A Statistical Investigation of Equity in Faculty Salaries at the University of Vermont

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Executive Summary

In summer 2013, at the request of President Thomas Sullivan and under the direction of Vice President for Human Resources, Diversity, and Multicultural Affairs Wanda Heading-Grant, the University of Vermont engaged a statistical consultant to conduct an analysis of faculty salary at UVM, focusing specifically on investigating whether there is statistical evidence of a gap in salary associated with gender or with minority status.

Multiple linear regression was used to determine whether there was evidence of a gap in salary due to gender or minority status after various adjustment factors considered to influence salary were taken into account (such as department, years of faculty employment at the university, etc.). The data used for analyses were those effective November 11, 2012 and included tenured and tenure-track faculty. Faculty from all schools and colleges were included in this study except those from Medicine. College of Medicine faculty were excluded because of differences in the salary structure for those faculty. Merit data were not available and therefore not used.

In studies of this type an issue often discussed is whether or not to include professorial rank as an explanatory factor in the regression model. Although salaries typically increase as faculty move up through the ranks, as an explanatory variable in regression analyses of salary, rank is often referred to as a potentially "tainted" variable that might itself reflect gender or minority status bias. Therefore, two analyses were conducted in parallel. First, rank was included in the list of adjustment factors; in the second, rank was excluded. The average of the gaps estimated by these two methods will be referred to as the "combined" gap.

Taking the campus as a whole, in the analysis where rank was included in the list of explanatory variables, the gender gap was estimated to be -0.6%; that is, it was estimated that, on average, and taking other compensable factors into account that may affect salary, female faculty are paid 0.6% less than male faculty. In the analysis in which rank was excluded from the list of explanatory variables, it was estimated that female faculty are paid 0.5% less than male faculty. *Thus, the combined estimated gender gap is 0.5% – on average across the whole campus, and taking into account other compensable factors that may affect salary, it is estimated that male faculty are paid 0.5% more than female faculty.* The same analyses also provide estimates of any gap in salary due to minority status. In the analysis that included rank in the list of explanatory variables, the gap due to minority status was 0.7%; that is, on average and taking into account other compensable factors that might affect salary, minority persons are paid 0.7% higher than nonminority persons. In the analysis that excluded rank as a possible explanatory variable, the estimated gap was the same: 0.7%. Therefore, *on average across the whole campus, and taking into account other compensable factors that may affect salary, it is estimated that minority faculty are paid 0.7% more than nonminority faculty.* None of these gaps is "statistically significant" – the full report discusses the meaning of that term in this context.

Absent merit data, these results are based on the reasonable assumption that male and female faculty are equally meritorious overall; and likewise for minority and nonminority faculty. Also, without merit data, these methods and results have little to say about the appropriateness of the salary of any given individual. Further, because the individual colleges and schools are relatively small, these methods cannot be used to reliably assess salary gaps within those units. The report discusses less formal methods for administrators to assess individual or college-level situations. These might be employed in the spirit of conducting due diligence and as an alternative confirmation of the statistical results provided herein; it seems unnecessary for these efforts to be extensive in light of the overall conclusion of this study: there is essentially no statistical evidence of an overall gap in salaries due to gender or minority status.

Introduction

In summer 2013, at the request of President Thomas Sullivan and under the direction of Vice President for Human Resources, Diversity, and Multicultural Affairs Wanda Heading-Grant, the University of Vermont engaged a statistical consultant to conduct an analysis of faculty salary at UVM, focusing specifically on investigating whether there is statistical evidence of a gap in salary associated with gender or with minority status. This document summarizes the resulting analyses. The next section describes the methods used, the results, and some discussion of the issues underlying the analyses used and the interpretation of results. The Appendix contains technical details regarding the data and analyses.

Methods and Results

The data used for analyses were taken from campus databases; the data used for analyses were those effective November 11, 2012 and included tenured and tenure-track faculty. Faculty from the College of Medicine were excluded because of differences in the salary structure for those faculty.

For each faculty member, the following data were used: salary (converted, if necessary, to a 9-month basis), gender, whether the person has minority status (Hispanic or Latino/Latina, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or two or more races), number of years between terminal degree and hire as faculty at UVM, rank (assistant, associate, or full professor), number of years in rank, total number of years as a faculty member at UVM, and department. In addition, for each person a market value was calculated to reflect differences in salary among disciplines. (See the Appendix for details of this calculation.) Merit, i.e. performance, data were not available and thus were not considered.

The following two tables provide overall summaries of salaries (9 month basis) and years of (faculty) employment at UVM, classified by rank, gender, and minority status. Shown are averages and standard deviations (SD).

	All Ranks		**Asst Professor**		**Assoc Professor**		**Full Professor**	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Number	268	196	50	59	115	86	103	51
Yrs at UVM								
Average	15.6	11.9	3.8	2.8	13.6	13	23.6	20.4
SD	11.5	9.4	2.3	2.2	8.7	6.5	11.1	9.6
salary($)								
Average	95,714	87,709	70,967	69,317	87,869	83,489	116,485	116,103
SD	27,091	26,726	16,999	15,765	20,290	17,796	22,737	26,587

	All Ranks		Asst Professor		Assoc Professor		Full Professor	
	Minority	**Not Min**	**Minority**	**Not Min**	**Minority**	**Not Min**	**Minority**	**Not Min**
Number	76	388	25	84	31	170	20	134
Yrs at UVM								
Average	11.3	14.6	3.7	3.1	12.6	13.5	18.7	23.1
SD	8.8	11.1	1.7	2.5	6.6	8	9.8	10.8
salary($)								
Average	89,337	92,919	69,202	70,333	89,159	85,418	114,782	116,594
SD	27,380	27,159	15,244	16,663	20,247	19,174	28,345	23,389

From the first of these two tables it is evident that average salaries for males are higher than they are for females. This is true both overall and within each of the rank categories (although the discrepancy is quite small for full professors). Likewise, the second table shows a difference in average salaries favoring nonminority faculty. This difference can be seen for both assistant and full professors; for associate professors there is a difference in average salaries that favors minority faculty. (The relatively large standard deviations indicate that there is considerable variation from person to person in salary – this is typical in many universities.)

It is often argued in studies of salaries that simple averages do not adequately summarize salary structures: within a particular rank, for example, there might be unequal numbers of persons in high-paying disciplines (e.g. economics) and lower-paying disciplines (e.g. classics). To adequately judge possible discrepancies in salary, it is necessary to take into account those factors that are considered to legitimately affect salary levels. The most common tool for addressing this is the statistical approach known as multiple linear regression. Accordingly, multiple linear regression analyses were used to compare November 2012 salaries of male and female faculty, and minority and nonminority faculty, adjusting for factors thought to influence salary, including department, years of faculty employment at UVM, and years since terminal degree before employment at UVM as faculty. (A full list of the variables, i.e. “adjustment factors” or “explanatory variables” used in the regression models can be found in the Appendix.)

An issue often discussed is whether or not to include professorial rank as an explanatory factor in the regression model. Certainly we would expect salary to be related to rank: full professors generally make more money than assistant professors, and promotion in rank is commonly accompanied by an increase in salary. However, in studies of this kind rank is often referred to as a potentially “tainted” variable that might itself reflect gender or minority status bias. Specifically, the process of promotion through the ranks might be biased against women or minorities, and therefore using rank as an adjustment factor could lead to an incorrect estimate of a gap in salary due to gender or minority status. The same could be said for the assignment of rank at the time of hire. Therefore, two analyses were conducted in parallel. In the first set, rank was included in the list of adjustment factors; in the second, rank was excluded. The average of the gaps estimated by these two methods will be referred to as the “combined” gap.

In addition to the main analyses reported here, various diagnostic procedures (e.g., examination of residuals, influential points, etc.) were conducted to assess the adequacy of the models. There was no evidence of any violation of the statistical assumptions of the models, and so for brevity, the results of these diagnostic procedures are not commented upon further.

Findings:

Taking the campus as a whole, in the analysis where rank was included in the list of explanatory variables, the gender gap was estimated to be -0.6%; that is, it was estimated that, on average, and taking other compensable factors into account that may affect salary, female faculty are paid 0.6% less than male faculty. In the analysis in which rank was excluded from the list of explanatory variables, it was estimated that female faculty are paid 0.5% less than male faculty. *Thus, the combined estimated gender gap is 0.5%. That is, on average across the whole campus, and taking into account other compensable factors that may affect salary, it is estimated that male faculty are paid 0.5% more than female faculty.*

The similarity of the estimated gaps whether professorial rank is included or excluded is a bit remarkable, and suggests (but does not prove) that "rank" as an explanatory variable is not tainted to a high degree.

The same analyses also provide estimates of any gap in salary due to minority status. In the analysis that included rank in the list of explanatory variables, the gap due to minority status was 0.7%; that is, on average and taking into account other compensable factors that might affect salary, minority persons are paid 0.7% higher than nonminority persons. In the analysis that excluded rank as a possible explanatory variable, the estimated gap was the same: 0.7%. Therefore, *on average across the whole campus, and taking into account other compensable factors that may affect salary, it is estimated that minority faculty are paid 0.7% more than nonminority faculty.*

In many senses these estimated gaps are negligible. For example, the average salary for all faculty is $92,333. A difference of 0.7% applied to such a salary is $646; a difference of 0.5% is $462. In practice, these discrepancies are within the margin of error of typical salary systems where adjustments are made individually and merit is taken into account.[1] Viewed from a different perspective, few faculty members would be excited by a pay plan that promised a 1% increase; many would be pleased by an increase of 5%; a salary change of about one-half of a percent would be considered quite small.

[1] Further, the analyses in the Appendix show that the root mean square error for the multiple regressions is on the order of 10%. That is, even after taking into account the explanatory variables used in the models, salaries can vary by 10-20% from the average. A deviation of 0.5%, in that context, is very small.

Limitations of These Analyses

Although the methods employed in this report are common in analyses of equity in faculty salaries,[2] nonetheless, it is important to understand their limitations in order that the results are not over-interpreted. This is particularly important when policy decisions are based upon analyses such as these. Accordingly, some key issues are outlined next.

1. These analyses do not take into account any quantitative measure of merit – measures of scholarly performance – because such data are not generally available for faculty at the UVM campus. If quantitative measures of merit were available, some might question whether there exist potential biases in determining those values. Hence, it has been suggested that objective measures of merit be calculated based, for example, on measures of scholarly productivity. However, for a large and complex institution such as UVM, this is exceedingly difficult, not least due to interdisciplinary differences in the expectations of scholarly work. In some disciplines, published books are key indicators of success, while journal articles have that role in other disciplines, patents are important in some areas but not others, etc. Even among those disciplines that rely primarily on journal articles, for example, there are different conventions regarding order of authorship as an indicator of a person's contributions to the work. Thus, a database such as Web of Knowledge provides only partial information, at most, about the quality of a scholar's work.

   As a result, the analyses performed here and their interpretations are based on the assumption that, given the adjustment factors used in the regression models, men and women are equally meritorious *overall*, and that minority and nonminority faculty are equally meritorious overall. This certainly does not preclude the possibility that merit might vary considerably from individual to individual. This leads to the next point.

2. These results have very little to say about a given individual. The regression results of this report are useful for understanding broad trends but, absent quantitative merit data, these methods cannot assess whether a gap in salary exists for any given individual. Indeed, it can happen that there is an *average* estimated gap favoring women, but there might exist at the same time female faculty members whose salaries are too low. Likewise, it can happen that there is an average estimated gap favoring male faculty, but there might still be some female faculty whose salaries are too high relative to their merit. These regression analyses cannot reveal such situations. (An analogous remark can be made for minority and nonminority faculty.)

3. The methods employed here and the results obtained cannot be considered to provide a *proof* that there is not a gap in salary based on gender or minority status, not least because, as noted, merit data are unavailable. Although it is not immediately relevant at UVM, it is important to note the point that there can be situations where a regression analysis of the type used here reveals a sizeable average gap in salary between male and female faculty, but that gap is justified based upon merit information. Accordingly, it cannot be argued that the estimated regression coefficient for gender or minority status must always be zero. However, a large

[2] See, e.g. Gray, M. W. (1993) Can statistics tell us what we do not want to hear? The case of complex salary structures (with discussion). Statistical Science 8:144–179.

regression coefficient serves as a sentinel that further investigation of salaries is warranted. Moreover, if a gap is allowed to stand, then the reasons for doing so must be well-articulated and supportable. This holds whether the estimated gap is positive (favoring women or minorities) or negative (favoring men or nonminorities).

4. An issue often raised in the context of the use of regression analyses is whether the p-values ordinarily calculated in a regression analysis have meaning, because the data in this study involve a "population" rather than a sample.[3] The approach that is taken in this report is to focus on the size of the regression coefficients and on the consistency of patterns observed across analyses. From that perspective, the estimated gender gaps cited in this report can be viewed as adjusted averages. For example, based on the values that appear in the table on page 2, on average, male professors are paid about 9% more than female professors. However, this gap in salary reflects no adjustments for the factors included in the regression analyses – factors that are considered to legitimately affect salary. Once these various adjustment factors are taken into account, it is estimated that male professors are paid, on average, about 0.5% more than female professors (page 4). This provides a more nuanced and more appropriate assessment of salary differences.

5. The results presented in this report are for tenure and tenure track faculty on the campus as a whole (except for the College of Medicine). While it may be of interest to repeat these regression analyses within the individual colleges and schools, with the possible exception of the College of Arts and Sciences, the individual schools and colleges are too small to ensure that such analyses will provide a reliable assessment of salary gaps. This does not preclude the examination of salary structures through other means, however. Informally, a tool that can be useful to chairs and deans is a summary of salary information in tabular or graphic form; some find it useful to construct a plot of salary versus time of service in the institution, with the points on the graph identified by the names of faculty. Administrators can use such a plot (or table) to begin an assessment of whether salaries appear to match expectations based on productivity and scholarly record.

[3] See Freedman and Lane (1983) A nonstochastic interpretation of reported significance levels. Journal of Business and Economic Statistics 1:292–298. They argue that the formal application of significance tests can still serve a descriptive purpose; a large significance value suggests that a non-zero regression coefficient arises simply "accidentally." With that interpretation in mind, note that in the regression analyses, the with-rank and without-rank estimated gender gaps (-0.6% and -0.5%, resp.) have corresponding p-values of 0.58 and 0.63; for minority status the estimated gaps of 0.7% and 0.7% (with and without rank) have p-values of 0.58 and 0.62. (See SAS output in Appendix.) In a standard interpretation, these p-values indicate no statistical evidence of a gap in salary due to gender or minority status.

Conclusions

Based on the statistical analyses summarized in this report, after taking into account various factors thought to influence faculty salary (but not merit), there is essentially no statistical evidence of a campus-wide gap in salary associated with gender or minority status. A detailed analysis within colleges and schools is precluded by the relatively small size of most of those units. Even with the finding of no significant average gap in salary campus-wide, there could still be individuals within these units for whom a salary adjustment is warranted. An informal graphical approach could be used as a starting point to assess that possibility.

Appendix

Additional technical details regarding the regression analyses conducted for this report follow.

Variables Used in the Regressions

LnSalary November 11, 2012 faculty salaries were converted, if necessary, to a 9-month basis and then a natural logarithm transformation was used. Accordingly, to convert the gender coefficient from a regression model provided in the appendix to a percentage difference in annual salaries, one calculates: percentage = $e^b - 1$ where b is the parameter estimate from the regression. The log transformation of salaries therefore converts estimated gaps into percentage gaps, which is appropriate because salary changes usually occur on a percentage basis. In addition, this transformation helps to reduce heteroscedasticity in the data, an important assumption in regression modeling.

female An indicator variable with Male = 0; Female = 1.

URM Equals 1 if a member of a minority group; 0 otherwise. Minority status was defined to be: Hispanic or Latino/a, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or two or more races.

PrevExp Number of years from terminal degree to time of hire as UVM faculty member. An alternative would have been to use years since terminal degree. However, using **PrevExp** reduces the potential for multicollinearity, especially with **AstYrs, AssocYrs, ProfYrs, TotalUVMFacYrs** variables below.

NLMR Natural log of "market ratio." Market ratio was defined as the average salary at peer institutions for a given field and rank (based on OSU Faculty Salary Survey data) divided by the average peer salary for all fields of a given rank. Used to differentiate market differences in disciplines.

NLMR_ALL Natural log of average salary at peer institutions for a given field divided by the average peer salary for all fields. (This is essentially a weighted average of the market ratios in NLMR weighted for the proportion of faculty in the three ranks.) Used in the analyses that excluded rank as an adjustment factor.

RankPresDt Faculty rank as of November 11, 2012.

AstYrs Number of years in rank as assistant professor at UVM.

AssocYrs Number of years in rank as associate professor at UVM.

ProfYrs Number of years in rank as full professor at UVM.

TotalUVMFacYrs Number of years as a faculty member at UVM (equals total of the above three). Used in the analyses that excluded rank as an adjustment factor.

Department Indicator of department or unit (e.g. SBA) if unit is not departmentalized.

The following material displays the output (slightly edited, to save space) from SAS in fitting the aggregate regression models, with and without rank. Also to save space, output from other analyses are not shown.

All data analyses were performed by UVM's Office of Institutional Research. Many thanks are due to Dr. John Ryan, OIR Director, and his staff for their assistance with this work.

Model 1: With-rank model

The GLM Procedure

Dependent Variable: LnSalary ln(9-m Salary)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	46	30.65093180	0.66632460	69.38	<.0001
Error	417	4.00506125	0.00960446		
Corrected Total	463	34.65599305			

R-Square	Coeff Var	Root MSE	LnSalary Mean
0.884434	0.860112	0.098002	11.39413

Source	DF	Type III SS	Mean Square	F Value	Pr > F
female	1	0.00287132	0.00287132	0.30	0.5848
URM	1	0.00295451	0.00295451	0.31	0.5794
PrevExp	1	0.18134017	0.18134017	18.88	<.0001
RankPresDt	2	3.42428541	1.71214270	178.27	<.0001
AstYrs	1	0.05076629	0.05076629	5.29	0.0220
AssocYrs	1	0.12989419	0.12989419	13.52	0.0003
ProfYrs	1	0.64436919	0.64436919	67.09	<.0001
NLMR	1	0.23396687	0.23396687	24.36	<.0001
Department	37	0.87283697	0.02359019	2.46	<.0001

Parameter	Estimate		Standard Error	t Value	Pr > |t|
Intercept	11.46167741	B	0.05337859	214.72	<.0001
female	-0.00555970		0.01016827	-0.55	0.5848
URM	0.00732625		0.01320917	0.55	0.5794
PrevExp	0.00465565		0.00107144	4.35	<.0001
RankPresDt Assoc	-0.18638283	B	0.01586994	-11.74	<.0001
RankPresDt Ast	-0.37459180	B	0.01985513	-18.87	<.0001
RankPresDt Prof	0.00000000	B	.	.	.
AstYrs	-0.00609561		0.00265134	-2.30	0.0220
AssocYrs	0.00326437		0.00088765	3.68	0.0003
ProfYrs	0.00889259		0.00108567	8.19	<.0001
NLMR	0.56262692		0.11399344	4.94	<.0001
Department Animal Science	0.07901469	B	0.05484656	1.44	0.1504
Department Anthropology	0.04512995	B	0.04882874	0.92	0.3559
Department Art & Art History	-0.01562943	B	0.04409448	-0.35	0.7232
Department Asian Languages & Literatures	0.05519864	B	0.07934290	0.70	0.4870
Department Biology	0.01592803	B	0.05128379	0.31	0.7563
Department Chemistry	0.07084272	B	0.05467768	1.30	0.1958
Department Classics	-0.01110327	B	0.05583125	-0.20	0.8425
Department Com Dev & Applied Economics	-0.00104146	B	0.05822056	-0.02	0.9857
Department Communication Sciences	0.04451909	B	0.06315671	0.70	0.4813
Department Computer Science	0.18376911	B	0.07247119	2.54	0.0116
Department Economics	0.10651944	B	0.07419995	1.44	0.1519
Department Education	0.05250816	B	0.04311028	1.22	0.2239
Department English	0.00108325	B	0.04306701	0.03	0.9799
Department Geography	0.02385457	B	0.05447596	0.44	0.6617
Department Geology	0.10512634	B	0.05802996	1.81	0.0708
Department German & Russian	0.08416662	B	0.05775502	1.46	0.1458
Department History	-0.00627653	B	0.04370651	-0.14	0.8859
Department Leadership and Development Sci	0.05008032	B	0.04694534	1.07	0.2867
Department Mathematics & Statistics	0.12047091	B	0.04827240	2.50	0.0130
Department Medical Lab & Radiation Sci	0.07010096	B	0.07105817	0.99	0.3244
Department Music & Dance	0.02095779	B	0.04843234	0.43	0.6654
Department Nursing	0.05431884	B	0.05527822	0.98	0.3264
Department Nutrition & Food Sciences	0.01200964	B	0.06205654	0.19	0.8466
Department Philosophy	0.03445588	B	0.04773037	0.72	0.4708
Department Physics	0.08057346	B	0.05369756	1.50	0.1342
Department Plant & Soil Science	-0.00473745	B	0.05252955	-0.09	0.9282
Department Plant Biology	0.08975318	B	0.05407061	1.66	0.0977
Department Political Science	0.01583903	B	0.04869259	0.33	0.7451
Department Psychology	0.09342450	B	0.04916119	1.90	0.0581
Department RSENR Dean's Ofc	0.04133621	B	0.04525853	0.91	0.3616
Department Rehab & Movement Sci	0.05394795	B	0.05470549	0.99	0.3246
Department Religion	0.04857172	B	0.05586528	0.87	0.3851
Department Romance Languages&Linguistics	0.03340400	B	0.04450426	0.75	0.4533
Department Sch of Business Administration	0.28899881	B	0.09348981	3.09	0.0021

Department School of Engineering	0.16905234 B	0.05867295	2.88	0.0042
Department Social Work	0.06793469 B	0.05354704	1.27	0.2053
Department Sociology	0.08746289 B	0.04901722	1.78	0.0751
Department Theatre	0.00000000 B	.	.	.

NOTE: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.

Model 2: No-rank model

The GLM Procedure

Dependent Variable: LnSalary ln(9-m Salary)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	42	30.16481937	0.71820998	67.32	<.0001
Error	421	4.49117369	0.01066787		
Corrected Total	463	34.65599305			

R-Square	Coeff Var	Root MSE	LnSalary Mean
0.870407	0.906479	0.103285	11.39413

Source	DF	Type III SS	Mean Square	F Value	Pr > F
female	1	0.00254395	0.00254395	0.24	0.6256
URM	1	0.00264870	0.00264870	0.25	0.6185
PrevExp	1	0.63736232	0.63736232	59.75	<.0001
TotalUVMFacYrs	1	0.58293836	0.58293836	54.64	<.0001
NLMR_ALL	1	4.47146808	4.47146808	419.15	<.0001
Department	37	1.24647567	0.03368853	3.16	<.0001

Parameter		Estimate	Standard Error	t Value	Pr > |t|
Intercept		11.24522270 B	0.04468087	251.68	<.0001
female		-0.00522916	0.01070819	-0.49	0.6256
URM		0.00691650	0.01388062	0.50	0.6185
PrevExp		0.00754443	0.00097605	7.73	<.0001
TotalUVMFacYrs		0.00523120	0.00070767	7.39	<.0001
NLMR_ALL		0.68918271	0.03366264	20.47	<.0001
Department	Animal Science	0.07547832 B	0.05260965	1.43	0.1521
Department	Anthropology	0.05304460 B	0.04955429	1.07	0.2850
Department	Art & Art History	-0.01263703 B	0.04564574	-0.28	0.7820
Department	Asian Languages & Literatures	0.05983754 B	0.08311830	0.72	0.4720
Department	Biology	0.01388329 B	0.04800240	0.29	0.7726
Department	Chemistry	0.07277798 B	0.05072370	1.43	0.1521
Department	Classics	0.03739471 B	0.05661074	0.66	0.5093
Department	Com Dev & Applied Economics	-0.02553071 B	0.04900905	-0.52	0.6027
Department	Communication Sciences	0.06282592 B	0.06406513	0.98	0.3273
Department	Computer Science	0.16671834 B	0.05744898	2.90	0.0039
Department	Economics	0.06428916 B	0.05120821	1.26	0.2100
Department	Education	0.07055957 B	0.04418970	1.60	0.1111
Department	English	0.00862322 B	0.04339437	0.20	0.8426
Department	Geography	0.03462499 B	0.05504007	0.63	0.5296
Department	Geology	0.10016991 B	0.05734278	1.75	0.0814
Department	German & Russian	0.13047054 B	0.05967244	2.19	0.0293
Department	History	0.02120310 B	0.04410988	0.48	0.6310
Department	Leadership and Development Sci	0.07558633 B	0.04569408	1.65	0.0988
Department	Mathematics & Statistics	0.14172575 B	0.04493223	3.15	0.0017
Department	Medical Lab & Radiation Sci	0.05745718 B	0.07029499	0.82	0.4142
Department	Music & Dance	0.04950554 B	0.05081180	0.97	0.3305
Department	Nursing	0.08415641 B	0.05256917	1.60	0.1102
Department	Nutrition & Food Sciences	0.00673475 B	0.05350620	0.13	0.8999
Department	Philosophy	0.04778981 B	0.04921874	0.97	0.3321
Department	Physics	0.07879610 B	0.05022859	1.57	0.1175
Department	Plant & Soil Science	0.02470805 B	0.05230620	0.47	0.6369
Department	Plant Biology	0.10962558 B	0.05430624	2.02	0.0442
Department	Political Science	0.02380082 B	0.04509729	0.53	0.5979
Department	Psychology	0.10688935 B	0.04576283	2.34	0.0200
Department	RSENR Dean's Ofc	0.06040914 B	0.04333379	1.39	0.1640
Department	Rehab & Movement Sci	0.06035857 B	0.05381300	1.12	0.2627
Department	Religion	0.04214794 B	0.05758729	0.73	0.4646
Department	Romance Languages&Linguistics	0.05674334 B	0.04596449	1.23	0.2177

Department	Sch of Business Administration	0.22747646 B	0.05114743	4.45	<.0001
Department	School of Engineering	0.16163961 B	0.04508286	3.59	0.0004
Department	Social Work	0.09428736 B	0.05188840	1.82	0.0699
Department	Sociology	0.09728924 B	0.04783593	2.03	0.0426
Department	Theatre	0.00000000 B	.	.	.

NOTE: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.