of an average unexplained earnings difference in favor of male faculty members. The average unexplained earnings gap between men and women ranged from 0.3% to 1.5% and in no instance was statistically significant at the 5% level or lower. This result held regardless of whether a single- or two-equation approach was used to measure gender-based pay inequities, as well as whether the analysis focused on specific colleges and academic divisions within the University of Missouri. Likewise, this conclusion was not affected by whether the salary model controlled for academic rank.

Second, the results showed that for the university as a whole, there was not statistically-significant pay disadvantage for faculty in traditionally underrepresented race/ethnicity categories. The estimated levels of pay disparity for underrepresented faculty ranged from -

0.03% to +3.5% across a range of models and methods. Disaggregated salary models, however, revealed that there was a negative and statistically significant pay disadvantage for underrepresented faculty in the College of Engineering. The findings for race/ethnicity held regardless of whether academic rank was controlled for in the model, and whether a single- or two-equation approach was used to measure the unexplained wage gap.

Finally, with regard to salary compression, I found that overall the salaries paid to less-experienced ("junior") faculty members at the University of Missouri were comparable to what would be predicted based on the salary profiles for more-experienced ("senior") faculty members at the university. This result held for three alternative definitions of who is counted as a junior faculty member. In contrast, when faculty members with between four and five years of experience are added to the junior faculty group, their average salaries were 2.7% higher than predicted by the model, with the difference being statistically significant at the 1% level. This finding is consistent with the notion of salary compression. Additional analyses, however, revealed that the appearance of salary compression is concentrated among faculty in the Trulaske College of Business. Removing the College of Business from the analysis showed that for the rest of the University there was no evidence of salary compression. Therefore, there was no consistent evidence of overall salary compression between junior and senior faculty at the University of Missouri.

The key recommendations from the study are: (1) examine the salaries and qualifications of underrepresented faculty in the College of Engineering for possible inequities; (2) examine the salaries of senior faculty in the College of Business for salary compression; and (3) develop a procedure to reexamine salary equity on a periodic basis.

Internal Salary Equity Study for the University of Missouri

Introduction

With the passage of the federal Equal Pay Act in 1964, employers across the nation became very concerned with ensuring that the manner in which their workers were paid was deemed to be fair and equitable. Subsequent legislation in the early 1970s specified that the fair and equitable treatment of employees with regard to compensation also extends to institutions of higher education. As a result, many internal salary equity studies were conducted in the 1970s and 1980s to examine the salary structures in colleges and universities. In more recent years, a number of institutions have continued to monitor their internal salary structures for evidence of inequitable treatment of particular groups of faculty members.

One of the most persistent themes in the faculty compensation literature is the question of whether male and female faculty members on average receive salaries that are comparable to each other after taking into account personal and work-related factors that are thought to have an effect on their pay. Studies conducted at the national level have shown that female faculty members are often paid less than male faculty even after controlling for characteristics such as educational attainment, academic field/discipline, and years of experience. The findings from institution-specific studies, on the other hand, have been more mixed. Although a number of these institution-specific internal salary equity studies revealed that female faculty members were paid less than male faculty members, other studies have not shown evidence of significant pay differences between the genders. A list of selected studies and readings is provided at the end of this report. The results have also been mixed in the institution-specific studies that I have

conducted.

In recent years, concerns have been raised in academia that faculty salaries are becoming more inequitable with regard to experience level. More specifically, the issue is that junior faculty members were receiving salaries that were higher than dictated by their qualifications in comparison to more senior faculty members. This narrowing of the salary differential between junior and senior faculty members is referred to as "salary compression." Salary compression is an equity issue because it may constitute unfair treatment of more experienced faculty members at the institution.

In the 2014-15 academic year, I was asked by the University of Missouri to conduct a study of the internal salary equity of their faculty. The focus of the internal salary equity study was threefold:

(1) Are female faculty members, on average, paid significantly less than comparable male faculty members?

(2) Are faculty members in underrepresented race/ethnicity groups, on average, paid significantly less than comparable non-underrepresented faculty members?

(3) Are the salaries for less-experienced faculty members significantly higher than would be predicted for their more-experienced colleagues at the same point in their careers?

To answer these questions, I obtained data on all full-time, tenure-eligible faculty members at the University of Missouri (not including the School of Medicine) in the academic year 2014-15. The dataset included information on each faculty member's base salary, years of experience at the institution, highest degree attained, academic field/discipline, race, gender, academic rank,

years of employment at Missouri, and standardized research productivity.

The findings revealed that although male faculty on average earned about 15% more than female faculty at the university, almost all of the total wage gap could be attributed to differences between men and women in the faculty member's rank, years of experience, departmental affiliation, academic position, and research productivity. After taking these factors into account, the remaining (unexplained) wage gap between male and female faculty members in a single-equation model was between -1.4% to -1.5% and was not statistically different from zero at even the 5% significance level. The unexplained wage gap between men and women at the University of Missouri did not change when current rank was not controlled for in the salary model. In the two-equation model, the estimated unexplained wage gaps by gender were even smaller and statistically insignificant regardless of whether rank was controlled for in the model. Taken together, the results did not indicate any clear evidence of a significant average unexplained wage gap between comparable male and female faculty at the University of Missouri.

Similarly, I found that on average underrepresented race/ethnicity faculty earned about 15% less than non-underrepresented faculty. After controlling for the same faculty characteristics as in the analysis for gender, however, the results from the single-equation model showed that underrepresented race/ethnicity faculty did not earn less than comparable non-underrepresented faculty. In the two-equation model, the average salaries paid to underrepresented faculty were in fact higher than would be predicted if they were paid according to the salary structure for non-underrepresented faculty. Nonetheless, I found that there was no evidence that overall faculty in underrepresented race/ethnicity groups at the University of Missouri were paid less than non-underrepresented faculty.

In addition, I conducted analyses of gender- and race-based pay disparities by selected subunits (colleges and divisions) within the University of Missouri where there were a sufficient number of faculty (more than 100) to conduct the analysis. The results showed that there was no evidence of an unexplained pay gap by gender within these subunits. However, there was an unexplained wage gap in the College of Engineering in favor of faculty in non-underrepresented race/ethnicity groups.

With regard to salary compression, the results showed that overall the average salaries for junior faculty (defined as having between two to four years of experience at the University of Missouri) were not paid more than would be predicted for more experienced faculty. However, when the group of junior faculty was expanded to include faculty with five years of experience, the average salary for junior faculty was 2.7% and was significantly higher than their predicted salary. Further analysis revealed that the salary compression was concentrated among faculty in the Trulaske College of Business.

The report begins with a description of the statistical procedures used to investigate gender and racial discrimination in salary. The data and subsequent variables used in the study are described in the second section. The third section describes the results from the analyses of gender and racial pay equity. The final section of the report examines whether there is evidence of salary compression between faculty members with different levels of experience.

Measuring Gender and Racial Disparities in Salary

Most inquiries into possible salary discrimination begin by observing that there is a difference in the average salaries for male and female faculty. This is referred to here as the "total wage gap". It is common knowledge that in many labor markets, women on average earn less than their male counterparts and that the total wage gap between men and women can be sizable. The same phenomenon often occurs as well between minority and non-minority workers. This phenomenon applies to colleges and universities as well as employers in non-academic labor markets. Dating back to the 1970s, the American Association of University Professors (AAUP) has collected and published statistics on the average earnings of faculty at colleges and universities in the United States. Because the salary data are broken down by gender, they can be used to measure the total wage gaps for male and female faculty within any participating institution. Table 1, for example, shows how the average salaries for male and female faculty in 2014-15 compare to each other for selected groups of institutions:

Table 1: Average Salaries for Faculty at AAUP Groups of Institutions by Gender, 2014-15

Group	Average Salary		Total Wage Gap ($)	Total Wage Gap (%)
	Male	Female		
All Public Doctoral[1]	$102,331	$81,174	-$21,157	-21%
All Public Master's	$75,234	$67,245	-$7,989	-11%
All Public Bachelor's	$71,476	$65,217	-$6,259	-9%
Private-Independent Doctoral[2]	$138,491	$107,750	-$30,741	-22%
Private-Independent Master's[2]	$86,760	$76,473	-$10,287	-12%
Private-Independent Bachelor's[2]	$87,849	$78,932	-$8,917	-10%

Notes: Data obtained from *Academe*, March/April 2015. Data are for all faculty ranks combined. Total wage gap ($) = difference in average salaries between male and female faculty. Total wage gap (%) = total wage gap as a percentage of average male professor salary. [1]Comparator group of institutions for the University of Missouri according to the AAUP classification. [2]Only includes private independent (non-religiously affiliated) not-for-profit institutions. Similar breakdowns are not provided by race/ethnicity.

The national data show that within the set of all public doctoral institutions (University of Missouri's group in the AAUP classification scheme), on average female faculty are paid substantially less ($21,157 or 21%) than their male counterparts. Even in less research-intensive institutions where compensation is lower, there are notable differences in the average salaries for male and female faculty. The total wage gap between the genders is particularly large for private doctoral-granting institutions, some of whom are also direct competitors with the University of Missouri for faculty. Taken together, the data show that sizable wage gaps between men and women in higher education markets are the norm and not the exception.

Despite the attention that is often given in the media to average salary differences such as these, experts in faculty compensation recognized early on that the difference in average salaries should not be interpreted as evidence of pay discrimination because it did not take into account possible gender differences in important labor market factors that should legitimately affect salaries. To illustrate, one important reason why the total wage gaps in Table 1 can be misleading is that there is an uneven distribution of men and women across academic ranks. It is usually the case that a higher proportion of male faculty than female faculty are found at the Full Professor rank, where salaries tend to be the highest. Thus more insight into the relative pay of male and female faculty can be obtained by considering the differences in average salary by gender within each rank, as shown in Table 2. The breakdown by rank shows that the average salary gaps between male and female faculty are much smaller within each rank than they are when faculty are combined across ranks.

Table 2: Average Salaries for Faculty by Gender and Rank at AAUP Groups of Institutions, 2014-15

	Full Professors			Associate Professors			Assistant Professors		
Group	**Male**	**Female**	**Gap ($)**	**Male**	**Female**	**Gap ($)**	**Male**	**Female**	**Gap ($)**
All Public Doctoral	$133,468	$119,761	-$13,707	$91,354	$84,997	-$6,357	$80,858	$73,741	-$7,117
All Public Master's	$92,967	$88,509	-$4,458	$75,192	$72,465	-$2,727	$65,124	$62,928	-$2,196
All Public Bachelor's	$88,856	$84,290	-$4,566	$73,860	$70,860	-$3,000	$62,282	$59,706	-$2,576
Private Ind. Doctoral	$181,269	$166,084	-$15,185	$112,937	$104,852	-$8,085	$99,160	$90,328	-$8,832
Private Ind. Master's	$109,707	$101,598	-$8,109	$82,399	$78,260	-$4,139	$70,952	$67,363	-$3,589
Private Ind. Bachelor's	$110,809	$105,158	-$5,651	$81,166	$79,097	-$2,069	$66,097	$64,503	-$1,594

Notes: Information obtained from *Academe*, March/April 2015.

In addition to rank, there are other characteristics of faculty that may also affect their salaries. If these factors are unequally distributed between men and women, or between underrepresented and non-underrepresented race/ethnicity faculty, then they may also affect the total wage gaps between the genders and races. For example, male faculty members typically have more years of experience in academe, on average, than do their female counterparts. Given that employees with more experience are usually expected to earn more than employees with less experience, some of the difference in average salaries between males and females may be rightly attributed to their different experience levels, rather than unfair treatment by the institution. Similar gender differences are often found with regard to average research productivity, and employment rates in higher-paying academic disciplines such as business.

In general terms, this means that the average salary difference or total wage gap between any two groups of employees (such as men and women in Table 1 or race/ethnicity) can be broken down into two aggregate components: the "explained wage gap" and the "unexplained wage gap":

(1) Total wage gap = Explained wage gap + Unexplained wage gap

The explained wage gap is the portion of the total wage gap between the two groups that is attributed to (or explained by) differences in factors such as experience, educational attainment, and rank that should arguably affect salaries. The unexplained wage gap represents the portion of the total wage gap between men and women that cannot be attributed to factors that may legitimately affect salaries. I use the term "unexplained wage gap" to reflect the fact that this

remainder could be due to the effects on salary of justifiable factors that cannot be measured or were not included in the analysis, or the inequitable treatment of men and women (or race). Therefore, the presence of a significant unexplained wage gap does not prove that the employer has engaged in unfair treatment of men and women, but would be evidence to warrant further investigation by the institution.

The standard procedure that researchers use to measure the unexplained wage gaps for gender and race is multiple regression analysis. The advantage of multiple regression analysis is that it allows the investigator to control for or remove the influences of other factors such as rank, labor market experience, educational attainment, field, and research productivity from salaries and then focus on the remaining pay differences by gender and race. The analysis begins with the specification of a salary equation of the form:

$$(2) \qquad \ln Y_i = \alpha_0 + \sum_{j=1}^{J} \alpha_j X_{ij} + \varepsilon_i$$

where $\ln Y_i$ = salary for the *i*-th faculty member expressed in logarithms, X_1 to X_J = set of J independent variables that were deemed appropriate for differentiating salaries among faculty, α_0 to α_J = set of coefficients to be estimated by multiple regression analysis, and ε_i = random error term. The log of salary is most often used as the dependent variable in salary equity studies due to its appropriateness in situations where salaries reflect a compounding process (i.e., salary increases are normally awarded to workers on a percentage basis as opposed to a fixed dollar amount). The resulting coefficients in the salary model are then interpreted as (approximate) percentage changes in salary due to a one-unit change in each of the designated factors X_1 to X_J.

To measure the unexplained wage gap between male and female faculty or between

underrepresented race/ethnicity and non-underrepresented faculty, either a single-equation method or a two-equation method can be used. In the single-equation method, a dummy variable for each faculty member's gender and race are added to the wage equation shown above:

$$(3) \qquad \ln Y_i = \alpha_0 + \sum_{j=1}^{J} \alpha_j X_{ij} + \alpha_{J+1} F_i + \alpha_{J+2} M_i + \varepsilon_i$$

where the variable $F_i = 1$ if female, 0 otherwise, and $M_i = 1$ if underrepresented race/ethnicity, 0 otherwise. Even though faculty members can fall into multiple race/ethnicities, due to the small numbers of faculty in specific racial categories such as Black or Hispanic researchers must usually combine all non-white and non-Asian faculty into one aggregate group for the purpose of statistical analysis. In this single-equation salary model, the coefficient α_{J+1} represents the unexplained wage gap for gender, or the percentage salary difference between male and female faculty after taking into account differences in the levels of the independent variables for males and females. Likewise, the coefficient α_{J+2} represents the unexplained wage gap for race, or the percentage salary difference between underrepresented and non-underrepresented faculty after taking into account differences in the levels of the independent variables.

One limitation of the single-equation approach, however, is that it restricts each of the independent variables in the model to have the same effect on salary for both male and female faculty or for underrepresented and non-underrepresented faculty. For example, if one of the independent variables in the salary model is years of experience, then this restriction means that an additional year in the labor force must have the same average impact on salary for men and women. If these assumptions are inappropriate, then the estimated coefficient for the gender

(and race) variable – the unexplained wage gap – may also be incorrect. The extent to which the unexplained wage gap is affected by these restrictions will vary from application to application, although in practice researchers have found the differences to be fairly minor.

To address this issue, Oaxaca (1973), Blinder (1973), Reimers (1983), Cotton (1988) and others recommend using multiple-equation methods for measuring the unexplained wage gap. Rather than adding a dummy variable to the wage equation for gender or race, the two-equation methods suggest estimating the wage equation (2) separately for the majority group of interest. For example, in the case of gender the researcher might estimate the salary model for males only:

$$(4) \qquad \ln Y_i = \alpha_{m0} + \sum_{j=1}^{J} \alpha_{mj} X_{mij} + \varepsilon_i, \quad \textit{for male faculty only}$$

Equation (4) is referred to as the male wage structure.1 The unexplained wage gap between the genders can then be found by substituting each female faculty member's characteristics into the male-only salary model and comparing the average actual female salary with the average predicted salary as if male:

$$(5) \qquad \text{Unexplained Wage Gap (2-equation)} = \ln \bar{Y}(\textit{female}) - \ln \bar{\hat{Y}}(\textit{female as male})$$

where $\ln \bar{\hat{Y}}(\textit{female as male})$ = average predicted log of salary for females based on the male wage structure, and $\ln \bar{Y}(\textit{female})$ = average log of salary for female faculty. If the resulting quantity in equation (5) is negative, then it suggests that on average female faculty are paid less

1 This approach requires having a sufficient number of observations on each variable by gender or race. See Toutkoushian and Hoffman (2002) for more discussion of the challenges in implementing the two-equation method in institution studies of internal salary equity.

than what would be predicted from the all-male salary model. The same approach can be used for race/ethnicity by first estimating the salary model for only faculty in non-underrepresented race/ethnicity categories, and then determining whether the average salary for underrepresented faculty exceeds what would be predicted for them based on the non-underrepresented race/ethnicity salary model.

A second issue to address when conducting a salary equity study is whether or not to control for academic rank in the salary model. Because faculty members usually receive pay increases when they are promoted, and promotion is tied to job performance, there is a clear connection between salary and rank that argues for the researcher to add variables for rank to the salary model. If this is true and male/non-underrepresented faculty are more likely than female/underrepresented faculty to be found at higher ranks, then failure to control for rank will lead to an overestimate of the unexplained wage gap. However, some researchers have argued that if female/underrepresented faculty members are discriminated against in terms of rank assignment, then controlling for rank in the salary model will lead to an underestimate of the true unexplained wage gap. The approach favored by many researchers to this problem is to estimate the unexplained wage gap both ways, report both sets of findings, and then compare the estimates to see whether the magnitude of the unexplained wage gap changes.

Finally, researchers also have to address the appropriate level of aggregation for conducting a salary equity study. Most salary equity studies examine the faculty as a whole for the institution, and adjust for salary differences within the institution through the use of dummy variables for academic departments and/or collegiate units. Depending on the size of the institution, it may also be possible to conduct analyses of salary equity for subsets of the

institution provided that there are enough faculty members in the subsets to reliably estimate the salary model. Most salary equity studies further restrict their analyses to full-time, tenured and tenure-eligible faculty because the nature of the work and compensation for these faculty members is substantially different from that for non-tenure-eligible faculty members.

Data Description

The dataset used in this report consists of faculty members at the University of Missouri in the 2014-15 academic year. The data were obtained from the office of Institutional Research at the University of Missouri.[2] To ensure that the set of faculty was relatively homogeneous and that the analysis conducted here was comparable to accepted practices and standards in the field, only faculty members who were employed full-time in tenured or tenure-track positions at the Full, Associate, or Assistant Professor ranks were included in the study. Consistent with most other studies of salary equity, faculty in the School of Medicine were excluded from the analysis.[3]

From the database for the University of Missouri, the following independent variables were constructed:

- Years employed by the University of Missouri
- Years within current rank (and years within rank squared)
- Age

[2] I am extremely grateful to Mardy Eimers and Kathy Felts in Institutional Research for assembling the dataset used in this study.

[3] Medical faculty are usually excluded from salary equity studies because the level and nature of their compensation is different from most other tenured and tenure-eligible faculty in higher education. Medical faculty often receive substantial compensation from their clinical practices, and their base salaries may be adjusted accordingly.

- Highest degree (doctorate vs. non-doctorate)
- Academic rank (Full, Associate, Assistant)
- Gender
- Underrepresented race (non-white and non-Asian)
- Whether the individual holds a named professorship
- Whether the individual is a curator professor
- Whether the individual holds an administrative position
- Research productivity z-score
- Department/collegiate affiliation (64 categories)

The research productivity measure was developed by the company Academic Analytics. The research productivity score for any particular year is derived from a composite of the following research quantities: (1) number of journal articles from the previous four years; (2) number of books from the previous ten years; (3) number of citations from the previous five years; (4) number of conference proceedings from the previous four years; and (5) number of grants and grant dollars received from the previous five years. Academic Analytics used these data to compute an aggregate research productivity score for each faculty member. To take into account the different forms of productivity across fields, the productivity score was converted into a z-score representing each faculty member's productivity relative to others in the same field. For example, a professor in sociology with a z-score of +1.00 would mean that the person's total research productivity score is one standard deviation above the average for his/her field. The research productivity z-scores that I used in the salary models were based on the average z-scores for the years 2012-13 and 2013-14 for those faculty who were here in both

years. The z-scores for faculty members who were only here in 2013-14 were set equal to their 2013-14 z-scores. One limitation of this measure, however, is that it excludes newly-hired faculty in 2014-15 and does not include faculty in the Department of Health Sciences and the School of Law. As a result, these faculty members were not included in the subsequent salary models.

The dummy variables for departmental/ collegiate affiliation were constructed from the faculty member's home department at the University of Missouri. When there were fewer than four faculty members in a given department, faculty were aggregated into dummy variables at the collegiate level. A list of the departmental/college variables used in this study is provided in the Appendix. After excluding faculty members with missing data on the variables used in the statistical analysis, there were a total of 966 faculty members in the dataset.

Findings -- Unexplained Wage Gap by Gender and Race

Table 4 provides descriptive statistics (mean and standard deviation) for the key variables that are used in the faculty salary models, broken down by gender.

Table 4: Descriptive Statistics for Selected Variables by Gender, 2014-15

Variable	Males Only	Females Only	Combined
Annual Salary	$105,219	$89,389	$100,188
Log of Annual Salary	11.502	11.351	11.454
Highest Degree Doctorate	96%	94%	95%
Full Professor	52%	35%	47%
Associate Professor	33%	40%	36%
Assistant Professor	15%	25%	18%
Curator Professor	5%	4%	5%
Named Professor	15%	8%	13%
Age	52.5	49.8	51.7
Years at MU	16.6	13.0	15.5
Years in Current Rank	9.6	6.0	8.5
Research Productivity Z-score	0.045	0.004	0.033
Number of Faculty	659	307	966

Table 4 shows that the average salary for female faculty is almost $16,000 (or 15%) below the average salary for male faculty. This total wage gap was smaller than what was found earlier for all public doctoral institutions (Table 1). Not surprisingly, the descriptive statistics suggest that some portion of this total wage gap was likely attributable to differences in personal and work-related differences across genders. On average, male faculty members had 3 ½ additional years of experience at the University than do females, males were more likely than females to be at the Full Professor level, and males had higher research productivity z-scores than did females. In addition, what is not shown in Table 4 is that the faculty in the departments

and colleges with the highest average salaries were predominantly male.

Similarly, Table 5 provides a breakdown of means for these variables by racial status:

Table 5: Descriptive Statistics for Selected Variables by Race/Ethnicity, 2014-15

Variable	Non-Underrepresented Race/Ethnicity Only	Underrepresented Race/Ethnicity Only	Combined
Annual Salary	$101,390	$85,483	$100,188
Log of Annual Salary	11.465	11.319	11.454
Highest Degree Doctorate	95%	96%	95%
Full Professor	48%	30%	47%
Associate Professor	35%	40%	36%
Assistant Professor	17%	30%	18%
Curator Professor	5%	0%	5%
Named Professor	14%	5%	13%
Age	51.8	49.9	51.7
Years at MU	15.8	12.0	15.5
Years in Current Rank	8.6	6.7	8.5
Research Productivity Z-score	0.043	-0.096	0.033
Number of Faculty	893	73	966

As with gender, the descriptive statistics in Table 5 reveal a number of important differences with regard to race/ethnicity among faculty at the University of Missouri. The average salary for faculty in underrepresented race/ethnicity categories is nearly $16,000 (or 15%) below the average for non-underrepresented faculty. Likewise, underrepresented race/ethnicity faculty were less likely that their colleagues to hold higher-paid ranks (Full Professor, Curator Professor, or named professorships) and had several fewer years of experience. All of these factors may have contributed to the large average pay gap by race/ethnicity shown in Table 5.

To determine if female faculty/underrepresented race faculty at the University of Missouri were paid significantly less than their male/non-underrepresented counterparts after controlling for differences in salary that were due to factors that are measurable and should

legitimately affect pay, I estimated two different multiple regression models. In each model, the dependent variable was the natural log of annual salary. In the first model, I controlled for the following factors: gender, underrepresented race/ethnicity, whether PhD, age, years in current rank and years in rank squared, other years of experience at MU, whether administrative experience, department, and research productivity z-score. In the second model, I added control variables for the faculty member's current academic rank (Full, Associate, Curator, Named) to determine whether adding academic rank to the model accounted for more of the total wage gap.

For each model, I conducted a test to determine if there was evidence of heteroscedasticity. If heteroscedasticity was present, then the assumption of a constant variance for the error term would be violated. As a result, the standard errors for the coefficients in the model (and also the t-ratios and significance levels) would be incorrect. From the test, I was able to determine that there was in fact heteroscedasticity in the regression model. To correct the problem, I reestimated the regression models using the robust regression feature in Stata, which relies on the procedure developed by White (1980) to obtain consistent estimates of the standard errors for the coefficients. The results for all of the variables except the departmental/college variables after making the heteroscedasticity corrections are shown in Table 6.

Table 6: Multiple Regression Results for Determinants of Salary for Faculty at the University of Missouri, 2014-15

Variable	Without Controls for Rank	With Controls for Rank
Female	-0.014 (0.013)	-0.015 (0.010)
Underrepresented Race/Ethnicity	-0.0003 (0.022)	0.012 (0.017)
Non PhD	-0.028 (0.033)	-0.012 (0.026)
Age	0.006*** (0.001)	-0.0007 (0.0008)
Years in Current Rank	0.013*** (0.002)	0.011*** (0.002)
Other Years MU Experience	-0.002 (0.001)	-0.007*** (0.001)
Administrative Experience	0.158*** (0.018)	0.117*** (0.014)
Research Productivity Z-Score	0.115*** (0.007)	0.077*** (0.006)
Curator Professor	-----	0.085*** (0.028)
Named Professor	-----	0.163*** (0.019)
Full Professor	-----	0.299*** (0.025)
Associate Professor	-----	0.063*** (0.019)
Constant	10.889*** (0.064)	11.170*** (0.053)
R-Squared	0.76	0.83
F-statistic	40.01***	66.89***
Heteroscedasticity Test ($\chi^2(1)$)	37.38***	58.34***

Notes: Dependent variable = log of annual salary. Standard errors are shown in parentheses. Coefficients represent the approximate percentage change in salary due to a one-unit change in each independent variable. Each model also includes a variable for years in current rank squared and 62 dichotomous variables for departmental affiliation (reference category = School of Health Professions). ***significant at 0.1% level. **significant at 1% level. *significant at 5% level (two-tailed tests). Breusch-Pagan / Cook-Weisberg test for heteroscedasticity. All results have been corrected for heteroscedasticity.

The salary models in Table 6 show that a large proportion (the R-squared statistic is between 76 percent and 83 percent) of the variations in faculty salaries was explained by factors

such as their rank, labor market experience, research productivity, and academic discipline. These values are consistent with the R-squared values typically observed in internal salary equity studies conducted at single institutions. Not surprisingly, years of experience was found to have a positive and significant effect on faculty salaries when rank is not included in the model. The effect of experience on salary changed when rank was added to the model because of the high correlation between years of experience and academic rank. The results demonstrate that adding rank to the salary model improved the overall fit of the regression line and verified that salary increased with rank even after controlling for years of experience.

Turning to the main question at hand, it can be seen that although the estimated coefficients for the variable *Female* were negative across the three salary models, they were not statistically different from zero at even the 5% level regardless of whether rank was controlled for in the model. Likewise, the estimated coefficient for the variable *Underrepresented Race/Ethnicity* was not statistically different from zero in either model. Taken together, I conclude that there is no evidence that female or underrepresented race/ethnicity faculty at the University of Missouri were on average paid less than comparable male or non-underrepresented faculty, and that the results were not materially affected by whether rank was included in the salary model.

As a test of the robustness of the results, I applied the two-equation approach to measuring the unexplained wage gap between male and female faculty and between underrepresented and non-underrepresented faculty. Specifically, for gender I estimated both salary models for only the male faculty at the University of Missouri, computed the predicted salary for each female faculty member using this model, and then calculated the difference

between their average log of salary and their average log of predicted salary if paid as males. If the difference was found to be dramatically different from what was obtained in the single-equation method, then the restrictions imposed by the single-equation method could be leading to incorrect estimates of the unexplained wage gap. I applied the same procedure with regard to race/ethnicity by estimating the salary model for all non-underrepresented faculty and then calculating the average pay gap for underrepresented faculty. Table 7 provides a summary of the results from the two-equation approaches:

Table 7: Unexplained Wage Gaps at the University of Missouri: Two-Equation Method

	Gender		Underrepresented Race/Ethnicity	
Statistic	**Without Rank**	**With Rank**	**Without Rank**	**With Rank**
Coefficient	-0.007	-0.003	+0.026	+0.035
Standard Error	0.010	0.008	0.022	0.017
T-Ratio	-0.68	-0.41	+1.18	+2.06*

Notes: Each method used the regression model specification shown in Table 6. *Significant at 5% level.

Table 7 illustrates that the unexplained wage gaps were not materially affected by whether the single-equation or two-equation approach was used. Regardless of the method, almost all of the total wage gap between men and women was accounted for by factors that should legitimately affect salaries. Likewise, there was no evidence in the two-equation model that faculty in underrepresented race/ethnicity categories were paid less than comparable non-underrepresented faculty. In fact, in the salary model controlling for rank I found that on average the actual salaries for faculty in underrepresented race/ethnicity categories were higher than predicted and statistically significant at the 5% level. Therefore the conclusions drawn from the single-equation method are appropriate for this study.

Salary Equity by College and Division

The findings in the previous section apply to the University of Missouri faculty as a whole. In these models, differences in faculty pay by field were captured by the coefficients for the dummy variables for academic department/college. This approach by definition restricts the salary determination process to be the same across academic units, except for intercept (average) differences in pay. It is possible, however, that the level of pay disparity by gender and race/ethnicity differs depending on the faculty member's academic unit. For example, the pay disparity between male and female faculty in the sciences may be larger or smaller than the gender pay disparity in the humanities. Unfortunately, there are too few faculty members within individual academic departments to estimate separate salary models for each discipline. The best that can be done is to estimate the salary model for select groups of departments where there are a sufficient number of faculty (generally more than 100) and the faculty are arguably similar to each other in aspects of their work.

In this study, I conducted two such analyses. First, I estimated the salary model for each collegiate unit at the University of Missouri having more than 100 faculty members. For the dataset used in this study, these colleges were the College of Arts and Sciences (n=447), the College of Agriculture, Food and Natural Resources (n=143), and the College of Engineering (n=104). Table 8 shows the results from the separate salary models for these three colleges. Due to the relatively small sample size by college, I only used the single-equation approach in each instance. Each model still contained dummy variables for the academic departments within the college to capture average pay differences by department.

Table 8: Multiple Regression Results for Determinants of Salary for Faculty at the University of Missouri, 2014-15 – by College

Variable	College of Arts and Sciences	College of Agriculture, Food and Natural Resources	College of Engineering
Female	-0.0145 (0.013)	0.0082 (0.040)	-0.0362 (0.048)
Underrepresented Race/Ethnicity	0.0213 (0.021)	0.0531 (0.078)	-0.1994* (0.080)
Age	-0.0006 (0.001)	0.0035 (0.003)	-0.0039 (0.003)
Years in Current Rank	0.0128*** (0.003)	-0.0047 (0.007)	0.0045 (0.006)
Other Years MU Experience	-0.0105*** (0.001)	-0.0123*** (0.003)	-0.0048 (0.003)
Administrative Experience	0.0840*** (0.019)	0.1920*** (0.053)	0.1527*** (0.045)
Research Productivity Z-Score	0.0696*** (0.008)	0.1136*** (0.020)	0.0549** (0.017)
Curator Professor	-0.0569 (0.043)	0.1114 (0.099)	n/a
Named Professor	0.2347*** (0.038)	0.2431*** (0.060)	0.1607*** (0.037)
Full Professor	0.3179*** (0.035)	0.3704*** (0.091)	0.2924*** (0.081)
Associate Professor	0.0584* (0.025)	0.2165** (0.080)	0.0983 (0.075)
Constant	11.1527*** (0.066)	10.8014*** (0.141)	11.6212*** (0.118)
R-Squared	0.87	0.78	0.78
Number of Faculty	447	143	104

Notes: Dependent variable = log of annual salary. Standard errors are shown in parentheses. Coefficients represent the approximate percentage change in salary due to a one-unit change in each independent variable. Each model also includes a variable for years in current rank squared, highest degree, and dichotomous variables for departmental affiliation within each collegiate unit. n/a = not applicable to this collegiate unit. ***significant at 0.1% level. **significant at 1% level. *significant at 5% level (two-tailed tests).

Overall, the fit of the salary models presented in Table 8 is comparable to what was found when the salary model was estimated for the university as a whole. The variables for personal and work-related characteristics accounted for 78% to 87% of the variations in salaries within colleges. Likewise, key independent variables such as academic rank, administrative experience, and research productivity were found to have a positive and statistically significant impact on faculty salaries across the three collegiate units examined here. Turning to the variables of focus for this study, I found that after controlling for the effects of other personal and work-related characteristics on pay, the salaries of female faculty in these three colleges at the University of Missouri were not significantly different from the salaries of male faculty.

With regard to race/ethnicity, I likewise found no evidence of an unexplained pay disparity between underrepresented and non-underrepresented faculty in the College of Arts and Sciences or the College of Agriculture, Food and Natural Resources. However, the salary model for all faculty in the College of Engineering (third column) revealed that there was an approximate 20% average pay disparity for underrepresented faculty that was statistically significant at the 5% level.

The second method that I used to examine pay equity by subfield was to estimate the salary model for each academic division or combinations of similar divisions having more than 100 faculty members. For the dataset used in this study, these divisions were Social Sciences (n=145), Sciences (n=190), and Arts and Humanities (n=182). The social science divisions consisted of faculty in either the Division of Social Sciences or the Division of Applied Social Sciences. The science divisions were comprised of the Division of Animal Sciences, the Division of Biochemistry (CAFNR), and the Division of Physics, Biology, and Math Sciences. Table 9

shows the results from the separate salary models for these three divisional groupings. As in the analysis by collegiate unit, due to the relatively small sample size by division only the single-equation approach was used in each instance to estimate the salary model and measure the pay disparities by gender and race/ethnicity.

Table 9: Multiple Regression Results for Determinants of Salary for Faculty at the University of Missouri, 2014-15 – by Academic Divisions

Variable	Social Sciences Divisions[1]	Science Divisions[2]	Division of Arts & Humanities
Female	-0.0247 (0.032)	-0.0188 (0.026)	-0.0142 (0.016)
Minority	0.1012* (0.048)	-0.0622 (0.051)	0.0304 (0.026)
Age	0.0013 (0.003)	0.0029 (0.002)	-0.0020 (0.001)
Years in Current Rank	0.0045 (0.007)	0.0137** (0.005)	0.0111** (0.004)
Other Years MU Experience	-0.0097** (0.003)	-0.0142*** (0.002)	-0.0094*** (0.002)
Administrative Experience	0.0974* (0.047)	0.0573 (0.038)	0.1014*** (0.024)
Research Productivity Z-Score	0.0913*** (0.020)	0.1079*** (0.013)	0.0341** (0.012)
Curator Professor	-0.1084 (0.082)	0.0293 (0.065)	-0.1062 (0.067)
Named Professor	0.2360*** (0.062)	0.1644** (0.061)	0.2088*** (0.054)
Full Professor	0.3031*** (0.077)	0.2997*** (0.056)	0.4163*** (0.050)
Associate Professor	0.0887 (0.061)	0.0823 (0.047)	0.1012** (0.035)
Constant	11.1084*** (0.118)	11.0067*** (0.087)	11.1610*** (0.071)
R-Squared	0.85	0.81	0.81
Number of Faculty	145	190	182

Notes: Dependent variable = log of annual salary. Standard errors are shown in parentheses. Coefficients represent the approximate percentage change in salary due to a one-unit change in each independent variable. Each model also includes a variable for years in current rank squared, highest degree, and dichotomous variables for departmental affiliation within each division. n/a = not applicable to this division. [1] Includes Division of Social Sciences and Division of Applied Social Sciences. [2]Includes Division of Animal Sciences, Division of Biochemistry (CAFNR), and Division of Physics, Biology, and Math Sciences. ***significant at 0.1% level. **significant at 1% level. *significant at 5% level (two-tailed tests).

As with the analysis by collegiate unit, the three division-specific salary models explained between 81% and 85% of the variations in faculty salaries, which is consistent with the fit of the salary models for the University of Missouri as a whole. Similarly, the variables for academic rank, administrative experience, and research productivity were generally statistically significant. With regard to gender and race, the models showed that after controlling for the other personal and work-related factors in the model, there was no evidence that female faculty were paid less than comparable male faculty, nor that underrepresented race/ethnicity faculty were paid less than comparable non-underrepresented faculty. The only instance of a statistically significant pay difference by race (at the 5% level) was for the social sciences division, and in this instance the pay disparity favored underrepresented faculty.

Salary Compression at the University of Missouri

In this section of the report, I examined whether there was evidence of overall salary compression at the University of Missouri. Salary compression in its most general form is said to occur when the salary differential between less experienced ("junior") and more experienced ("senior") faculty members is deemed to be too small. One way to start looking at the issue is to compare average faculty salaries by rank. In this dataset for the University of Missouri, the average salary for assistant professors ($76,877) is 92% of the average for associate professors ($83,247) and 63% of the average for full professors ($121,963). Average salary ratios by group are not sufficient to determine whether the salaries for junior faculty members are unusually high. It is possible, for example, that the average salary ratio of 92% between assistant and associate professors is higher or lower than would be warranted given the relative qualifications of faculty in each group that should affect salaries. Another way to look at the problem is that a standard is needed by which to determine if the current ratios of average salaries are too high or too low.

To address this issue, I developed a five-step procedure to determine whether there is evidence of a statistically-significant pay difference between faculty members with different levels of experience.4 The five steps are as follows:

1. Specify a salary model in which the variables are chosen that should have an effect on a faculty member's salary;

4 Toutkoushian, R. (1998). Using regression analysis to determine if faculty salaries are overly compressed. *Research in Higher Education, 39*, 87-100.

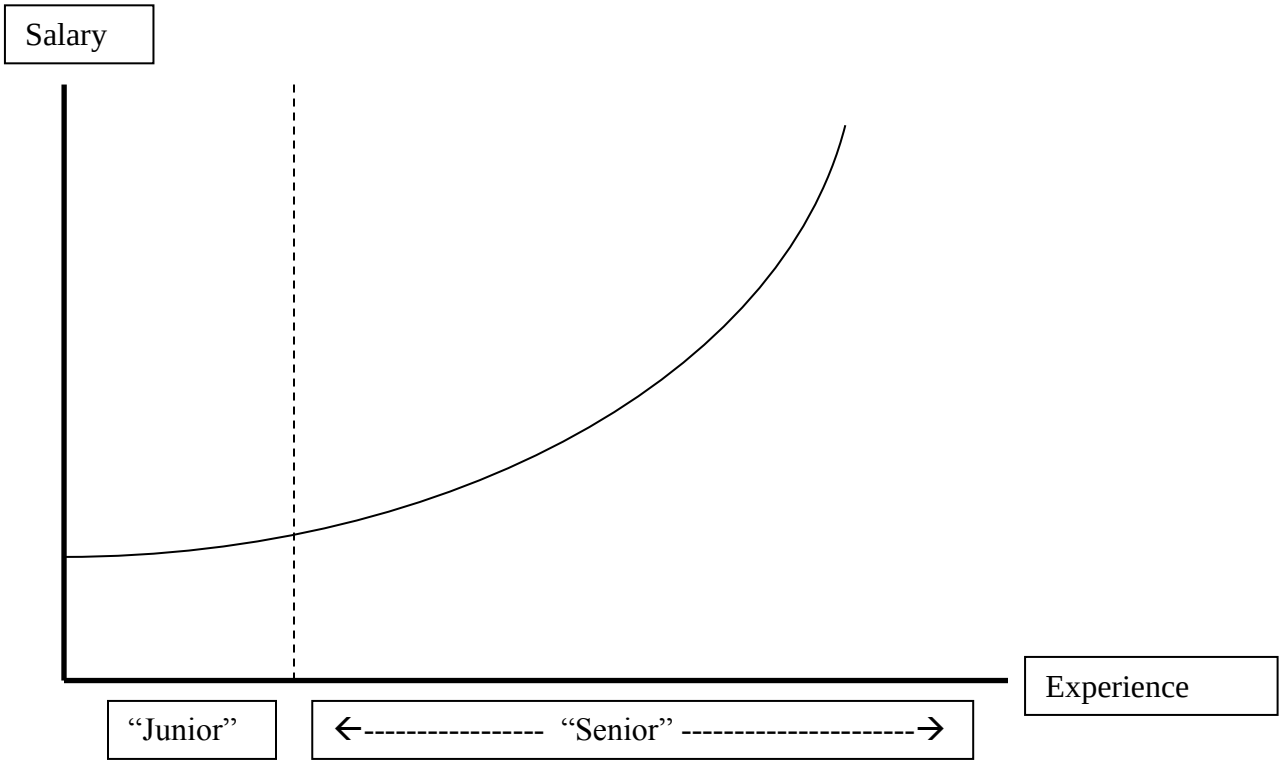
2. Group faculty into two categories: "junior" and "senior" faculty. The two groups should only include those faculty members who have spent their academic careers at the University of Missouri;
3. Estimate the parameters in the salary model for only the set of senior faculty;
4. Find the average predicted salaries for junior faculty members based on the results from the salary model for senior faculty;
5. Calculate the difference between the average salary for junior faculty and the average predicted salary for junior faculty based on the senior salary model, and determine if this average residual is statistically different from zero.

The way in which this procedure works is depicted in Figure 1. The curve to the right of the dashed line shows the predicted relationship between experience and salary for senior faculty, after controlling for other factors in the salary model. The curve is extrapolated to the left of the dashed line, and represents the average predicted salary for junior faculty if they were paid in the same way as senior faculty with less experience. If the average actual salary for junior faculty exceeds their average predicted salary, then they will fall above the curve in Figure 1. To determine if the residual is statistically significant, a standard one-sample t-test can be used:

$$t = \frac{\ln \bar{Y} - \ln \hat{\bar{Y}}}{\hat{\sigma}_e / \sqrt{n}} \tag{6}$$

where the numerator represents the residual or difference between the average actual and predicted salaries for junior faculty members, n = number of junior faculty, σ_e = estimated standard deviation of the residual, and n-1 degrees of freedom.

Figure 1: Graphical relationship between Experience and Salaries for Senior Faculty



For Step 1, I used the second salary model developed in the first part of this report (see Table 6) where I controlled for faculty rank. Turning to Step 2, I isolated the subset of faculty members from the first part of the study who the data suggest had spent their academic careers at the University of Missouri (n=738). This was done by selecting only those faculty members who were not initially hired by the University of Missouri at the rank of assistant professor.[5]

[5] For this test, it is necessary to omit faculty members who have spent time at other institutions because their salary/experience profiles will likely be different from those faculty members who have been employed at the University of Missouri for their entire careers. The personnel data from the University of Missouri did not contain information on years of previous employment, and thus some of the faculty who were hired at the assistant rank may also have academic experience at other institutions. However, the prior years of experience likely had a small effect on their salary given their initial rank of hire.

To differentiate between "junior" and "senior" faculty members, a decision must be made as to how many years to use for the cutoff. The number of years cannot be too small or there will not be enough individuals in the junior faculty group to conduct a statistically reliable measurement. At the same time, having too large of a cutoff value reduces the distinction between junior and senior faculty members. Accordingly, I used four different cutoff values for defining junior faculty: (1) two years (n=47), (2) three or fewer years (n=83), (3) four or fewer years (n=103), or (4) five or fewer years (n=123). All other faculty were classified as "senior faculty." It should be noted, however, that newly-hired junior faculty in 2014-15 were not included in the analysis due to having missing data on the research productivity measure developed by Academic Analytics. Faculty in the Finance department were also excluded from the salary compression analysis because there were not enough senior faculty in the department to estimate the coefficient for the department.

Findings – Salary Compression

Table 10 summarizes the findings for junior faculty members when they were substituted into the equation shown in Table 6.

Table 10: Statistics for Junior Faculty Members at the University of Missouri, 2014-15

Statistic	Two Years	Three Years or Fewer	Four Years or Fewer	Five Years or Fewer
Average log of salary (A)	11.2603	11.1967	11.2369	11.2258
Average log of predicted salary (B)	11.2558	11.2129	11.2359	11.1987
Average residual (C = A-B)	+0.0045	-0.0162	+0.0010	+0.0271
Standard error (D)	0.0159	0.0109	0.0117	0.0105
Calculated t-ratio (E = C/D)	+0.29	-1.48	+0.09	+2.58**
Number of junior faculty	47	83	103	123

Notes: *** significant at 0.001 level. ** significant at 0.01 level. * significant at 0.05 level (two-tailed tests)

The data show that across the first three definitions of junior faculty, the average salaries for junior faculty were comparable to what would be predicted for senior faculty. In the first column, for example, when junior faculty was defined as those having two years of experience, their average salary was 0.4% higher than their predicted salary from the senior model, and was not close to being statistically significant. In the next column, junior faculty with three years or less experience were paid slightly less (1.6%) than predicted, but the difference was not statistically significant. The only instance where the pay disparity was significant was when faculty with five years of experience were added to the group of junior faculty. In this instance, the average pay disparity in favor of junior faculty was 2.7%, and was statistically significant at the 1% level.

After further investigation, it was discovered that the appearance of salary compression in the last model was concentrated in the Trulaske College of Business. Rerunning the last salary model after excluding faculty in the College of Business reduced the pay advantage for junior faculty to 1.1%, which was statistically insignificant (t=1.15). As a result, it appears as though there has not been a consistent boost in salaries for all junior faculty at the University of Missouri, and that possible concerns with salary compression are isolated in the Trulaske School of Business.

Conclusions

In this study, I investigated whether there was any evidence that faculty members, on average, face pay discrimination at the University of Missouri based on gender and race, and whether faculty salaries are overly compressed between junior and senior faculty members. With regard to gender equity, I found that after controlling for the effects of academic experience, rank, departmental affiliation, research productivity, and type of position, the unexplained wage gap by gender varied between -1.4% and -1.5% and was statistically insignificant. Likewise, there was no evidence of a systematic pay bias against faculty in underrepresented race/ethnicity categories relative to comparable non-underrepresented faculty. However, the disaggregated analyses did reveal that there was a negative and marginally significant (5% level) pay disparity for underrepresented faculty in the College of Engineering. Finally, turning to salary compression, I found that for three of the four definitions of junior faculty used in this report, their salaries were not significantly greater than what would be predicted for their more senior colleagues. Subsequent analyses revealed that the salary compression problem in the last model is isolated to faculty in the College of Business.

Recommendations

The following recommendations are made based on the results from my analysis:

1. The University should conduct a more detailed review of the salaries and qualifications of faculty members in the College of Engineering who are in underrepresented race/ethnicity groups to determine if their salaries are unusually low relative to their peers.
2. The University should conduct a more detailed review of the salaries and qualifications of the senior faculty members in the Trulaske College of Business to determine if adjustments are warranted in response to concerns over salary compression.
3. A procedure should be implemented by the University of Missouri to review salary equity on a periodic basis, such as every five years. This would involve assembling a dataset similar to what was used in this study and reestimating the salary models used in this study.

Selected Studies and Readings on Faculty Pay Discrimination

Ashraf, J. "The Influence of Gender on Faculty Salaries in the United States, 1969-89." *Applied Economics*, 1996, 28(7), 857-864.

Balzer, W., Boudreau, N., Hutchinson, P., Ryan, A., Thorsteinson, T., Sullivan, J., Yonker, R., and Snavely, D. "Critical Modeling Principles When Testing for Gender Equity in Faculty Salaries." *Research in Higher Education*, 1996, *37* (6), 633-658.

Barbezat, D. "Salary Differentials or Sex Discrimination? Evidence from the Academic Labor Market." *Population Research and Policy Review*, 1987, 6, 69-84.

Barbezat, D. "Affirmative Action in Higher Education: Have Two Decades Altered Salary Differentials by Sex and Race?" *Research in Labor Economics*, 1989, *10*, 107-156.

Barbezat, D. "Updating Estimates of Male-Female Salary Differentials in the Academic Labor Market." *Economics Letters*, 1991, *36*(2), 191-195.

Barbezat, D., and Donihue, M. "Do Faculty Salaries Rise with Job Seniority?" *Economics Letters*, 1998, 58(2), 239-244.

Barbezat, D. "History of Pay Equity Studies." In R. Toutkoushian (ed.), *Conducting Salary-Equity Studies: Alternative Approaches to Research*. New Directions for Institutional Research, 2002, 115, pp. 9-40.

Becker, W., and Goodman, R. "The Semilogarithmic Earnings Equation and its Use in Assessing Salary Discrimination in Academe." *Economics of Education Review*, 1991, *10*, 323-333.

Becker, W., and Toutkoushian, R. "The Measurement and Cost of Removing Unexplained Gender Differences in Faculty Salaries." *Economics of Education Review*, 1995, *14*, 209-220.

Bellas, M. "Faculty Salaries: Still a Cost of Being Female?" *Social Science Quarterly*, 1993, 74(1), 62-75.

Blinder, A. "Wage Discrimination: Reduced Form and Structural Estimates." *Journal of Human Resources*, 1973, 8, 436-455.

Boudreau, N., Sullivan, J., Balzer, W., Ryan, A., Yonker, R., Thorsteinson, T., and Hutchinson, P. "Should Faculty Rank be Included as a Predictor Variable in Studies of Gender Equity in University Faculty Salaries?" *Research in Higher Education*, 1997, *38* (3), 297-312.

Cotton, J. "On the Decomposition of Wage Differentials." *Review of Economics and Statistics*, 1988, 70(2), 236-243.

Eckes, S., & Toutkoushian, R. "Legal Issues and Statistical Approaches to Reverse Pay Discrimination in Higher Education." *Research in Higher Education*, 2006, *47*, 957-984.

Ervin, D., Thomas, B., and Zey-Ferrell, M. "Sex Discrimination and Rewards in a Public Comprehensive University." *Human Relations*, 1984, *37*, 1005-1025.

Ferber, M. "Professors, Performance, and Rewards." *Industrial Relations*, 1974, *13* (1), 69-77.

Ferber, M., Loeb, J., and Lowry, H. "The Economic Status of Women Faculty: A Reappraisal." *Journal of Human Resources*, 1978, *13* (3), 385-401.

Ferber, M., and Loeb, J. "Issues in Conducting an Institutional Salary-Equity Study." In R. Toutkoushian (ed.), *Conducting Salary-Equity Studies: Alternative Approaches to Research*. New Directions for Institutional Research, 2002, 115, pp. 41-70.

Gordon, N., Morton, T., and Braden, I. "Faculty Salaries: Is There Discrimination by Sex, Race, and Discipline?" *American Economic Review*, 1974, *64* (2), 419-427.

Hallock, K. "Seniority and Monopsony in the Academic Labor Market: Comment." *American Economic Review*, 1995, *85* (3), 654-657.

Hirsch, B., and Leppel, K. "Sex Discrimination in Faculty Salaries: Evidence from a Historically Women's University." *American Economic Review*, 1982, *72* (September), 829-835.

Hoffman, E. "Faculty Salaries: Is There Discrimination by Sex, Race, and Discipline? Additional Evidence." *American Economic Review*, 1976, *66* (1), 196-198.

Johnson, G., and Stafford, F. "The Earnings and Promotion of Women Faculty." *American Economic Review*, 1974, 64, 888-903.

Koch, J., and Chizmar, J. "Sex Discrimination and Affirmative Action in Faculty Salaries," *Economic Inquiry*, 1976, *14*, 16-24.

McNabb, R., and Wass, V. "Male-Female Salary Differentials in British Universities." *Oxford Economic Papers*, 1997, *49* (3), 328-343.

Megdal, S., and Ransom, M. "Longitudinal Changes in Salary at a Large Public University: What Response to Equal Pay Legislation?" *American Economic Review*, 1985, *75* (2), 271-274.

Mincer, J. *Schooling, Experience, and Earnings*. New York and London: Columbia University Press, 1974.

Oaxaca, R. "Male-Female Wage Differentials in Urban Labor Markets." *International Economic Review*, 1973, 14(3), 693-709.

Perna, L. "Sex Differences in Faculty Salaries: A Cohort Analysis." *Review of Higher Education*, 2001, 24(3), 283-307.

Porter, S., Toutkoushian, R., & Moore, J. (in press). "Pay Inequities for Recently-Hired Faculty, 1988-2004." Forthcoming, *Review of Higher Education*.

Ransom, M. "Seniority and Monopsony in the Academic Labor Market." *American Economic Review*, 1993, *83* (1), 221-233.

Ransom, M., and Megdal, S. "Sex Differences in the Academic Labor Market in the Affirmative Action Era." *Economics of Education Review*, 1993, 12, 21-43.

Raymond, R., Sesnowitz, M., and Williams, D. "Does Sex Still Matter? New Evidence from the 1980s." *Economic Inquiry*, 1988, *26* (1), 43-58.

Raymond, R., Sesnowitz, M., and Williams, D. "The Contribution of Regression Analysis to the Elimination of Gender Based Wage Discrimination in Academia: A Simulation." *Economics of Education Review*, 1990, *9* (3), 197-207.

Riggs, M., Downey, R., McIntyre, P., and Hoyt, D. "Using Discriminant Analysis to Predict Faculty Rank." *Research in Higher Education*, 1986, *25* (4), 365-376.

Reimers, C. "Labor Market Discrimination against Hispanic and Black Men." *Review of Economics and Statistics*, 1983, 65(4), 570-579.

Smart, J. "Gender Equity in Academic Rank and Salary." *Review of Higher Education*, 1991, 14, 511-526.

Toutkoushian, R. "Issues in Choosing a Strategy for Achieving Salary Equity." *Research in Higher Education*, 1994, *35*, 415-428.

Toutkoushian, R. "Using Citation Counts for Measuring Sex Discrimination in Faculty Salaries." *The Review of Higher Education*, 1994, *18*, 61-82.

Toutkoushian, R. "Using Regression Analysis to Determine if Faculty Salaries are Overly Compressed." *Research in Higher Education*, 1998, *39*, 87-100.

Toutkoushian, R. "Sex Matters Less for Younger Faculty: Evidence of Disaggregate Pay Disparities from the 1988 and 1993 NCES Surveys." *Economics of Education Review*, 1998, 17(1), 55-71.

Toutkoushian, R. "Racial and Marital Status Differences in Faculty Pay." *The Journal of Higher Education*, 1998, *69*, 513-541.

Toutkoushian, R. "The Status of Academic Women in the 1990s: No Longer Outsiders, but Not Yet Equals." *The Quarterly Review of Economics and Finance*, 1999, 39, 679-698.

Toutkoushian, R. "Addressing Gender Equity in Nonfaculty Salaries." *Research in Higher Education*, 2000, *41*, 417-442.

Toutkoushian, R. (Ed.). *Conducting Salary-Equity Studies: Alternative Approaches to Research*. New Directions for Institutional Research, no. 115. San Francisco: Jossey-Bass, 2002.

Toutkoushian, R. (Ed.). *Unresolved Issues in Conducting Salary-Equity Studies*. New Directions for Institutional Research, no. 117. San Francisco: Jossey-Bass, 2003.

Toutkoushian, R., and Bellas, M. "The Effects of Part-Time Employment and Gender on Faculty Earnings and Satisfaction: Evidence from the NSOPF:93." *The Journal of Higher Education*, 2003, *74*, 172-195.

Toutkoushian, R., Bellas, M., & Moore, J. "The Interaction Effects of Gender, Race, and Marital Status on Faculty Salaries." *The Journal of Higher Education*, 2007, *78*, 572-601.

Toutkoushian, R., and Conley, V. "Progress for Women in Academe, but Inequities Persist: Evidence from NSOPF:99." *Research in Higher Education*, 2005, *46*, 1-28.

Toutkoushian, R., and Hoffman, E. "Alternatives for Measuring the Unexplained Wage Gap." In R. Toutkoushian (ed.), *Conducting Salary-Equity Studies: Alternative Approaches to Research*. New Directions for Institutional Research, no. 115, 2002, pp.71-89.

Weiler, W. "Integrating Rank Differences into a Model of Male-Female Faculty Salary Discrimination." *Quarterly Review of Economics and Business*, 1990, *30* (1), 3-15.

Statement of Qualifications

I am currently a Professor of Higher Education in the Institute of Higher Education at the University of Georgia. I teach courses and conduct research on a wide range of issues pertaining to the economics of education and financial issues of postsecondary education. Prior to joining the faculty at the University of Georgia, I served as a Coordinator/Research Associate in the Management Information Division at the University of Minnesota (1990-1996), the Executive Director of the Office of Policy Analysis for the University System of New Hampshire (1996–2003), and Professor of Educational Leadership at Indiana University. I have a Ph.D. in economics from Indiana University, where I specialized in econometrics and finance.

During the past twenty-five years, I have developed a particular expertise in the area of faculty/staff compensation. At the University of Minnesota, I utilized alternative methods for measuring faculty salary inequities and examined how to measure the impact of faculty productivity on salary differences in gender equity studies. Subsequently, I have conducted statistical studies of faculty gender equity using national data licensed through the National Center for Education Statistics. More recently I have completed gender equity studies for faculty and/or professional staff for Washburn University, the University of Minnesota, the University of Cincinnati, the University of New Hampshire, Villanova University, and Dartmouth College. My work on faculty compensation and work-related issues has been published in *Research in Higher Education*, *The Review of Higher Education*, *Economics of Education Review*, *The Journal of Higher Education*, and *Quarterly Review of Economics and Finance*. I have served as a consultant and/or expert witness for both the plaintiffs and the defendants in salary equity cases at the University of Cincinnati, the University of Minnesota, and Northern Arizona University.

Appendix

Table A1: List of Departmental Dummy Variables

Variable Name	Description
DD1	School of Accountancy
DD2	Agricultural Economics
DD5	Division of Animal Sciences
DD6	Anthropology
DD8	Art History and Classical Archaeology
DD9	Art
DD10	Biochemistry (Agriculture)
DD11	Bioengineering
DD12	Biological Engineering
DD13	Division of Biological Sciences
DD14	Biomedical Sciences
DD16	Chemical Engineering
DD17	Chemistry
DD18	Civil/Environmental Engineering
DD19	Classical Studies
DD20	Communication Sciences and Disorders
DD21	Communication
DD22	Computer Science
DD23	Economics
DD24	Educational Leadership and Policy Analysis
DD25	Educational, School and Counseling Psychology
DD26	Electrical and Computer Engineering
DD27	English
DD28	Finance
DD29	Fisheries and Wildlife Sciences
DD30	Food Science
DD31	Forestry
DD32	Geography
DD33	Geological Sciences
DD34	German and Russian Studies
DD35	Health Psychology
DD36	Health Sciences **
DD37	History
DD39	Human Development and Family Studies
DD40	Industrial/Manufacturing Systems Engineering
DD41	School of Information Science and Learning Technologies
DD42	School of Journalism

DD43	School of Law **
DD44	Learning Teaching and Curriculum
DD45	Management
DD46	Marketing
DD47	Mathematics
DD48	Mechanical and Aerospace Engineering
DD49	School of Music
DD50	School of Nursing
DD51	Nutrition and Exercise Physiology
DD55	Philosophy
DD57	Physics
DD58	Division of Plant Sciences
DD59	Political Science
DD60	Psychological Sciences
DD61	School of Public Affairs
DD62	Religious Studies
DD63	Romance Languages and Literature
DD65	School of Social Work
DD66	Sociology
DD67	Soil, Environmental and Atmospheric Sciences
DD68	Special Education
DD69	Statistics
DD71	Theatre
DD72	Veterinary Medicine and Surgery
DD73	Veterinary Pathobiology
DD75	Agricultural Systems Management, Agricultural Education, Hotel and Restaurant Management, Parks Recreation and Tourism, or Rural Sociology
DD76	Architectural Studies, Personal Financial Planning, or Textile and Apparel Management
DD77	Black Studies Program or Women's and Gender Studies
DD78	Occupational Therapy or Physical Therapy *

Notes: * Reference category for salary models. ** Omitted from salary models due to missing data on research productivity z-score.

Results from Model Without Controlling for Rank (Table 6)

Robust regression

Number of obs = 966
F(73, 892) = 40.01
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.0137555	.013108	-1.05	0.294	-.0394817	.0119707
minority	-.0002968	.0219838	-0.01	0.989	-.0434427	.0428491
nonphd	-.0284276	.0330555	-0.86	0.390	-.0933031	.036448
yrsotherUM	-.0020768	.0011069	-1.88	0.061	-.0042491	.0000956
age	.0063134	.0009188	6.87	0.000	.0045102	.0081166
adminjob	.1581321	.0179668	8.80	0.000	.1228698	.1933943
yrsrank	.0131646	.0024013	5.48	0.000	.0084518	.0178773
yrs2full	-.000141	.0000677	-2.08	0.038	-.0002738	-8.16e-06
yrs2assoc	-.0006534	.0000745	-8.77	0.000	-.0007996	-.0005072
yrs2asst	-.0048028	.0008951	-5.37	0.000	-.0065594	-.0030461
avgzscore	.1146827	.0066619	17.21	0.000	.101608	.1277575
dd1	.9247758	.0735619	12.57	0.000	.7804013	1.06915
dd2	.3085832	.0654573	4.71	0.000	.180115	.4370515
dd5	.1630866	.0624624	2.61	0.009	.0404962	.285677
dd6	-.1890145	.073516	-2.57	0.010	-.333299	-.0447301
dd8	-.1566705	.0829161	-1.89	0.059	-.319404	.0060629
dd9	-.0624203	.0745269	-0.84	0.403	-.2086889	.0838482
dd10	.2663164	.0692574	3.85	0.000	.1303899	.4022429
dd11	.1707995	.083211	2.05	0.040	.0074874	.3341116
dd12	.3657477	.0799172	4.58	0.000	.2089	.5225953
dd13	.2092168	.0605712	3.45	0.001	.0903381	.3280955
dd14	.2297392	.0681898	3.37	0.001	.095908	.3635704
dd16	.4087655	.0777772	5.26	0.000	.2561178	.5614132
dd17	.2179098	.0654729	3.33	0.001	.089411	.3464086
dd18	.3936418	.0687297	5.73	0.000	.2587509	.5285326
dd19	-.0755501	.0798142	-0.95	0.344	-.2321955	.0810953
dd20	.0375941	.0922116	0.41	0.684	-.143383	.2185711
dd21	-.0755948	.077433	-0.98	0.329	-.2275668	.0763773
dd22	.4321833	.0665255	6.50	0.000	.3016186	.562748

dd23	.5261244	.0658352	7.99	0.000	.3969145	.6553344
dd24	.0720825	.0723727	1.00	0.320	-.0699581	.2141232
dd25	.0768022	.0693882	1.11	0.269	-.0593809	.2129854
dd26	.4175485	.0638503	6.54	0.000	.2922342	.5428629
dd27	-.035912	.0596201	-0.60	0.547	-.152924	.0811
dd28	.9906547	.0829863	11.94	0.000	.8277836	1.153526
dd29	-.1031745	.0833566	-1.24	0.216	-.2667724	.0604234
dd30	.0976036	.0796533	1.23	0.221	-.0587261	.2539333
dd31	-.0093589	.0796216	-0.12	0.906	-.1656265	.1469087
dd32	.0220424	.0829612	0.27	0.791	-.1407794	.1848642
dd33	.0582959	.0708574	0.82	0.411	-.0807707	.1973626
dd34	-.120797	.0752897	-1.60	0.109	-.2685626	.0269685
dd35	.2958065	.0995296	2.97	0.003	.1004671	.491146
dd36	0	(omitted)				
dd37	-.0250127	.0636164	-0.39	0.694	-.1498679	.0998425
dd39	.0665675	.0770785	0.86	0.388	-.0847089	.217844
dd40	.4309782	.0800143	5.39	0.000	.27394	.5880164
dd41	.1515029	.071089	2.13	0.033	.0119816	.2910242
dd42	.05969	.0666156	0.90	0.370	-.0710516	.1904316
dd43	0	(omitted)				
dd44	.0964184	.0642043	1.50	0.134	-.0295908	.2224275
dd45	.632758	.0690448	9.16	0.000	.4972488	.7682673
dd46	.7286418	.0800328	9.10	0.000	.5715672	.8857164
dd47	.2351205	.0606754	3.88	0.000	.1160373	.3542037
dd48	.3397409	.0641456	5.30	0.000	.2138471	.4656348
dd49	-.1235712	.0619953	-1.99	0.047	-.2452448	-.0018975
dd50	.0244301	.0695806	0.35	0.726	-.1121308	.160991
dd51	-.035415	.0868237	-0.41	0.683	-.2058175	.1349875
dd55	.0926182	.0682178	1.36	0.175	-.0412678	.2265042
dd57	.2033342	.0630575	3.22	0.001	.0795758	.3270926
dd58	.0829171	.0619372	1.34	0.181	-.0386424	.2044767
dd59	.1198246	.0707409	1.69	0.091	-.0190134	.2586625
dd60	.1786148	.0602364	2.97	0.003	.0603932	.2968365
dd61	.2907296	.0869279	3.34	0.001	.1201226	.4613366
dd63	-.1228716	.0657615	-1.87	0.062	-.2519368	.0061937
dd65	-.0026857	.0723435	-0.04	0.970	-.1446689	.1392975
dd66	.1092722	.0708676	1.54	0.123	-.0298144	.2483589
dd67	-.0828042	.077634	-1.07	0.286	-.2351709	.0695624

dd68	.0185539	.0777354	0.24	0.811	-.1340117	.1711195
dd69	.2832421	.0677355	4.18	0.000	.1503025	.4161817
dd71	-.0750637	.0809028	-0.93	0.354	-.2338458	.0837183
dd72	.3390849	.0635258	5.34	0.000	.2144074	.4637624
dd73	.2387167	.0630959	3.78	0.000	.1148829	.3625505
dd75	.0829979	.0721506	1.15	0.250	-.0586067	.2246025
dd76	.1929656	.0707137	2.73	0.006	.054181	.3317501
dd77	.1033002	.0927587	1.11	0.266	-.0787505	.2853509
_cons	10.8892	.063846	170.55	0.000	10.7639	11.01451

Results from Model With Controlling for Rank (Table 6)

Robust regression

Number of obs = 966
F(77, 888) = 66.89
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.0151904	.0103631	-1.47	0.143	-.0355295	.0051487
minority	.0122466	.0173612	0.71	0.481	-.0218271	.0463203
nonphd	-.0123674	.0262992	-0.47	0.638	-.0639832	.0392484
yrsotherUM	-.0074596	.0009635	-7.74	0.000	-.0093505	-.0055686
age	-.000726	.0008402	-0.86	0.388	-.002375	.0009229
adminjob	.1168674	.0143707	8.13	0.000	.0886628	.1450719
yrsrank	.0108155	.0019215	5.63	0.000	.0070443	.0145867
yrs2full	-.0002114	.0000541	-3.91	0.000	-.0003177	-.0001052
yrs2assoc	-.0003351	.0000612	-5.47	0.000	-.0004553	-.0002149
yrs2asst	-.002448	.0008588	-2.85	0.004	-.0041335	-.0007625
avgzscore	.0765038	.0057214	13.37	0.000	.0652747	.0877329
full	.2986133	.0248698	12.01	0.000	.2498029	.3474237
assoc	.0632746	.0193318	3.27	0.001	.0253333	.1012159
curator	.0847934	.0276363	3.07	0.002	.0305532	.1390335
named	.1631349	.0189054	8.63	0.000	.1260305	.2002394
dd1	.8496648	.058208	14.60	0.000	.7354234	.9639062
dd2	.2697006	.0518076	5.21	0.000	.168021	.3713803
dd5	.0686038	.0495975	1.38	0.167	-.0287383	.1659459
dd6	-.1697273	.0580578	-2.92	0.004	-.2836738	-.0557809
dd8	-.1367867	.0655337	-2.09	0.037	-.2654058	-.0081677
dd9	-.1504274	.059056	-2.55	0.011	-.2663331	-.0345217
dd10	.217821	.0548557	3.97	0.000	.110159	.3254829
dd11	.1073625	.0659974	1.63	0.104	-.0221664	.2368915
dd12	.3032533	.0631572	4.80	0.000	.1792985	.427208
dd13	.1628185	.0479955	3.39	0.001	.0686206	.2570163
dd14	.1896987	.053962	3.52	0.000	.0837907	.2956066
dd16	.2897307	.0617548	4.69	0.000	.1685284	.410933
dd17	.1065445	.0519653	2.05	0.041	.0045554	.2085337
dd18	.3227216	.0544953	5.92	0.000	.2157671	.4296761

dd19	-.0952638	.0629828	-1.51	0.131	-.2188762	.0283486
dd20	.0550251	.072798	0.76	0.450	-.087851	.1979013
dd21	-.1219051	.0612581	-1.99	0.047	-.2421327	-.0016776
dd22	.3333223	.0527037	6.32	0.000	.229884	.4367607
dd23	.4498859	.0522385	8.61	0.000	.3473606	.5524112
dd24	.0721558	.0571341	1.26	0.207	-.0399778	.1842894
dd25	.0452246	.0548985	0.82	0.410	-.0625213	.1529706
dd26	.321885	.0507421	6.34	0.000	.2222966	.4214734
dd27	-.0617837	.0471849	-1.31	0.191	-.1543906	.0308233
dd28	.7563943	.0657587	11.50	0.000	.6273338	.8854548
dd29	-.1575197	.0659799	-2.39	0.017	-.2870145	-.028025
dd30	.0762631	.0629224	1.21	0.226	-.0472309	.1997572
dd31	-.0769645	.0629512	-1.22	0.222	-.2005149	.0465859
dd32	.0172516	.0655109	0.26	0.792	-.1113227	.145826
dd33	-.0350003	.0562584	-0.62	0.534	-.1454152	.0754147
dd34	-.1150328	.0594785	-1.93	0.053	-.2317676	.001702
dd35	.2440152	.0786693	3.10	0.002	.0896157	.3984148
dd36	0	(omitted)				
dd37	-.0877688	.0502996	-1.74	0.081	-.1864887	.010951
dd39	.0597188	.0608235	0.98	0.326	-.0596558	.1790934
dd40	.31875	.0634326	5.03	0.000	.1942547	.4432452
dd41	.1310531	.0563085	2.33	0.020	.0205398	.2415664
dd42	.0670581	.0526657	1.27	0.203	-.0363056	.1704219
dd43	0	(omitted)				
dd44	.0654501	.0507658	1.29	0.198	-.0341848	.165085
dd45	.5267809	.0545989	9.65	0.000	.419623	.6339387
dd46	.5335247	.0641439	8.32	0.000	.4076333	.6594161
dd47	.1216287	.0486277	2.50	0.013	.0261901	.2170673
dd48	.2338585	.0510088	4.58	0.000	.1337467	.3339704
dd49	-.1312692	.0489692	-2.68	0.007	-.227378	-.0351603
dd50	.0729051	.0549576	1.33	0.185	-.0349568	.1807671
dd51	-.0440982	.0685734	-0.64	0.520	-.1786831	.0904867
dd55	.0197362	.0539815	0.37	0.715	-.08621	.1256823
dd57	.1106801	.0501758	2.21	0.028	.012203	.2091571
dd58	.035131	.0490958	0.72	0.474	-.0612263	.1314884
dd59	.0506553	.0560832	0.90	0.367	-.0594157	.1607264
dd60	.0825725	.0481064	1.72	0.086	-.0118429	.1769879
dd61	.2251383	.0688093	3.27	0.001	.0900905	.360186

dd63	-.1224743	.0518956	-2.36	0.018	-.2243266	-.0206219
dd65	-.000819	.0571694	-0.01	0.989	-.1130219	.1113838
dd66	.0948365	.055977	1.69	0.091	-.0150262	.2046993
dd67	-.1605591	.0614013	-2.61	0.009	-.2810677	-.0400504
dd68	.0282093	.061524	0.46	0.647	-.0925402	.1489587
dd69	.2383157	.0536549	4.44	0.000	.1330104	.3436209
dd71	-.1826435	.0641288	-2.85	0.005	-.3085052	-.0567817
dd72	.3071019	.0502814	6.11	0.000	.2084176	.4057862
dd73	.231198	.049945	4.63	0.000	.1331741	.329222
dd75	.0283316	.0570651	0.50	0.620	-.0836667	.1403298
dd76	.1804788	.0558609	3.23	0.001	.0708441	.2901136
dd77	.0570158	.0733055	0.78	0.437	-.0868565	.200888
_cons	11.17044	.0529247	211.06	0.000	11.06656	11.27431

Results from Model for College of Arts and Sciences (Table 8)

Robust regression

Number of obs = 447
F(39, 407) = 67.34
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.0145137	.0129586	-1.12	0.263	-.0399878	.0109605
minority	.0212907	.0212373	1.00	0.317	-.0204579	.0630392
nonphd	-.0040835	.0304446	-0.13	0.893	-.0639318	.0557649
yrsotherUM	-.0105324	.0014163	-7.44	0.000	-.0133167	-.0077481
age	-.0006168	.0011752	-0.52	0.600	-.002927	.0016933
adminjob	.0839758	.0191865	4.38	0.000	.0462588	.1216927
yrsrank	.0127814	.0026895	4.75	0.000	.0074944	.0180684
yrs2full	-.0001681	.0000811	-2.07	0.039	-.0003275	-8.62e-06
yrs2assoc	-.0003879	.0000993	-3.91	0.000	-.0005831	-.0001927
yrs2asst	-.0020515	.0010751	-1.91	0.057	-.004165	.000062
avgzscore	.0695656	.0082358	8.45	0.000	.0533756	.0857556
full	.3178689	.0346323	9.18	0.000	.2497884	.3859494
assoc	.0583592	.025385	2.30	0.022	.0084571	.1082614
curator	-.0569046	.0428057	-1.33	0.184	-.1410525	.0272433
named	.2346597	.0380283	6.17	0.000	.1599032	.3094161
dd6	-.1397101	.06026	-2.32	0.021	-.2581699	-.0212504
dd8	-.1301528	.066096	-1.97	0.050	-.2600849	-.0002207
dd9	-.1389337	.0632998	-2.19	0.029	-.2633691	-.0144983
dd13	.1668677	.052899	3.15	0.002	.0628783	.2708571
dd17	.1074923	.0557683	1.93	0.055	-.0021376	.2171223
dd19	-.0733606	.0642549	-1.14	0.254	-.1996736	.0529523
dd21	-.1001546	.0627987	-1.59	0.112	-.2236049	.0232957
dd23	.4476822	.0561796	7.97	0.000	.3372438	.5581205
dd27	-.0482444	.052026	-0.93	0.354	-.1505175	.0540288
dd32	.0488311	.0660113	0.74	0.460	-.0809346	.1785967
dd33	-.0165968	.0589508	-0.28	0.778	-.1324827	.0992892
dd34	-.0820589	.0613094	-1.34	0.182	-.2025815	.0384637
dd37	-.0746941	.0542016	-1.38	0.169	-.1812441	.031856
dd47	.1214698	.0536482	2.26	0.024	.0160077	.2269319

dd49	-.1299414	.0537317	-2.42	0.016	-.2355678	-.0243151
dd55	.036689	.0572062	0.64	0.522	-.0757675	.1491455
dd57	.1031772	.0544247	1.90	0.059	-.0038115	.2101659
dd59	.0673574	.0588447	1.14	0.253	-.0483201	.1830348
dd60	.0969014	.0529724	1.83	0.068	-.0072323	.2010351
dd63	-.1119421	.0554994	-2.02	0.044	-.2210432	-.0028409
dd66	.1050308	.0585615	1.79	0.074	-.01009	.2201515
dd69	.2534827	.0567762	4.46	0.000	.1418715	.3650938
dd71	-.1658323	.0652992	-2.54	0.011	-.2941981	-.0374665
dd77	.0511847	.0719542	0.71	0.477	-.0902636	.1926331
_cons	11.15268	.0656772	169.81	0.000	11.02357	11.28178

Results from Model for College of Agriculture, Food, and Natural Resources (Table 8)

Robust regression

Number of obs = 143
F(23, 119) = 18.88
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	.0081862	.0396009	0.21	0.837	-.0702276	.0866
minority	.0530878	.0783233	0.68	0.499	-.1020002	.2081758
nonphd	0	(omitted)				
yrsotherUM	-.0122654	.0028493	-4.30	0.000	-.0179072	-.0066236
age	.0034541	.0028962	1.19	0.235	-.0022807	.0091889
adminjob	.1920355	.0530697	3.62	0.000	.0869521	.2971188
yrsrank	-.0047045	.0069244	-0.68	0.498	-.0184155	.0090065
yrs2full	.0001867	.0002246	0.83	0.407	-.000258	.0006314
yrs2assoc	-.0000418	.000204	-0.20	0.838	-.0004457	.0003621
yrs2asst	-.0011399	.0030297	-0.38	0.707	-.007139	.0048592
avgzscore	.1135772	.0200797	5.66	0.000	.0738175	.1533369
full	.3704326	.0905835	4.09	0.000	.1910682	.5497969
assoc	.2164706	.0802434	2.70	0.008	.0575806	.3753606
curator	.1114123	.0988073	1.13	0.262	-.0842359	.3070606
named	.2430868	.060141	4.04	0.000	.1240017	.3621719
dd2	.3789703	.0806015	4.70	0.000	.2193714	.5385693
dd5	.2597756	.0766152	3.39	0.001	.1080699	.4114813
dd10	.4183816	.0852632	4.91	0.000	.249552	.5872113
dd11	.364657	.0980804	3.72	0.000	.1704481	.558866
dd30	.2039085	.0958411	2.13	0.035	.0141336	.3936834
dd31	.0299967	.0945687	0.32	0.752	-.1572588	.2172522
dd58	.2103016	.0770561	2.73	0.007	.0577228	.3628805
dd67	-.0102592	.0925211	-0.11	0.912	-.1934602	.1729418
dd75	.1626109	.0881127	1.85	0.067	-.0118611	.3370829
_cons	10.80144	.1407539	76.74	0.000	10.52274	11.08015

Results from Model for College of Engineering (Table 8)

Robust regression

Number of obs = 104
F(20, 83) = 15.04
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.0361735	.0478515	-0.76	0.452	-.1313482	.0590013
minority	-.1993534	.0796118	-2.50	0.014	-.3576981	-.0410088
nonphd	-.0052532	.1057838	-0.05	0.961	-.2156529	.2051465
yrsotherUM	-.0047547	.0029084	-1.63	0.106	-.0105395	.00103
age	-.0039465	.002731	-1.45	0.152	-.0093784	.0014854
adminjob	.1526744	.044532	3.43	0.001	.0641019	.2412468
yrsrank	.0045303	.0059459	0.76	0.448	-.0072958	.0163564
yrs2full	.0001741	.0001552	1.12	0.265	-.0001346	.0004829
yrs2assoc	-.0001168	.0001604	-0.73	0.469	-.0004358	.0002023
yrs2asst	-.000765	.0044059	-0.17	0.863	-.0095281	.0079981
avgzscore	.0548507	.0165586	3.31	0.001	.0219164	.087785
full	.2923874	.0812807	3.60	0.001	.1307234	.4540514
assoc	.0983087	.0752915	1.31	0.195	-.0514431	.2480605
curator	0	(omitted)				
named	.160686	.0373548	4.30	0.000	.0863888	.2349831
dd12	-.0221933	.0701637	-0.32	0.753	-.1617461	.1173594
dd16	-.0238472	.0662618	-0.36	0.720	-.1556392	.1079449
dd18	.008737	.0624882	0.14	0.889	-.1155496	.1330236
dd22	.0222505	.0576026	0.39	0.700	-.0923188	.1368197
dd26	.024775	.0562244	0.44	0.661	-.087053	.136603
dd48	-.065773	.0550181	-1.20	0.235	-.1752019	.0436558
_cons	11.62124	.117783	98.67	0.000	11.38698	11.85551

Results from Model for Social Sciences Divisions (Table 9)

```
Robust regression                                       Number of obs =     145
                                                        F( 23,   121) =   29.08
                                                        Prob > F      =  0.0000

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     lsalary |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |  -.0246644   .0324521    -0.76   0.449    -.0889118     .039583
    minority |   .1012146    .047919     2.11   0.037     .0063463    .1960829
      nonphd |  -.0662498   .1217423    -0.54   0.587    -.3072709    .1747713
  yrsotherUM |  -.0096672   .0031315    -3.09   0.003    -.0158669   -.0034675
         age |   .0012661   .0028217     0.45   0.654    -.0043203    .0068524
    adminjob |   .0973718   .0472049     2.06   0.041     .0039172    .1908264
     yrsrank |   .0045156   .0070567     0.64   0.523    -.0094551    .0184862
    yrs2full |   .0004064   .0002126     1.91   0.058    -.0000145    .0008272
   yrs2assoc |  -.0003213   .0002053    -1.56   0.120    -.0007278    .0000852
    yrs2asst |  -.0014459   .0024848    -0.58   0.562    -.0063652    .0034733
   avgzscore |   .0912552   .0202376     4.51   0.000     .0511895    .1313209
        full |   .3030591   .0774074     3.92   0.000     .1498108    .4563074
       assoc |   .0886884   .0612734     1.45   0.150    -.0326183    .2099952
     curator |  -.1084019   .0818286    -1.32   0.188    -.2704033    .0535994
       named |   .2360044   .0617899     3.82   0.000      .113675    .3583339
         dd2 |   .2349955   .0739261     3.18   0.002     .0886393    .3813517
        dd23 |   .4102704   .0725261     5.66   0.000     .2666858     .553855
        dd37 |   -.110644   .0727098    -1.52   0.131    -.2545922    .0333042
        dd59 |   .0272366   .0755392     0.36   0.719    -.1223131    .1767863
        dd60 |    .082566    .069419     1.19   0.237    -.0548673    .2199994
        dd66 |    .079511   .0787753     1.01   0.315    -.0764456    .2354675
        dd75 |   .1644133   .0928978     1.77   0.079    -.0195024    .3483291
        dd77 |   .0332131     .10355     0.32   0.749    -.1717914    .2382176
       _cons |   11.10838   .1176978    94.38   0.000     10.87536    11.34139
------------------------------------------------------------------------------
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Results from Model for Sciences Divisions (Table 9)

Robust regression

Number of obs = 190
F(22, 167) = 31.45
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.01883	.0257485	-0.73	0.466	-.0696645	.0320044
minority	-.0622152	.0507151	-1.23	0.222	-.1623406	.0379101
nonphd	.0675028	.1408853	0.48	0.632	-.2106429	.3456485
yrsotherUM	-.0142433	.0021872	-6.51	0.000	-.0185615	-.0099252
age	.0028519	.0021477	1.33	0.186	-.0013882	.0070921
adminjob	.0573279	.0380078	1.51	0.133	-.0177098	.1323657
yrsrank	.0137379	.0045239	3.04	0.003	.0048065	.0226693
yrs2full	-.0002775	.0001372	-2.02	0.045	-.0005484	-6.59e-06
yrs2assoc	-.0003752	.0001568	-2.39	0.018	-.0006847	-.0000656
yrs2asst	.00098	.0016299	0.60	0.548	-.0022378	.0041979
avgzscore	.1079437	.0128828	8.38	0.000	.0825095	.1333779
full	.2997325	.0557336	5.38	0.000	.1896994	.4097657
assoc	.0823368	.0471478	1.75	0.083	-.0107458	.1754194
curator	.0293414	.0653814	0.45	0.654	-.0997393	.158422
named	.1643602	.0606328	2.71	0.007	.0446546	.2840657
dd5	.0927095	.0459723	2.02	0.045	.0019478	.1834713
dd10	.1985657	.0530878	3.74	0.000	.093756	.3033755
dd13	.1551069	.0449656	3.45	0.001	.0663325	.2438812
dd17	.12395	.0500612	2.48	0.014	.0251157	.2227844
dd47	.1258617	.0446787	2.82	0.005	.0376538	.2140697
dd57	.1259086	.0471642	2.67	0.008	.0327937	.2190234
dd69	.2625523	.0510719	5.14	0.000	.1617224	.3633821
_cons	11.00675	.0871102	126.35	0.000	10.83477	11.17872

Results from Model for Arts and Humanities Division (Table 9)

Robust regression

Number of obs = 182
F(26, 155) = 26.18
Prob > F = 0.0000

lsalary	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.0141736	.0155232	-0.91	0.363	-.044838	.0164908
minority	.0304352	.0262315	1.16	0.248	-.0213821	.0822525
nonphd	.0221905	.0294144	0.75	0.452	-.0359143	.0802953
yrsotherUM	-.0093967	.0018737	-5.01	0.000	-.013098	-.0056953
age	-.0019982	.0014334	-1.39	0.165	-.0048298	.0008334
adminjob	.1013567	.023512	4.31	0.000	.0549114	.1478019
yrsrank	.011101	.0035016	3.17	0.002	.0041839	.0180181
yrs2full	-.0002548	.0001075	-2.37	0.019	-.0004672	-.0000424
yrs2assoc	-.0004036	.0001571	-2.57	0.011	-.0007139	-.0000933
yrs2asst	-.0009477	.0019322	-0.49	0.624	-.0047646	.0028691
avgzscore	.0340504	.0117937	2.89	0.004	.0107532	.0573476
full	.4163056	.0499696	8.33	0.000	.3175963	.5150149
assoc	.101246	.0346564	2.92	0.004	.0327862	.1697058
curator	-.1061569	.0668005	-1.59	0.114	-.2381137	.0257998
named	.208847	.0540462	3.86	0.000	.1020847	.3156092
dd6	-.1036264	.0505531	-2.05	0.042	-.2034883	-.0037645
dd8	-.0869357	.0552604	-1.57	0.118	-.1960964	.0222249
dd9	-.1660808	.0544557	-3.05	0.003	-.2736518	-.0585098
dd19	-.0709612	.0547508	-1.30	0.197	-.1791153	.0371929
dd21	-.0955075	.0532417	-1.79	0.075	-.2006806	.0096655
dd27	-.0314589	.0435747	-0.72	0.471	-.1175358	.0546181
dd34	-.0581107	.051263	-1.13	0.259	-.159375	.0431537
dd49	-.12065	.0450228	-2.68	0.008	-.2095876	-.0317125
dd55	-.0004786	.0489145	-0.01	0.992	-.0971038	.0961465
dd63	-.1187763	.0465649	-2.55	0.012	-.21076	-.0267926
dd71	-.177114	.0552853	-3.20	0.002	-.2863239	-.067904
_cons	11.16103	.0705309	158.24	0.000	11.0217	11.30036