

University of Louisville

*Study of Compensation Practices:
Pay Equity Results for Proposed
Salary Changes*

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Objectives of the Pay Equity Study

The overall objective of the study was to assess the internal equity of the staff salary structure of the University of Louisville (“Louisville”) after the implementation of the proposed salaries that result from the PwC Benchmark Staff Compensation Study. The purpose of this review was to ensure that Louisville’s policies are in compliance with the Equal Pay Act and Title VII of the Civil Rights Act. In order to accomplish these objectives, analyses were undertaken to determine any potential pay disparity based upon gender or race/ethnicity for the proposed salaries.

Methodology of the Pay Equity Study

- Multiple regression analysis was used to evaluate differences in pay and pay influencing characteristics, and to test whether there are differences in pay by gender or race/ethnicity after accounting for the legitimate pay influences.
- Separate analyses were conducted for exempt and non-exempt staff employees.
- The analyses controlled for education, years of service, years in grade, weekly hours, and part-time status. Also, the analyses used a series of indicator variables representing the different Louisville employee groups and grades.
- Two methods were used to detect differences in pay by gender or race/ethnicity for the proposed salaries:
 - We estimated the average pay differences by gender and by racial/ethnic group.
 - We calculated the difference between the proposed pay and the pay predicted by a salary regression for each employee, and then assessed the gender and racial/ethnic distribution of these pay differences.

Pay Equity Findings: Average Pay Differences

- For non-exempt employees, there is no statistically significant pay disparity, at a significance level of five percent, between males and females using the proposed salaries, after controlling for other pay influencing factors.
- For exempt employees, there is no statistically significant pay disparity, at a significance level of five percent, between males and females using the proposed salaries, after controlling for other pay influencing factors.
- For non-exempt employees, there is no statistically significant pay disparity, at a significance level of five percent, between minorities and non-minorities using the proposed salaries, after controlling for other pay influencing factors.
- For exempt employees, there is no statistically significant pay disparity, at a significance level of five percent, between minorities and non-minorities using the proposed salaries, after controlling for other pay influencing factors.

Pay Equity Findings: Differences between Proposed Pay and Pay Predicted by Regression

- There is no statistically significant difference, at a significance level of five percent, in the proportions of female and male employees, or in the proportions of minority and non-minority employees, whose proposed salaries are significantly *less* than predicted by the salary regression. This is true for both exempt and non-exempt employees.
- There is no statistically significant difference, at a significance level of five percent, in the proportions of female and male non-exempt employees whose proposed salaries are significantly *more* than predicted by the salary regression. For the exempt employees, there is a smaller proportion of female than male employees whose proposed salaries are significantly *more* than predicted by the salary regression.
- There is no statistically significant difference, at a significance level of five percent, in the proportions of minority and non-minority exempt employees whose proposed salaries are significantly *more* than predicted by the salary regression. For the non-exempt employees, there is a smaller proportion of minority than non-minority employees whose proposed salaries are significantly *more* than predicted by the salary regression.

Note: The analyses do not account for other factors that may influence pay, such as relevant prior experience or performance. These additional factors must be considered on an individual basis in evaluating the salaries of individuals who are being paid significantly more than predicted by the salary regression.

Pay Equity Recommendations

- PwC recommends that Louisville conduct annual pay equity analyses to ensure that equity is maintained after the proposed salary structure is instituted. The same regression specifications that appear in this report can be used as long as the factors that influence pay at Louisville remain the same. These analyses can be conducted in-house, with assistance supplied by PwC.
- PwC recommends that Louisville review the experience and performance of employees who are being paid significantly more than predicted by the salary regression to determine if the difference is justified.
- PwC recommends that Louisville institute a review of decisions on salaries for new hires by in-house staff familiar with the pay equity analysis to ensure that these new salaries meet the equity standards.
- PwC recommends that Louisville adopt a plan to enter the results of performance evaluations and information on prior work experience into the electronic employee database in the near future. These factors are important determinants of pay and could have a decisive impact on the understanding of pay differences in future pay equity analyses.

Introduction

The Economic Analysis group, within the Financial Advisory Services practice of PricewaterhouseCoopers LLP, was asked by the University of Louisville to conduct a study of pay equity among staff using the proposed salaries resulting from the PwC Benchmark Staff Compensation Study. The purpose of this pay equity study was to examine whether similarly situated women and men, and minorities and non-minorities, will be paid equivalent salaries under the proposed salary structure. We defined “similarly situated” in this analysis as being in the same employee group and grade, and having the same level of education, the same years of service at Louisville, the same years of service within grade, the same weekly hours, and the same full-time/part-time status. We studied all exempt and non-exempt staff, and performed separate analyses for these two groups.

Methodology

The study measured differences in pay and pay influencing characteristics and identified whether these differences are correlated. The statistical approach used to compare salaries was “multiple regression analysis.” This is a statistical technique that permits an analyst to examine the variations in salary from one employee to the next, removing all of the variation that can be accounted for by factors measured in the regression. In this case, the regression factors included employee group and grade, education level, years of service at Louisville, years of service in grade, weekly hours, and part-time/full-time status. After controlling for these other factors, it is possible to test whether there is a significant impact of gender or racial/ethnic differences. If there are differences and those differences cannot be attributed to chance or randomness, then gender or racial/ethnic pay disparities are presumed to exist. If the regression shows no significant pay differences associated with gender or racial/ethnic differences, then there is a presumption of pay equity.

Methodology

Salary was measured using the proposed salaries that result from the PwC Benchmark Staff Compensation Study. For the multiple regression analysis, we used the natural logarithm of base salary as the explanatory variable for exempt employees and the natural logarithm of hourly pay as the explanatory variable for non-exempt employees. Natural logarithms are often used in salary regressions when there is some expectation that the relationship between salary and the explanatory variables is log-normally distributed; i.e., the relationship is one of a constant rate rather than a constant amount.

The salary regressions controlled for employee group and grade, education level, years of service, years in grade, weekly hours, and part-time/full-time status. These factors were measured as follows:

- Employee group: A series of indicator variables for exempt employees representing positions classified as administrative, executive, professional, or management.
- Employee grade: A series of indicator variables for the proposed new grade level.
- Education level: A series of indicator variables for the employee's level of education.
- Years of service: Years of service at Louisville
- Years in grade: Years in current three-digit grade at Louisville.
- Weekly hours: Paid weekly hours.
- Part-time/full-time status: An indicator variable coded as part-time if weekly hours are less than 35.

Methodology

Two different methods were used to test whether gender or racial/ethnic pay disparities exist.

- The first method estimated the average pay difference between either male and female employees or between minority and non-minority employees, after removing all pay differences attributed to the factors enumerated above. If this remaining difference meets the benchmark level of statistical significance, pay disparities may exist; otherwise, pay equity is presumed.¹ For each of these tests, the gender or minority controls were added to the basic multiple regression equation.
- The second method compared the proposed pay with the pay predicted for each employee by the pay regression. Predicted pay was estimated using coefficients for the pay factors derived from regressions that included the legitimate pay factors but omitted the gender or minority controls. Predicted pay was then subtracted from actual pay, and a measure of the statistical significance of this disparity was computed. Pay disparities may exist when there are different proportions of male and female employees, or of minority and non-minority employees, who are being paid significantly more or less than predicted by the pay regression.

¹ In social science research, the 0.05 (five percent) level is conventionally used as a benchmark of statistical significance. The 0.05 level is approximately equal to two standard deviations. Differences that fail to meet this benchmark level of statistical significance are thought of as being too small and/or unreliable to be attributable to anything other than chance or measurement error. Differences that meet this benchmark level have a small likelihood (one in 20) of being attributable to chance and thus are presumed to be related to the protected characteristic.

Results for Multiple Regression Analyses with Tests for Gender Differences in Average Pay

The multiple regression analyses revealed that there are no statistically significant gender differences between similarly situated staff with the proposed salaries. This conclusion applies to both non-exempt and exempt employees. Statistical significance was tested at the five percent significance level. The summary results are shown in Table 1, with the full multiple regression results shown in Tables 2 and 3.

For both groups of employees, women are paid slightly less on average than men, but this difference is so small that it can be attributed to random variation. For non-exempt employees the size of this difference is -0.6 percent, and for exempt employees it is -0.3 percent.

The R-square statistic measures the explanatory power of each regression analysis in terms of the percentage of the salary variance that is explained by the pay factors in the regression. The results in Table 1 indicate that these regressions explain 85 and 89 percent of the salary variance for the non-exempt and exempt employees, respectively.

Results for Multiple Regression Analyses with Tests for Minority Differences in Average Pay

The multiple regression analyses revealed that there are no statistically significant minority differences between similarly situated staff with the proposed salaries. This conclusion applies to both non-exempt and exempt employees. Statistical significance was tested at the five percent significance level. The summary results are shown in Table 4, with the full multiple regression results shown in Tables 5 and 6.

For non-exempt employees, minorities are paid exactly the same on average as non-minorities with the proposed salaries. For exempt employees, minorities are paid slightly less on average than non-minorities, but this difference is so small that it can be attributed to random variation. The size of this difference is -0.3 percent.

The R-square statistics in Table 4 indicate that these regressions explain 85 and 89 percent of the salary variance for the non-exempt and exempt employees, respectively.

Differences between Proposed Pay and Pay Predicted by Regression

We calculated the differences between the proposed pay and the pay predicted by a pay regression, and then compared these differences to the expected differences based on the normal distribution. In a normal distribution, 50 percent of the population is expected to be paid as much or more than expected and 50 percent is expected to be paid as much or less than expected. In addition, 2.5 percent of the population is expected to be paid *significantly* above their predicted pay and 2.5 percent is expected to be paid *significantly* below their predicted pay. For each of the four groups, we compared the proportion of underpaid and overpaid employees to the proportions expected from the normal distribution. These comparisons were performed separately for female and male employees, and for minority and non-minority employees.

In addition to comparing the proportions of underpaid and overpaid employees to the proportions expected from the normal distribution, we also tested whether the female and male proportions were the same, and whether the minority and non-minority proportions were the same. These comparisons allowed us to determine whether the protected groups of employees were more underpaid or more overpaid than the non-protected groups.

Gender Contrasts for Differences between Proposed Pay and Pay Predicted by Regression

Table 7 summarizes the gender contrasts for differences between the proposed pay and the pay predicted by regression. A comparison of Table 7 with the expected results from a normal distribution reveals the following:

- For both women and men, there are fewer employees who are overpaid than the expected 50 percent and correspondingly more employees who are underpaid than the expected 50 percent. This result holds for both non-exempt and exempt employees.
- For both women and men, there are fewer employees who are significantly underpaid than the expected 2.5 percent. This result holds for both non-exempt and exempt employees.
- For both women and men, there are more employees who are significantly overpaid than the expected 2.5 percent. This result holds for both non-exempt and exempt employees.

Gender Contrasts for Differences between Proposed Pay and Pay Predicted by Regression

A comparison of the Table 7 percentages for women and men reveals the following:

- There is no statistically significant difference, at a significance level of five percent, in the proportions of female and male employees whose proposed salaries are significantly *less* than predicted by the salary regression. This is true for both exempt and non-exempt employees.
- There is no statistically significant difference, at a significance level of five percent, in the proportions of female and male non-exempt employees whose proposed salaries are significantly *more* than predicted by the salary regression.
- There is a smaller proportion of female than male exempt employees whose proposed salaries are significantly *more* than predicted by the salary regression. This difference in proportions is statistically significant at a significance level of five percent.

Note: The analyses do not account for other factors that may influence pay, such as relevant prior experience or performance. These additional factors must be considered on an individual basis in evaluating the salaries of individuals who are being paid significantly more than predicted by the salary regression.

Race/Ethnicity Contrasts for Differences between Proposed Pay and Pay Predicted by Regression

Table 8 summarizes the race/ethnicity contrasts for differences between the proposed pay and the pay predicted by regression. A comparison of Table 8 with the expected results from a normal distribution reveals the following:

- For both minorities and non-minorities, there are fewer employees who are overpaid than the expected 50 percent and correspondingly more employees who are underpaid than the expected 50 percent. This result holds for both non-exempt and exempt employees.
- For both minorities and non-minorities, there are fewer employees who are significantly underpaid than the expected 2.5 percent. This result holds for both non-exempt and exempt employees.
- For both minorities and non-minorities, there are more employees who are significantly overpaid than the expected 2.5 percent. This result holds for both non-exempt and exempt employees.

Race/Ethnicity Contrasts for Differences between Proposed Pay and Pay Predicted by Regression

A comparison of the Table 8 percentages for minorities and non-minorities reveals the following:

- There is no statistically significant difference, at a significance level of five percent, in the proportions of minority and non-minority employees whose proposed salaries are significantly *less* than predicted by the salary regression. This is true for both exempt and non-exempt employees.
- There is no statistically significant difference, at a significance level of five percent, in the proportions of minority and non-minority exempt employees whose proposed salaries are significantly *more* than predicted by the salary regression.
- There is a smaller proportion of minority than non-minority non-exempt employees whose proposed salaries are significantly *more* than predicted by the salary regression. This difference in proportions is statistically significant at a significance level of five percent.

Note: The analyses do not account for other factors that may influence pay, such as relevant prior experience or performance. These additional factors must be considered on an individual basis in evaluating the salaries of individuals who are being paid significantly more than predicted by the salary regression.

Recommendations

This analysis of the proposed salaries resulting from the PwC Benchmark Staff Compensation Study shows that the new salaries show no pay disparities for most Louisville staff.

The only area where the proposed salaries show possible pay equity issues involves individuals whose proposed salaries are significantly higher than the salaries predicted by the pay regression. The possible pay equity issues involve the difference in the proportions of female and male exempt employees who are paid significantly more than predicted by the pay regression, and the difference in the proportions of minority and non-minority non-exempt employees who are paid significantly more than predicted by the pay regression. These individuals are identified in Tables 9a and 9b. Since the salary regression does not use information on relevant prior experience or performance evaluations, it is likely that these additional factors explain the higher salaries for these individuals. However, PwC recommends that Louisville review the experience and performance of these individuals to determine whether their pay levels are justified on the basis of these additional factors that are not included in the pay regression.

Recommendations

After the new salary structure has been instituted, PwC recommends that Louisville conduct annual pay equity analyses to ensure that the equity of the new staff pay structure is maintained. The same regression specifications that appear in this report can be used as long as the factors that influence pay at Louisville remain the same. These analyses can be conducted in-house, with assistance supplied by PwC. In the case of new staff, PwC recommends that Louisville institute a review of decisions on salaries for new hires by in-house staff familiar with the pay equity analysis to ensure that these new salaries meet the equity standards.

PwC also recommends that Louisville adopt a plan to enter the results of performance evaluations and information on prior work experience into the electronic employee database in the near future. These factors are important determinants of pay and could have a decisive impact on the understanding of pay differences in future pay equity analyses.

Table 1: Summary Results for Multiple Regression Analyses with Gender Control

<u>Employee Group</u>	<u>Total Employees</u>	<u>Female Employees</u>	<u>Female/Male Salary Disparity</u>	<u>Number of Standard Deviations</u>	<u>R-square</u>	<u>Table for Full Regression Results</u>
Non-exempt	1,535	1,074	-0.6%	-1.17	85.3%	Table 2
Exempt	1,122	746	-0.3%	-0.51	89.3%	Table 3

* Female/Male Salary Disparity statistically significant at the 0.05 level.

Note: Regressions control for employee group and grade, education, years of service, years in grade, weekly hours, and part-time status. Regression is performed on log hourly wage for non-exempt employees, and on log annual salary for exempt employees. Regressions do not control for prior experience or performance.

Note: Female/Male Salary Disparity is derived from the regression coefficient on Gender. The necessary mathematical transformation produces a disparity value that approximately equals the coefficient value itself when the coefficient value is small.

Table 4: Summary Results for Multiple Regression Analyses with Minority Control

<u>Employee Group</u>	<u>Total Employees</u>	<u>Minority Employees</u>	<u>Minority/Non-Minority Salary Disparity</u>	<u>Number of Standard Deviations</u>	<u>R-square</u>	<u>Table for Full Regression Results</u>
Non-exempt	1,535	413	0.0%	0.00	85.3%	Table 5
Exempt	1,122	153	-0.3%	-0.35	89.3%	Table 6

* Minority/Non-Minority Salary Disparity statistically significant at the 0.05 level.

Note: Regressions control for employee group and grade, education, years of service, years in grade, weekly hours, and part-time status. Regression is performed on log hourly wage for non-exempt employees, and on log annual salary for exempt employees. Regressions do not control for prior experience or performance.

Note: Minority/Non-Minority Salary Disparity is calculated from the regression coefficient on Minority. The necessary mathematical transformation produces a disparity value that approximately equals the coefficient value itself when the coefficient value is small.

Table 7: Gender Contrasts for Differences between Proposed Pay and Pay Predicted by Regression

Employee Group	Women					Men				
	Total	Overpaid	Significantly Overpaid	Underpaid	Significantly Underpaid	Total	Overpaid	Significantly Overpaid	Underpaid	Significantly Underpaid
Non-exempt (percent of total)	1,074	427 39.8%	50 4.7%	647 60.2%	1 0.1%	461	186 40.3%	31 6.7%	275 59.7%	2 0.4%
Exempt (percent of total)	746	278 37.3%	29 3.9% *	468 62.7%	0 0.0%	376	150 39.9%	30 8.0%	226 60.1%	2 0.5%

* Percent for Women significantly different from the corresponding percentage for Men at the 0.05 level using a two-sided z-score test.

Note: Regressions control for employee group and grade, education, years of service, years in grade, weekly hours, and part-time status. Regression is performed on log hourly wage for non-exempt employees, and on log annual salary for exempt employees. Regressions do not control for prior experience or performance.

Table 8: Race/Ethnicity Contrasts for Differences between Proposed Pay and Pay Predicted by Regression

Employee Group	Minorities					Non-Minorities				
	Total	Overpaid	Significantly Overpaid	Underpaid	Significantly Underpaid	Total	Overpaid	Significantly Overpaid	Underpaid	Significantly Underpaid
Non-exempt (percent of total)	413	165 40.0%	14 3.4% *	248 60.0%	0 0.0%	1,122	448 39.9%	67 6.0%	674 60.1%	3 0.3%
Exempt (percent of total)	153	49 32.0%	6 3.9%	104 68.0%	0 0.0%	969	379 39.1%	53 5.5%	590 60.9%	2 0.2%

* Percent for Minorities significantly different from the corresponding percentage for Non-Minorities at the 0.05 level using a two-sided z-score test.

Note: Regressions control for employee group and grade, education, years of service, years in grade, weekly hours, and part-time status. Regression is performed on log hourly wage for non-exempt employees, and on log annual salary for exempt employees. Regressions do not control for prior experience or performance.