Summary of Activities for the 2017-2018 Academic Year

The Committee met 5 times during the academic year. In addition, the Chair (Dr. Pyles) and Associate Dean Deanna Caveny-Noecker met with Dr. Jim Posey and staff at the Office of Institutional Research, Planning, and Information Management (IRPIM) several times outside of Committee meetings. In the collective of these meetings and the work that occurred in between, the Committee focused primarily on the following issues:

1. A robust and comprehensive salary analysis process that would calculate and identity salary inequities for all faculty at the College.
2. A more specific study (that was continued from multiple past years) examining the role of gender in salary inequities.
3. A review of our peer institutions and where we stand in relation to a resolution offered in 2013 to increase salary levels to our peer levels.

In the remainder of this document, we will discuss our activities on these issues, including deliverables, conclusions, and remaining issues to be resolved going forward.

Background Prior to the 2017-2018 Committee Activities

Since these issues are all somewhat interrelated, a short background is warranted. The first comprehensive study of faculty salaries that we are aware of was done in 2003 –which is when the development of a peer list of institutions was first created. This study was followed up by similar studies in 2005 and 2008. Further, during the 2012-2013 academic year, the Committee drafted a resolution that was presented to (and passed by) the Faculty Senate in March 2013. This resolution reads:

> College of Charleston faculty salaries will meet or exceed the median salaries of the CUPA-HR salary peers institutionally and at each rank and discipline. The College will make every effort to achieve this goal by September, 2018. The Compensation Committee, in cooperation with all relevant administrative offices, will assess the progress being made in its annual report each spring to the Senate.

As such, each subsequent Committee has monitored progress towards this goal.

More recently, the respective Committees have also focused more specifically on determining whether gender inequities may exist at the College. The 2016-2017 Compensation Committee addressed this issue in the context of a larger analysis of salary inequities overall. After discussing multiple ideas related to the appropriate way to control for issues such as time-in-rank and discipline salary differences, at the end of the 2016-2017 academic year a new method was discovered and championed by the Office of IRPIM. This method, which includes calculating Compa-Ratios, created a launching point for the current academic year and a hopeful way of identifying inequities in salaries related not only to gender, but of any type.
Salary Analysis Proposal

Building upon the discovery of this process of calculating Compa-Ratios, which was discussed in the previous year’s final report, the current committee sought to identify a comprehensive and robust process through which all salaries at the College would be examined not only in relation to peers, but internally as well. During the first meeting, which occurred in early September 2017, the Committee welcomed Jim Posey and Lizmarie Maldonado to discuss this new methodology. Associate Dean Caveny-Noecker, along with Dr. Posey and Ms. Maldonado, presented the logic and calculations behind the Compa-Ratio method. This process controls for discipline-rank-specific salary levels among our peers, as well as time-in-rank at each level. The end result is a ratio of actual salary to expected salary, where any number greater than 1 indicates a positive inequity and any number below 1 indicates a negative inequity. In lieu of a more robust explanation here, a more comprehensive process of calculation is detailed in Appendix A, which is best reviewed following reading of this entire section.

During the initial meeting, as well as the follow-up meetings (in October and December), the Committee unanimously agreed that this process created an opportunity to identify a relative salary level for every faculty at the College of Charleston – both in relation to peers and internally in relation to each other. Following some questions raised between the Committee and the Office of IRPIM on the specifications of the calculations and interpretation thereof, the Committee elected to attempt to produce as complete a process suggestion as possible, agree collectively on the deliverable product, and submit to the Office of IRPIM as a formal recommendation. The end result is the document titled “Proposal for Salary Analysis” included in Appendix A of this document. This was ultimately submitted to the Office of IRPIM for review in January 2018.

Following this, Dr. Pyles and Associate Dean Deanna Caveny-Noecker met with Dr. Posey and staff to review the proposal and examine following steps. At this time, the Office of IRPIM chose to refocus specifically on the issue of gender inequities and not proceed in an analysis of all faculty salary levels in a process that included calculating Compa-Ratios.

Recommendation of Committee Moving Forward

The Committee feels there is still merit in considering a comprehensive, transparent, and recurring analysis of faculty salary levels in a way that removes as much qualitative judgement as possible (although we certainly understand that must be included at some level). We also recognize some of the issues that can be brought up by using methods such as the Compa-Ratio and agree that an examination of as many options for analyses as possible be considered. We also advocate for continued and increased communication and transparency between the Committee and the Office of IRPIM so to eliminate (to the degree possible) work that does not result in activity.

Gender Inequity Study

During the most recent couple of months, the Office of IRPIM has taken a different approach to identifying potential gender inequities on a systematic basis (e.g., answering the question of whether statistical evidence suggests an issue at the College level). Their final report of this analysis included in total in Appendix B, but a summary of the findings are below:

- Evidence does exist of a salary gap, favoring males.
• A significant percentage of this can be explained by differences related to department specific salary levels, rank, and time-in rank. However, a statistically significant gap remains after controlling for these issues.
• The gap is statistically significant (once controlling for the factors mentioned above) at the Professor and Instructor ranks. The gaps documented at the Associate and Assistant Ranks are statistically insignificant when the controls are in place.
• They are careful to note that any inequities, statistically significant or not, may be explained by factors that are not controlled for, including any type of performance measurement.
• They recommend that Deans should review salary inequities through the lens of gender differentials to help determine if salary adjustments are needed.

Recommendation of Committee Moving Forward

The committee applauds the office for working to develop a statistical framework to robustly identify systematic salary inequities. Regarding this macro-level analysis, we suggest attention be carefully given to as many potentially controlling factors as possible. For example, the designation of a “discipline” is often more complicated than would be thought given different treatments of many different specific areas in different schools (even within our peer set). Also, we need to examine issues related to the way compensation is earned and/or awarded at the College. For example, if an individual serves as chair for 5 years, they receive a 1/9th “step-down” salary adjust going forward. Thus, identification of those faculty who have done this should be made and included as a control.

We also recommend that a more granular review be conducted, in a similar fashion to that detailed in the salary study in Appendix A. While the specifics can certainly differ, the documented salary gap favoring males certainly doesn’t exist in the favor or all males or to the detriment of all females. Thus, while it is certainly, and unequivocally, important to study whether a systematic inequity exists, it is our view that such a gap should be then remedied if at all possible on an individual level. We do therefore agree that a careful review of all negative salary inequities as identified in the study of Appendix B is warranted and encourage the progression along that path.

Further, we also suggest that future committees examine any potential underlying causes of gender-based salary inequities that occur at the recruitment and hiring phase. Although perhaps outside the purview of the Committee, we do recommend that processes are in place to assure a diverse and qualified sample pool that is equitably considered. We feel this is likely true at this time at the College, but should be of ongoing concern nonetheless.

Peer Review Analysis

The original list of 20 schools was created in 2003 as part of the first salary study. This list was, and is, only intended to be used for the purpose of salary comparison. During the first three studies (2003, 2005, and 2008), the data was obtained by surveying the schools in question and compiling the data and results in-house. Since that time, the data collection process has evolved so that the College has access to data from two sources (CUPA-HR and IPEDS). During the 2008 salary study, it was realized that there was not a peer group for all departments at the College included among the list, so two additional schools where added. That created a total list of 22
schools at that moment. However, when adding those schools, two others were dropped. Therefore, for the past several years, our 20-school peer list has been as follows:

- Appalachian State University (Boone, NC)
- James Madison University (Harrisonburg, VA)
- Miami University (Oxford, OH)
- Millersville University of Pennsylvania (Millersville, PA)
- Murray State University (Murray, KY)
- Ramapo College of New Jersey (Mahwah, NJ)
- Rowan University (Glassboro, NJ)
- State University of New York College at Geneseo (Geneseo, NY)
- St. Mary’s College of Maryland (Saint Mary’s City, MD)
- The Citadel, the Military College of South Carolina (Charleston, SC)
- The College of New Jersey (Ewing, NJ)
- Truman State University (Kirksville, MO)
- University of New Hampshire (Durham, NH)
- University of North Carolina at Asheville (Asheville, NC)
- University of North Carolina at Greensboro (Greensboro, NC)
- University of North Carolina at Wilmington (Wilmington, NC)
- University of Northern Iowa (Cedar Falls, IA)
- Western Washington University (Bellingham, WA)
- Humboldt State University (Arcata, CA)
- University of Wisconsin-Eau Claire (Eau Claire, WI)

There has been a small amount of confusion in the past related to the addition of the two schools (the last two on the above list) and the subsequent removal of two of the original 20 schools (University of Vermont and the University of Mary Washington), but the above list is the Committee’s understanding of the current comparison group.

Given the time that has passed since the list was created, the Committee also felt it appropriate to do at least a cursory examination of the characteristics of the sample to see if it still seems to be a relevant comparison sample. The original report states that the following was used to identify the sample:

- Status as public institution
- SAT scores
- Size of student body
- Student-faculty ratio
- Percentage of faculty with terminal degree

To this, we added the Cost of Living Factor, as there is concern regarding salary levels in relation to the expense of living in the Universities’ cities. Appendix C shows the results of surface level statistics related to these variables for CofC and the peer group. It should be noted that at the time of data collection, there was still a bit of uncertainty regarding the 2 schools that were
removed, thus the sample in Appendix A still includes those as well. Some surface level observations include:

1. By-in-large, the sample does still appear to be relevant for comparison purposes – particularly related to the variables that were originally used to create the sample.
2. The cost of living index does put CofC among the most expensive among the sample, and is something to be considered. It costs nearly 8% more than the median (and over 10% more than the average) to live in Charleston as compared to the peer sample. We are ranked comfortably in the top quartile of the peer group in cost of living. It should be noted that studies of this nature are always difficult because people don’t necessarily live specifically in the city of the University.

**Recommendation of Committee Moving Forward**

The Committee recommends periodic review of the peer sample list, particularly if the College shifts dramatically in any definable way. The same should be true of any significant shifts in any of the peer institutions. The Committee feels the determination and consistently of a quality and relevant peer list of schools is among the most critical elements in any salary analysis. Finally, the Committee recommends that statistics beyond surface level (i.e, mean, median, etc.) be examined so that potential outliers be removed if they create a biasing affect.

Thus, we see no great alarm in the peer group being used, but feel careful and periodic review is important. Further, the issue of cost of living should be addressed as comprehensively as possible in creating and interpreting peer salary data.

**Salary Levels in Relation to Peers**

Each spring, salary data becomes available from the two sources mentioned earlier (HUPA-HR and IPEDS). The CUPA-HR data has breakdown at the department rank level, while the IPEDS data is only at the rank level. On the other hand, all peer schools report the IPEDSs data, which creates a strong sample. The Office of IRPIM updates our standing in relation to peers near the end of each spring semester using the IPEDS data – and the most recent update is included in Appendix D.

This creates a rudimentary-level ability to gauge where we stand in relation to the salary resolution of 2013. On the surface level, it does appear as though significant improvements have been made. In fact, the average salary overall is virtually identical to the peer average. This includes all ranks, of course. When examining each rank, we see this is a product of two ranks (Assistant and Instructors) advancing beyond the peer average, while the other two (Associate and Full) still lagging.

It is important to note the disparity between these numerical data and the specifics of the resolution. First, it is our understanding that the resolution specified *median* salaries at all discipline-ranks be at or above the peer average. Further, in order to truly determine progress, more advanced sample distribution properties must be examined (beginning with standard deviation values). Nonetheless, it is a positive to see the mean values trending upward, both absolutely and in relation to peers.
Recommendation of Committee Moving Forward

The Committee recommends a much deeper analysis of the salary data, again via a process similar to that in the document in Appendix A, which can be truly applied to the resolution. We should determine which department-ranks are still lagging their peers and see if an adjustment can and/or should be made. Further, in analysis of data, the Committee recommends to future committees that a more thorough data analysis be completed that includes more than just first moment statistics. Finally, there is obvious issue that as one progresses further through their career (at the Associate and Full levels), lags in relation to peer salary levels intensify. This indicates a level of salary compression that is in excess of peers and should be a topic of continued examination. Possible solutions would include examining the level of salary increases at promotion and tenure increments – particularly in relation to the same for our peer schools.

Other Issues

Several times throughout the year, the current Committee mentioned a needed examination of the current structure of Adjunct pay, but failed to actually make any progress. Nonetheless, we do feel that the issue of fairly compensating adjunct faculty should be an issue at the forefront going forward. Working with the newly formed Adjust Faculty Committee would be a necessary and beneficial notion going into coming years.

2017-2018 Compensation Committee

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Proposal for Salary Analysis

Submitted By: The Faculty Compensation Committee

January 2018

INTRODUCTION:

The issue of compensation is an ever-present and critically important component of an operating entity – and the College of Charleston is no exception. Specifically, there is an ongoing concern over salary inequities among faculty at the College of Charleston. These inequities could be specifically located within faculty demographics (e.g. gender) or ranks (e.g., Professors). The Compensation Committee ("Committee") ideally wishes to identify a robust process through which the base salary for all faculty at the College of Charleston can be analyzed, inequities identified, and ultimately corrected.

Further, a second objective is to identify faculty that are underpaid in relation to their peer-driven market valuation. Given the nature of the higher education academic profession, where a significant number of employees remain at the College for a significant portion (or the entirety) of their professional career, it is not unusual for certain salaries to get out of line with equitable market valuation in relation to comparable peers at other institutions. However, the Committee feels that efforts should be made to reward meritorious faculty and retain their talents on a continual basis.

Salary adjustments have been largely made in uniform fashion and in the nature of across the board raises. There have been – within the past decade – two instances of merit and/or market-based adjustments. However, rarely have faculty had an avenue through which they can be systematically identified as being compensated below colleague or market value. More importantly, there exists a need for a transparent, consistent, and viable process through which clearly identified salary inequities can be corrected.

As an important note, this document and the outlined process concern only 9-month appointments and associated compensation and not any other compensation. Further, this process is completely separate from any type of across-the-board salary adjustments.

STEP 1: PEER GROUP IDENTIFICATION

History of Peer Identification:

In 2003, an Ad Hoc Faculty Compensation Committee was created (which was the precursor to the permanent committee) to analyze salaries relative to peer institutions. From this, a Faculty Salary Study was completed in 2003, 2005, and 2008. The peer group is not intended to be used for any purpose other than salary analysis. Five parameters were used in identifying 20 schools as our peer group for this purpose:

- Status as public institution
- SAT scores
- Size of student body
- Student-faculty ratio
- Percentage of faculty with terminal degree
Also considered were institutional mission and specific stratified sample considerations (Council of Public Liberal Arts Colleges, the athletic conference (Southern at the time), South Carolina senior colleges and universities, and comparable schools ranked by *US News & World Report*).

From this, the original 2003 list of 20 schools was:

- Appalachian State University (Boone, NC)
- James Madison University (Harrisonburg, VA)
- Miami University (Oxford, OH)
- Millersville University of Pennsylvania (Millersville, PA)
- Murray State University (Murray, KY)
- Ramapo College of New Jersey (Mahwah, NJ)
- Rowan University (Glassboro, NJ)
- State University of New York College at Geneseo (Geneseo, NY)
- St. Mary’s College of Maryland (Saint Mary’s City, MD)
- The Citadel, the Military College of South Carolina (Charleston, SC)
- The College of New Jersey (Ewing, NJ)
- Truman State University (Kirksville, MO)
- The University of Mary Washington (Fredricksburg, VA)
- University of New Hampshire (Durham, NH)
- University of North Carolina at Asheville (Asheville, NC)
- University of North Carolina at Greensboro (Greensboro, NC)
- University of North Carolina at Wilmington (Wilmington, NC)
- University of Northern Iowa (Cedar Falls, IA)
- University of Vermont (Burlington, VT)
- Western Washington University (Bellingham, WA)

In addition, two schools were added to the list in 2008 for the purpose of creating a comparison sample for the discipline of Geology.

- Humboldt State University (Arcata, CA)
- University of Wisconsin-Eau Claire (Eau Claire, WI)

Since 2008, this list has been used in any analysis revolving around Faculty Compensation metrics at CofC.

*Going Forward:*  
The selection of a peer group is arguably the most critical component of any faculty study, thus both the criteria and specific selections of this group must be evaluated each time prior to salary analysis. Further concerns include consideration of a cost of living factor and the fact that we have now moved to a new athletic conference since the peer group was created. While there will clearly remain a significant element of judgement of which schools to include, metrics used in analysis should be clearly identified and justified. Further, the comprehensive list of schools should be regularly examined by the Compensation Committee, particularly if a formal process is approved through which these peers are used in measuring salary inequities.
STEP 2: QUANTITATIVE SALARY ANALYSIS

Previous salary studies (2003, 2005, and 2008) were completed with data collected from surveying the peer schools. Now, we can use data from The College and University Professional Association for Human Resources (CUPA-HR). CUPA-HR provides leadership on higher education workplace issues in the U.S. and abroad. They monitor trends, explore emerging workforce issues, conduct research, and promote strategic decisions among college and universities. Salary reports are completed annually. Data is broken into discipline-rank and can be pulled for the sample of peer schools selected in Step 1. Rank is measured as Professor, Associate Professor, Assistant Professor, New Assistant Professor, and Instructor.

The office of Institutional Research, Planning, and Information Management (IRPIM) will quantitatively measure negative salary gap in two ways:

- Among CofC Faculty
- In relation to peer market levels

An important note is that submission of the data to CUPA-HR is voluntary and it is unlikely that all peers will participate.

2. A Calculation of Compa-Ratios for Internal Analysis

A Compa-Ratio provides a method for comparing faculty salaries within an institution regardless of rank, discipline, or experience. The first step is to calculate an expected salary for each faculty member. Since faculty salaries vary by rank, discipline, and experience, these factors must be accounted for when comparing salary data. Further, CofC salaries within disciplines (and overall) may vary in systematic ways from those of the peer group. A time-in-rank factor and an institution-specific salary level adjustment are developed to account for these latter variations.

These three elements, merged together, create an expected salary level:

\[ ESI = MB_{D,R} \times TIRFactor_{R} \times CofCFactor_{D,R} \]

Definitions of the variables are as follows:

- \( ESI \) is the expected salary for each respective faculty member to be used in internal analysis for only CofC faculty members.
- \( MB_{D,R} \) is the market base salary at the discipline-rank level. Specifically, it is the median salary level among our reporting peers at a specific 2-Digit CIP code and rank. For example, this would be the median level of salary for Assistant Professors in general Economics (CIP code 45). For illustrative purposes, suppose that is $80,000.
- \( TIRFactor_{R} \) is the time in rank factor to account for systematic differences in salary based upon the number of years in rank. The expectation is that newly promoted faculty would be paid less than those that have been in that rank for several years. Ideally, this factor would be based upon a regression analysis of individual salary data. While we have this data available for CofC faculty, we do not have data at a faculty-level for CofC peers. Thus, there will likely be a subjective element in this process. For reference, the following factors were used in a similar study completed at Washington and Lee University in 2011.
To continue the illustrative example, suppose we are analyzing the expected salary of an Assistant Professor of Economics that has 1 year in rank – the time in rank factor is .875. Given this, an Assistant Professor in Economics should be paid (.875 * $80,000), or $70,000 based upon the peer-based market rate.

\[ ES_i = \text{CofCFactor}_{D,R} \times \text{CofCMedSal}_{D,R} \]

\[ = .875 \times 85,000 = 74,375 \]

A careful review of the above process reveals a simple mathematical simplification where the market median-rank salary cancels out. Thus, in simpler form:

\[ ES_i = TIRFactor_R \times \text{CofCMedSal}_{D,R} \]

\[ = .875 \times 85,000 = 74,375 \]

Thus, the market base impact is removed from this formula all together – which is ultimately the point of this first exercise. The intent is to identify discrepancies among similar faculty only at the College of Charleston that cannot be explained by time in rank or discipline.

Once the expected salary is calculated, the Compa-Ratio is then calculated as:

\[ \text{Compa-Ratio} = \frac{\text{Actual Salary}}{ES_i} \]
So, if the fictional professor referenced above makes $78,000, they would be assigned a Compa-Ratio of 1.05 ($78,000 / $74,375). Any value greater than 1.00 indicates an overpayment in relation to expectation, while any value less than 1.00 indicates underpayment. More important, in comparing internal salary data at CofC, the Compa-Ratios can be used to identify negative salary gaps across all discipline-ranks and can also be used to assess potential pay disparity in relation to other demographics (e.g., gender).

2B Calculation of Market-Based Ratios for External Comparison

To identify salary gaps between CofC faculty salaries and market-based levels, the Expected Salary can simply be truncated to remove the third factor – the CofC-Specific Adjustment. Thus, the expected salary for external comparison would be:

\[ E_{SE} = MB_{D,R} \times TIR_{Factor_R} \]

In our previous example, the median salary for an Assistant Professor of Economics was made up to be $80,000, and the time-in-rank factor for one year of experience was .875. Thus, the Market-Based Expected Salary would then be calculated as $80,000 * .875 = $70,000, as before. Likewise, we can then calculate the Market-Based Ratio as:

\[ \text{Market-Based Ratio} = \frac{\text{Actual Salary}}{E_{SE}} \]

Thus, in this case, the professor in question would have a Market-Based Ratio of $78,000 / $70,000 = 1.11, indicating the professor is paid 11% more than a comparable faculty member at the median in the peer-based market.

It is important that this process be carried out for every tenured or tenure track faculty and instructors with the end result being a Compa-Ratio and Market-Based Ratio for each faculty member. There are likely to be difficulties in this process, a few of which are listed below:

1. CUPA-HR data includes that for instructors, but does not segment by senior instructor. This must be remedied to some degree since there are significant differences between the two. Additionally, the use of instructors varies across institutions, with many using the instructor as a visiting-only position, rather than a term-based position.
2. It is uncertain if CUPA-HR data includes that for librarians.
3. The analysis is being done at the 2-Digit CIP level, which may be too broad in some cases and too narrow in others.

Further, in the interest of transparency, the Committee feels that each faculty member should be made aware that the process is taking place and be made aware of their specific salary analysis in some way. A sustained concern among faculty at any institution is a lack of transparency in salary determinations. As such, a crucial part of this process would be to make each faculty member aware of their standing in relation to their CofC colleagues, as well as their market level each time the predefined ratios are calculated for the faculty at large. A process should be identified through
which the information can be conveyed securely to each faculty member. Potentially viable options include as an additional piece of information in the annual salary letter or uploaded within MyCharleston.

STEP 3: ANALYSIS OF SALARY RATIOS

Once the Compa-Ratios and Market-Based Ratios are calculated, analysis will be done on the results.

3A Identification of Underpaid Faculty

The trigger point for a negative salary gap could be identified as more than 5% below the relative expected salary. Put differently, a Compa-Ratio or Market-Based Ratio of less than 95 could be used to indicate a negative salary gap. Three separate lists could be identified:

Group 1: Faculty with Compa-Ratios less than 95, indicating inequity relative to CofC faculty of similar standing, but with Market-Based Ratios in excess of 95.

Group 2: Faculty with Market-Based Ratios less than 95, indicating salaries below the market level as determined by the peer group, but with Compa-Ratios in excess of 95.

Group 3: Faculty with both ratios less than 95.

3B Identification of Systematic Salary Inequities

The Compensation Committee recognizes that a primary objective of a salary study of this nature could be to identify salary inequities among CofC. This would allow identification of faculty members of similar discipline-rank that are paid differently. In using the Ratios, concerns from discipline, rank, or time-in-rank effects have been taken into account – thus an analysis can now focus on other issues, including gender, race, or any number of demographic variables. The Committee recommends that Compa-Ratios and Market-Based Ratios be statistically and econometrically compared to identify any discrepancies.
Appendix B: Gender Equity Study from the Office of IRPIM
2017 Faculty Compensation Study

Executive Summary

The purpose of this study is to examine any association between faculty salaries and gender after controlling for available factors. The study focused on internal faculty salary comparisons and not on peer comparisons. The Office of Institutional Research and Planning (IRP) obtained base salaries from the College of Charleston systems for roster faculty, excluding visiting faculty, at the College of Charleston for the 2017-2018 academic year. This study examined how faculty salaries are related to department, discipline, rank, and years in rank and whether gender is associated after controlling for these factors. The results of this study will assist the College in reviewing its policies that may influence salary determination. The findings, however, do not support causal claims.

Limitations

Department, discipline, rank, current chair status where applicable, and years in rank were the only explanatory variables available at the time of the study. A major limitation of this study is availability of other explanatory variables. IRP did not have access to individual performance measures including publications, research funding and activities, professional awards, work experience prior to the College, bonuses due to prior chair appointments, teaching or annual performance evaluations, and receipt of outside offers at time of hiring. These factors can influence faculty salaries at the individual level. As a result, this study is unable to determine the cause of any observed gender salary inequities as a perceived gap in salary may be due to other variables.

Results

All Roster Faculty

- The average wage gap of $8,669.01, favoring male faculty, represents the difference between the average salaries of 278 male faculty and 210 female faculty at the College of Charleston. This represents the raw average difference, without controlling for any available factors, and is statistically significant at the 0.05 level.
- A mixed-effects regression model controlling for differences in department (including single-gender departments), rank and years in rank, eliminates much of the observed salary disparity between male and female faculty. These factors explain $5,726.27 or 66% of the overall raw average wage gap. The unexplained wage gap of $2,942.74, 95% CI [$1,238.84, $4,646.65], favoring males, may be explained by factors not included in this study. This remaining wage gap is statistically significant at the 0.05 level. The same model controlling for discipline rather than department found similar results.
- After fitting individual regression models to each rank and controlling for years in rank and discipline, which includes single-gender departments, there is a statistically significant difference at the professor and senior instructor/instructor ranks.
Professor

- The raw average wage gap between 95 male and 58 female professors is $4,872.37, favoring males. This wage gap is not statistically significant at the 0.05 level of significance.
- A regression model suggests that discipline, years in rank and current chair status explain about 9% of this wage gap. The remaining wage gap of to $4,421.81, favoring males, is statistically significant and may be explained by factors not included in this study.

Associate Professor

- The raw average wage gap between 102 male and 71 female associate professors is $5,888.22, favoring males, and is statistically significant.
- A regression model suggests single-gender departments account for 72% of this wage gap. The remaining wage gap of $1,653.26, favoring males, is not statistically significant. Although not statistically significant, the remaining wage gap may be explained by factors not included in this study.

Assistant Professor

- The raw average wage gap between 62 male and 53 female assistant professors is $9,518.72, favoring males, and is statistically significant.
- A regression model suggests that discipline, including single-gender departments, and years in rank, account for 90% of this average wage gap. The remaining wage gap of $911.97, favoring males, is not statistically significant. Although not statistically significant, the remaining wage gap may be explained by factors not included in this study.

Senior Instructor/Instructor

- There are a combined 19 male and 28 female senior instructors and instructors with a raw average wage gap of $4,511.83, favoring males. This wage gap is statistically significant at the 0.10 level of significance, but not the 0.05 level.
- A regression model suggests discipline and years in rank account for about 28% of this wage gap. The remaining wage gap of $3,234.62, favoring males, is statistically significant at the 0.05 level. The remaining wage gap may be explained by factors not included in this study.

Recommendations

IRP recommends further review of individual faculty salaries by deans that incorporates the measures of productivity not included in this study to determine whether salary adjustments should occur in individual cases.
Methodology

Stage 1: Exploratory Analysis

- Average faculty salary differences were calculated for gender comparison:
  - Across all faculty and departments
  - By rank
  - By department
  - By department and rank
- Departments at each rank were further analyzed at the following levels:
  - Average female salaries were lower
  - Average male salaries were lower
  - Average salaries were equal
  - Female only and male only departments
  - Adjusting for male only and female only departments
- A 2-sample t-test for equal means was performed to determine statistically significant average salary differences at both the 0.05 and 0.10 levels

Stage 2: Regression Modeling

A) Overall Model

Several regression-modeling techniques were performed to control for inherent salary variations across disciplines or departments, rank and years in rank. These include:
1. Fixed-Effects Regression Model
2. Clustering Standard Errors
   a. By discipline (or department)
   b. By discipline (or department) and rank
3. Mixed-Effects Regression Model
   a. Discipline (or department) and rank are random effects
   b. Gender and years in rank are fixed-effects

In the models controlling for department, faculty in the Accounting and Legal Studies department were divided into two sub-departments to accurately reflect pay differences: Accounting; Legal Studies.

B) Rank-Level Analysis: Single-Equation Method for Measuring the Unexplained Wage Gap

Toutkoushian and Kramer II in The Handbook of Institutional Research proposed a method of distributing the total wage gap between two groups into an unexplained and explained wage gap. Total wage gap is defined as the difference in average salaries between males ($m$) and females ($f$).

\[ \text{Total Wage Gap} = \bar{Y}_m - \bar{Y}_f \]
Faculty salaries may be affected by several factors, which are denoted by $X$. If such factors are correlated with gender, then a portion of the total wage gap might reflect these factors and not gender. This portion is referred to as the “explained wage gap” and any remaining difference is the “unexplained wage gap”.

(2) Total Wage Gap = Explained Wage Gap + Unexplained Wage Gap

In a linear regression model with gender as the only independent variable and salary as dependent variable, the slope of gender is equivalent to the total wage gap. The coefficients, $\beta$, for any additional factors represent the impact of each factor $X$, given the effects of all other variables in the model remain constant. The general equation expressing a faculty member’s salary as a function of a set of factors is:

(3) $Y_i = \alpha + X_i \beta + G \gamma + u_i$

Where $Y$ is faculty salary, $X$ is the set of factors other than gender, $i$ is the individual faculty member, $\alpha$ is the intercept of the linear regression line, $\beta$ is the set of slope coefficients for the regression line, $G$ represents gender and $\gamma$ is the estimated pay difference between male and female salaries (unexplained wage gap), and $u$ is the random error term. This model allows for a direct test of pay difference between males and females. Factors considered for this stage of the analysis were years in rank, current chair status for corresponding ranks, and discipline (departments were grouped at the 2-digit Classification of Instructional Programs (CIP) level). Regression models were fit by individual ranks to allow flexibility in model building for each rank.

**Stage 3: Residual Analysis**

- The mixed-effects regression model controlling for years in rank with department and rank as random effects was run by excluding gender from the model in order to examine residuals for individual faculty members without a gender bias.
- Residual values were calculated by taking the difference between actual salary and predicted salary. Residuals from this model represent the variation in salary not explained by years in rank, rank and department.
- Residuals for individual faculty members were reported by department for further review by deans.
Conclusions

Stage 1: Exploratory Analysis

**Overall Analysis**

- Faculty wage gap partially explained by hiring imbalance, gender pay inequities and/or other factors.
- The average wage gap $8,669.01, favoring male faculty, represents the difference between the average salaries of 278 male faculty and 210 female faculty at the College of Charleston. This represents the raw average difference, without controlling for any available factors, and is statistically significant at the 0.05 level.
- Average salary differences favor males across each rank, but a t-test for group means found statistically significant differences at the assistant professor and associate professor ranks.

**Department-Level Analysis**

- Averages by department and gender were tested for statistical significance using a t-test of group means:
  - 10 departments with a lower average male salary across all ranks
  - 24 departments with a lower average female salary across all ranks
  - 1 department with only male faculty across all ranks (Hospitality & Tourism Management – total of 7 faculty)
  - 2 departments with only female faculty across all ranks (Public Health; Women’s and Gender Studies – total of 2 faculty)
  - Statistically significant differences at the 0.05 level in the Biology and Sociology & Anthropology departments
  - Statistically significant differences at the 0.10 level in the Geology & Envt’l Geosciences and Mathematics departments
  - Some department faculty sizes were too small to test for statistically significant differences

**Rank-Level Analysis**

- Averages by rank and gender were tested for statistical significance using a t-test for group means.

**Professor**

- There is an average wage gap of $4,872.37, favoring males, and is not statistically significant.
- When excluding single-gender departments, this gap increases to $7,382.03, favoring males, and is statistically significant at the 0.05 level.
**Associate Professor**

- There is an average wage gap of $5,888.21, favoring males, and is statistically significant at the 0.05 level.
- When excluding single-gender departments, this gap reduces to $1,653.26, favoring males, and is not statistically significant.

**Assistant Professor**

- There is an average wage gap of $9,518.72, favoring males, and is statistically significant at the 0.05 level.
- When excluding single-gender departments, this gap reduces to $6,033.39 and is not statistically significant.

**Senior Instructor**

- There is an average wage gap of $4,576.62, favoring males and is not statistically significant.
- When excluding single-gender departments, this gap increases to $4,949 and is not statistically significant.

**Instructor**

- There is an average wage gap of $5,467.98, favoring males and is not statistically significant.
- When excluding single-gender departments, the gap becomes $2,686, favoring females and is not statistically significant.

**Stage 2: Regression Modeling**

**A) Overall Model**

- After examining various modeling techniques, each designed to account for differences in salaries across disciplines or departments, rank and years in rank, IRP found that the techniques yielded similar results. IRP selected the mixed-effects regression model controlling for years and rank with department and rank as random effects. This technique adequately addresses salary differences across these factors. Table 1 shows model results using all regression techniques performed. Model estimates for all levels of departments and rank were not printed for simplicity.
- The mixed-effects model estimates an average wage gap between male and female faculty of $2,942.74, 95% CI [$1,238.84, $4,646.65], favoring males, and is statistically significant at the 0.05 level.
- This average wage gap represents the unexplained wage gap after controlling for salary differences due to years in rank, department and rank. Controlling for these factors eliminates much of the observed salary disparity between male and female faculty. The unexplained wage gap may be explained by factors not included in this study in addition to gender inequities.
B) **Rank-Level Analysis: Single-Equation Method for Measuring the Unexplained Wage Gap**

- To further estimate the gender effect by rank, various regression models were tested at each individual rank. Model results with the most significant impact on the gender effect are presented in Table 2. Model estimates for all factors included in the model were not printed for simplicity.

**Professor**

- There are 95 male and 58 female professors with an average wage gap of $4,872.37, favoring males, and is not statistically significant. Years in rank, current chair status and discipline explain about 9% of this wage gap, reducing the unexplained wage gap to $4,421.81, which is statistically significant at the 0.10 level. This unexplained wage gap may be attributable to factors not included in this study in addition to gender.
- The single-gender departments have an average wage gap of $17,700, favoring females. Therefore, excluding faculty in single-gender departments creates a $7,382.03 average wage gap, favoring males, and is statistically significant.
- Years in rank, current chair status, and discipline explain about 22% of the wage gap excluding single-gender departments. The unexplained wage gap reduces to $5,723.69, favoring males, is statistically significant suggesting this difference may be explained by factors not included in this study, in addition to gender inequities.

**Associate Professor**

- There are 102 male and 71 female associate professors with an average wage gap of $5,888.22, favoring males, and is statistically significant.
- Single-gender departments account for 72% of this wage gap. The unexplained wage gap becomes $1,653.26, favoring males, and is not statistically significant. Although not statistically significant, this unexplained wage gap may be attributable to factors not included in this study in addition to gender inequities.

**Assistant Professor**

- There are 62 male and 53 female assistant professors with an average wage gap of $9,518.72, favoring males, and is statistically significant.
- Years in rank and discipline, part of which includes single-gender departments, account for 90% of this average wage gap. The unexplained wage gap after controlling for these factors becomes $911.97, favoring males, and is not statistically significant. Although not statistically significant, the remaining unexplained wage gap may be attributable to factors not included in this study in addition to gender inequities.
Senior Instructor/Instructor

- Senior instructor and instructor ranks were combined in this analysis to improve model validity.
- There are a combined 19 male and 28 female senior instructors and instructors with an average wage gap of $4,511.83, favoring males, which is statistically significant at the 0.10 level of significance, but not the 0.05 level.
- Years in rank and discipline, which includes single-gender departments, account for about 28% of this wage gap. The remaining unexplained wage gap of $3,234.62, favoring males, is statistically significant at the 0.05 level suggesting this difference may be explained by factors not included in this study in addition to gender inequities.
## Table 1. Overall Model Comparison by Regression Technique

<table>
<thead>
<tr>
<th>Regression Results</th>
<th>Fixed-Effects Model</th>
<th>Clustering Standard Errors by Department and Rank</th>
<th>Mixed-Effects Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>95% CI:</td>
</tr>
<tr>
<td>Intercept</td>
<td>$63,222.56</td>
<td>$2,003.92</td>
<td>[$59,284.20, $67,160.91]</td>
</tr>
<tr>
<td>Gender (Female)</td>
<td>-$2,307.96</td>
<td>$885.51</td>
<td>[-$4,048.27, -$567.65]</td>
</tr>
<tr>
<td>Years in Rank</td>
<td>$529.19</td>
<td>$77.51</td>
<td>[$376.86, $681.52]</td>
</tr>
<tr>
<td>Model Fit Statistics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QIC</td>
<td>0.85</td>
<td></td>
<td></td>
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<tr>
<td>AIC</td>
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</tbody>
</table>

## Table 2. Single-Equation Method for Measuring the Unexplained Wage Gap by Rank

<table>
<thead>
<tr>
<th>Regression Results</th>
<th>Professor (N=153)</th>
<th>Associate Professor (N=173)</th>
<th>Assistant Professor (N=115)</th>
<th>Senior Instructor + Instructor (N=47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>95% CI:</td>
<td>p-value</td>
</tr>
<tr>
<td>Intercept</td>
<td>$59,908.00</td>
<td>$3,816.86</td>
<td>$[52,359, $67,457]</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Gender (Female)</td>
<td>-$4,421.81</td>
<td>$2,341.13</td>
<td>[-$9,051.85, $208.23]</td>
<td>0.0611</td>
</tr>
<tr>
<td>Years in Rank</td>
<td>$850.70</td>
<td>$169.51</td>
<td>[$515.47, $1,185.94]</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Model Fit Statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.67</td>
<td></td>
<td>0.23</td>
<td>0.88</td>
</tr>
</tbody>
</table>
Stage 3: Residual Analysis

- A plot of actual salary versus predicted salary (Figure 1) suggests a fairly predictive model overall, with increasing variability, particularly among faculty with a salary above $90,000.
- The same plot by rank (Figure 2) suggests much of the deviation from the model results occurs at the professor rank.
- The residual plot (Figure 3) also shows much of the variation occurring in the higher salary ranges with some individual faculty well above or below the predicted salaries.
- While years in rank, rank and department are strong predictors of faculty salary, these factors do not explain all variations within salary. Hence, the need for further review at the individual faculty level by deans that incorporates the measures of productivity not included in this study to determine whether salary adjustments should occur in individual cases.

Figure 1. Actual Salary versus Predicted Salary by Gender
Figure 2. Actual Salary versus Predicted Salary by Rank

Figure 3. Residual Plot (Residuals versus Predicted Salary)
Appendix C: Peer School Characteristics Review
Salary Peer Group Analysis

College of Charleston Compensation Committee
Criteria

- Status as public institution
- SAT scores
- Size of student body
- Student-faculty ratio
- Percentage of faculty with terminal degree

- Cost of Living Index
Peer Group

- Appalachian State University (Boone, NC)
- James Madison University (Harrisonburg, VA)
- Miami University (Oxford, OH)
- Millersville University of Pennsylvania (Millersville, PA)
- Murray State University (Murray, KY)
- Ramapo College of New Jersey (Mahwah, NJ)
- Rowan University (Glassboro, NJ)
- State University of New York College at Geneseo (Geneseo, NY)
- St. Mary’s College of Maryland (Saint Mary’s City, MD)
- The Citadel, the Military College of South Carolina (Charleston, SC)
- The College of New Jersey (Ewing, NJ)
- Truman State University (Kirksville, MO)
- The University of Mary Washington (Fredricksburg, VA)
- University of New Hampshire (Durham, NH)
- University of North Carolina at Asheville (Asheville, NC)
- University of North Carolina at Greensboro (Greensboro, NC)
- University of North Carolina at Wilmington (Wilmington, NC)
- University of Northern Iowa (Cedar Falls, IA)
- University of Vermont (Burlington, VT)
- Western Washington University (Bellingham, WA)
- Humboldt State University (Arcata, CA)
- University of Wisconsin-Eau Claire (Eau Claire, WI)
SAT Scores

Average SAT Scores

Mean: 1163
Median: 1170
CofC Rank: 11/23
Size of Student Body

Mean: 11,048  Median: 10,562  CoC Rank: 13/23
Student-Faculty Ratio

Mean: 17  
Median: 17  
CofC Rank: 7/23
Percentage of Faculty with Terminal Degree

Mean: 88%
Median: 89%
CofC Rank: 7/23
Cost of Living Index

Mean: 107.23
Median: 104.35
CofC Rank: 18/23
Appendix D: IPEDS Salary Comparison Update 2017-2018
Eight Year Trend of Comparing College of Charleston Average Salary of Full Time Instructional Faculty to Other Institutions:

Average Salary of Full-Time Instructional Faculty (All Ranks) of All Comparison Institutions Compared to College of Charleston

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Average Salary: All Ranks</td>
<td>$72,596</td>
<td>$73,549</td>
<td>$74,235</td>
<td>$72,828</td>
<td>$73,735</td>
<td>$74,823</td>
<td>$76,220</td>
<td>$77,169</td>
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<tr>
<td>College of Charleston</td>
<td>$64,707</td>
<td>$64,679</td>
<td>$65,965</td>
<td>$68,805</td>
<td>$69,723</td>
<td>$73,638</td>
<td>$74,565</td>
<td>$77,145</td>
</tr>
</tbody>
</table>

Source: IPEDS, 2009-10 to 2016-17, Human Resources Survey

Created April 20th, 2018
Eight Year Trend of Comparing College of Charleston Average Salary of Full Time Instructional Faculty to Other Institutions:
Average Salary of Full-Time Instructional Faculty (Associate Professors) of All Comparison Institutions Compared to College of Charleston

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Average Salary: Associate Professors</td>
<td>$72,301</td>
<td>$73,049</td>
<td>$73,383</td>
<td>$72,205</td>
<td>$73,494</td>
<td>$74,841</td>
<td>$76,363</td>
<td>$77,826</td>
</tr>
<tr>
<td>College of Charleston</td>
<td>$64,988</td>
<td>$63,927</td>
<td>$65,022</td>
<td>$68,778</td>
<td>$68,580</td>
<td>$73,071</td>
<td>$73,278</td>
<td>$75,200</td>
</tr>
</tbody>
</table>

Source: IPEDS, 2009-10 to 2016-17, Human Resources Survey    
Created April 20th, 2018
Eight Year Trend of Comparing College of Charleston Average Salary of Full Time Instructional Faculty to Other Institutions:
Average Salary of Full-Time Instructional Faculty (Instructors) of All Comparison Institutions Compared to College of Charleston

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Average Salary: Instructors</td>
<td>$51,098</td>
<td>$51,557</td>
<td>$52,094</td>
<td>$53,974</td>
<td>$54,689</td>
<td>$51,517</td>
<td>$52,414</td>
<td>$53,129</td>
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<tr>
<td>College of Charleston</td>
<td>$46,282</td>
<td>$47,795</td>
<td>$49,223</td>
<td>$51,372</td>
<td>$54,684</td>
<td>$54,738</td>
<td>$55,008</td>
<td>$57,583</td>
</tr>
</tbody>
</table>

Source: IPEDS, 2009-10 to 2016-17, Human Resources Survey  
Created April 20th, 2018
Eight Year Trend of Comparing College of Charleston Average Salary of Full Time Instructional Faculty to Other Institutions:
Average Salary of Full-Time Instructional Faculty (Professors) of All Comparison Institutions Compared to College of Charleston

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Average Salary: Professors</td>
<td>$93,017</td>
<td>$93,891</td>
<td>$94,589</td>
<td>$91,724</td>
<td>$93,503</td>
<td>$94,523</td>
<td>$96,174</td>
<td>$97,677</td>
</tr>
<tr>
<td>College of Charleston</td>
<td>$81,225</td>
<td>$81,074</td>
<td>$82,328</td>
<td>$86,373</td>
<td>$86,823</td>
<td>$92,205</td>
<td>$92,565</td>
<td>$94,166</td>
</tr>
</tbody>
</table>

Source: IPEDS, 2009-10 to 2016-17, Human Resources Survey
Created April 20th, 2018
Eight Year Trend of Comparing College of Charleston Average Salary of Full Time Instructional Faculty to Other Institutions:

Average Salary of Full-Time Instructional Faculty (Assistant Professors) of All Comparison Institutions Compared to College of Charleston

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Salary: Assistant Professors</th>
<th>College of Charleston</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-10</td>
<td>$59,870</td>
<td>$58,388</td>
</tr>
<tr>
<td>2010-11</td>
<td>$61,167</td>
<td>$59,190</td>
</tr>
<tr>
<td>2011-12</td>
<td>$61,890</td>
<td>$59,060</td>
</tr>
<tr>
<td>2012-13</td>
<td>$62,169</td>
<td>$60,111</td>
</tr>
<tr>
<td>2013-14</td>
<td>$63,190</td>
<td>$61,326</td>
</tr>
<tr>
<td>2014-15</td>
<td>$64,222</td>
<td>$65,151</td>
</tr>
<tr>
<td>2015-16</td>
<td>$65,855</td>
<td>$65,790</td>
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<tr>
<td>2016-17</td>
<td>$67,560</td>
<td>$68,741</td>
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</table>

Source: IPEDS, 2009-10 to 2016-17, Human Resources Survey

Created April 20th, 2018