

Senate Committee on the Economic Status of the Faculty
Fiscal Year 2018
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Senate Committee on the Economic Status of the Faculty

I. Introduction

The Senate Committee on the Economic Status of the Faculty (SCESF) is charged by the “Rules of the Faculty Senate” to:

- Gather and organize data on faculty salaries and benefits;
- Issue an annual report on the economic status of the faculty; and
- Represent the faculty in the determination of University policy on salary issues.

The focus of this report is the current economic status of the faculty, based on salary and benefits data provided to the committee by Provost’s Office, prepared by the Offices of Institutional Research & Analysis and Human Resources. The data as provided to SCESF preserve anonymity of individuals. Benefits data were provided by Human Resources; additional data were extracted from publicly available websites.

Salaries discussed in this report pertain to the aggregated 9-month (academic year) base salary in Fiscal Year 2018 (FY2018) data for the 1,189 continuing members of the tenure-line faculty (722 Professors, 244 Associate Professors, and 223 Assistant Professors). The salaries of deans and faculty on phased retirement are excluded. As in past years, these data also exclude tenure-line faculty from the Perelman School of Medicine (PSOM), except for those in the basic sciences; as well as the roughly 1,000 clinician educators in the standing faculty from Medicine, Dental Medicine, Veterinary Medicine, Nursing, and Social Policy and Practice.

An academic year base salary is that paid for the normal academic duties of a standing faculty member (teaching, research, and service) for a nine-month academic year, irrespective of whether the salary is disbursed over a nine- or twelve-month period, or paid from General Operating Funds and/or from Designated Funds. In the health care schools, which have some or all standing faculty on a 12-month or “annualized” base, salaries have been adjusted to be comparable with salaries reported on a 9-month basis.

“Summer money”—additional income paid from various sources for all or parts of up to three summer months, and which varies in function of (a) School and (b) faculty effort—is not included in the academic year base salaries analyzed and reported here, nor are other emoluments. We discuss in Section IV.D the implications for our findings of this lacuna.

The report emphasizes two topics:

- Comparison of base salaries at Penn with base salaries at peer institutions.
- Gender differences in faculty salaries within Penn.

Section VI details SCESF’s conclusions and recommendations.

II. Merit Raises for Penn Faculty in Fiscal Year 2018 (FY2018)

A. Process for Setting and Adjusting Faculty Salaries at Penn

Faculty salary levels are set at the time of initial appointment by the dean making the appointment. They are subsequently increased annually based on academic merit through a standardized process that has been described in detail in Sections II.A (general) and II.B (PSOM) in the SCESF report for FY2016 (https://almanac.upenn.edu/uploads/medial_senate_committee_on_the_economic_status_of_the_faculty_fiscal_year_2016_2015.pdf). Funding for faculty salaries comes primarily from each school’s operating budget. No central fund exists for faculty salaries in general. Using available resources, the dean of each school makes a certain amount available for faculty salaries. Particular aspects of faculty salaries for which these funds are used include sustaining existing faculty appointments, providing annual salary and promotion increases for continuing faculty members, and creating salary funding for new faculty positions. Additional resources are available for faculty retentions. All schools must provide funds to cover employee benefits.

B. Target Annual Salary Increases in FY 2018

Penn’s salary guidelines for FY2018 were published in *Almanac* (<https://almanac.upenn.edu/articles/of-record-salary-guidelines-for-2018-2019>). Deans of the twelve schools were given a target salary increase of 3.0% for faculty members continuing in rank. This target has not exceeded 3% since 2006, when it was 4%. Merit increases were to be based “solely on performance as evidenced by scholarship, research, teaching and service to the University and the profession”; cost of living increases were explicitly proscribed. It was acknowledged that “[s]ome Schools and Centers” might not be able to support a 3% increase in their salary budget. In all events, salary increase recommendations for individuals that were below 1% (“for non-meritorious performance”) or above 5% (“due to market conditions”) had to be made in consultation with the Provost.

C. Actual Annual Salary Increases

Tables 1 through 3 and 6 through 8 (Section VIII) provide details regarding annual salary increases in FY2018 for faculty continuing in rank. Table 1 highlights average increases by rank. The other tables consider dispersion (variation) in increases, with disaggregation by School and, within the School of Arts and Sciences (SAS), further separation by division (Humanities, Social Science, Natural Science).

The median salary increase for FY2018 was 3.0%, at all ranks (Table 1). This reprises precisely the median salary increases in the prior year (FY2017). Mean increases (4.4%) were higher than medians (3.0%) due to selective higher individual salary increases at all ranks. The difference between the mean increase and the median increase—which matches the target annual salary increase (Section II.B)—is an indication of the available resources (Section II.A) that Deans are able and/or willing on aggregate to devote to faculty salary increases. In this regard, we note that the mean salary increase declined slightly from FY2017, when it was 4.6%.

Tables 6 (for Professors), 7 (for Associate Professors), and 8 (for Assistant Professors) allow inspection of School differences in median salary increases, and the distribution of the middle 50% of all increases (the interquartile range [IQR], the difference between the third quartile [Q3] and the first quartile [Q1] salary increase). Median salary increases within Schools generally met or exceeded the university-wide salary increase target. Among Professors, the most numerous category (and the rank unaffected by selectivity owing to promotion), only within SAS (Humanities and Natural Science faculty) was the median increase less than 3.0% (2.8%). In comparison with FY2017, there was less variation between Schools in median salaries for Professors and, within Schools, there was on average less of a difference between Q3 and Q1 salaries, with only Engineering & Applied Science (SEAS), Social Policy & Practice (SP2), and Wharton having an IQR of greater than 1.0%. As has been true in the past, variability within Schools in faculty increases is most pronounced for continuing Associate Professors, with five of the nine units (seven Schools) with sufficient numbers of Associate Professors as to sustain presentation of Q3 and Q1 evincing a difference between them greater than 1.0%.

Tables 2 (for all ranks) and 3 (Professors only) highlight the “lower tail” of the salary increase distribution. They show the percentage of continuing faculty with a salary increase that exceeded growth in the Philadelphia Consumer Price Index (CPI) between FY2017 and FY2018, which was 1.9%. In last year’s report the percentage was 98.5% for all continuing faculty (98.0% for Professors alone). This year (FY2018), however, these percentages slipped to 94.9% and 93.6%, respectively. In one respect, this is inexorable arithmetic: With a distribution of salary increases that apparently changed little between FY2017 and FY2018, and an increase in the CPI from 0.7% to 1.9% over the same period, it was almost inevitable that the number of faculty not accorded a salary increase commensurate with change in the CPI would rise. But these extremely low raises are not distributed evenly across Schools—in Dental Medicine, Design, SEAS, and Perelman-Basic Science, 10% to 20% of the continuing faculty did not receive a 1.9% salary increase this past year. The Penn administration anticipates differences between Schools in the capacity to grant salary increases (Section II.A), and it also rules out salary increases pegged to the standard of living (Section II.B). The committee observes that the net effect is differentially distributed across Schools.

D. Annual Salary Levels

Table 9 presents the mean and median salary by rank for faculty continuing in rank for FY2014 (Academic Year 2013-2014) through FY2018 (Academic Year 2017-2018). Across Penn as a whole, the base salaries for Associate Professors continue to be squeezed from below by salaries of Assistant Professors, with the mean of the latter group exceeding the median by \$7,000 in FY2018. This said, there is a strong sense in which the diminished relative position of Associate Professors at Penn reflects not so much salary compression within Schools as it does the relative distribution of faculty by rank across Schools. Consider the two columns of ratios in Table 9: The column “Not Weighted” compares the mean or median for Professors or Associate Professors in a given year to the corresponding mean or median of Assistant Professors in the same year. Thus it is the ratio of the salaries shown in the “Amount” column, for example, the unweighted ratio of the mean Associate Professor salary in FY2018 (\$137,758) to that of Assistant Professors (\$126,802) is 1.09. But in data reported to the committee but not appearing in this report, we observe that Associate Professors are concentrated in the Schools known to have lower salaries. The column “Weighted” adjusts for the different composition by

rank across Schools at Penn. When weighted by School, these ratios are in essence the average salary differential by rank within Schools: Continuing Associate Professors are paid on average 24% (mean) or 25% (median) more than continuing Assistant Professors, in accordance with comparable ratios over the last several years. To the extent that there is any trend in these School-adjusted (Weighted) ratios, the Professorial premium (ratio of average salaries, continuing Professors to continuing Assistant Professors) has crept up from approximately 83% to 85% during this period.

Table 10 presents the same rank- and Academic Year-specific medians shown in Table 9, now bracketed by Q1 and Q3 salaries. The IQR is derived from the difference between these two quantities, and of particular interest is the ratio of the IQR to the median, which adjusts for the fact that the dispersion as measured by the IQR alone could be expected to increase as average salaries grow. FY2018 continues an interesting pattern over the five years observed here: dispersion of Professor's salaries is increasing by about 1% annually; dispersion in the salaries of Associate Professors changes little; and dispersion in the salary of Assistant Professors continues to decline, at a gallop. The IQR-to-Median Ratio, which was 0.82 as recently as FY2014, was only 0.67 in FY2018. Inspection of trends in Q1 and Q3, respectively, reveals that the decline in dispersion of the middle 50% of salaries is being driven in the rise of the Assistant Professor salary level at the 25th percentile, which may itself reflect a rising "floor" (minimal and entry-level salaries). Note that 75th percentile (Q3) salaries for Assistant Professors continue to exceed those for Associate Professors by >\$20,000 (it used to be >\$30,000!), which is part and parcel of the correlated School differences in (a) salaries and (b) proportions of faculty at the rank of Associate Professor noted in conjunction with Table 9.

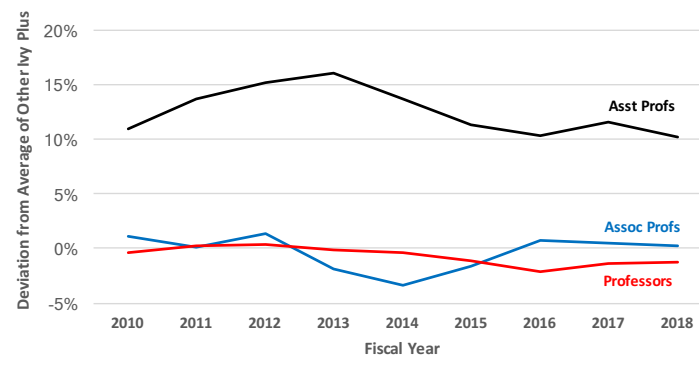
III. Salary Comparisons: Penn's Competitive Standing

A. Comparisons to Ivy Plus Universities

Table 5 displays Penn's mean faculty salary by academic rank, for Academic Years 2009-10 through 2017-18 (FYs 2010 through 2018), benchmarked against mean salaries at other Ivy Plus universities (Ivy League schools minus Dartmouth plus Chicago, Duke, MIT and Stanford). Mean salaries at these peer universities are expressed as percentages of Penn's mean salary, and Penn's rank within this firmament is indexed effective FY2018. Thus Penn's mean salaries ranked 3rd for Assistant Professors, 6th for Associate Professors, and 7th for Professors—a ranking profile that has not changed greatly over the present decade. Figure 1 (below) summarizes Penn's position relative to the remainder of the Ivy Plus: In FY2018, Penn Assistant Professors earned salaries that were 10.2% above the unweighted average of the other Ivy Plus university Assistant Professors' salaries; for Associate Professors and Professors, Penn's differential was, respectively, +0.2% and -1.3%.¹

¹ By an unweighted average, we mean that the Ivy Plus comparison salary does not take into account differences among these universities in the size of their faculties. Also, the comparison in Figure 1 is Penn versus the other 11 Ivy Plus universities—not Penn versus the Ivy Plus group including Penn, as was done in Figure 1 of last year's SCESF report.

Figure 1.
Average Penn Salary Relative to Average Salary of Other Ivy Plus Universities, by Rank, FY2010 to FY2018



Among this group of comparable research universities, base salaries of Penn Assistant Professors rank at or near the top. On average, Assistant Professors at Penn continue to earn over 10% more than the average for Assistant Professors across the other Ivy Plus universities, although in FY2018 a large jump in Assistant Professor salaries at Harvard moved Penn down to 3rd (also behind Stanford) in the Ivy Plus group. Penn had led the entire Ivy Plus in Assistant Professor salaries from FY2011 through FY2014, years in which Penn's positive salary differential ranged from 13.7% to 16.0%.

These highly advantageous faculty salaries are not achieved at other ranks, however. FY2018 continues a recent (three-year) pattern in which average salaries at Penn drift toward the Ivy Plus overall mean, from very slightly above for Associate Professors and somewhat below (still a -1.3% differential) for Professors. Associate Professor salaries remain substantially below those at Columbia, Stanford, MIT and Harvard; and somewhat below those at Princeton. Salaries of Professors at Penn continue to be stable in comparative perspective. We are well below those at Columbia, Stanford, Harvard, Princeton, and Chicago, and in a cluster with MIT and Yale, with Duke a bit below.

It could be argued that average salary differentials within the Ivy Plus group reflect differences between universities in the cost of living in the cities in which they are located. Table 5 – Adjusted reflects data provided to the committee in an attempt to adjust Penn's salary compensation position relative to other universities with reference to cost-of-living. A lot can be said, both for and against the relevance of cost-of-living-adjusted salary data, but much of it is rendered moot at this point by the poor quality of the cost-of-living indexes, which were queried in detail by the committee. The temporal variation in these indexes is large and idiosyncratic, to the point where inter-university comparisons, when looked at over time, seem to have as much if not more to do with idiosyncrasies in these indexes than with differences in the rate of change of salaries between universities. The surface take-away message of Table 5 - Adjusted—that with adjustments for cost-of-living, Penn is very well-placed competitively (and that effective salaries are far and away highest at Duke)—is not fully credible.

B. Comparisons to the Association of American Universities

The Association of American Universities Data Exchange (AAUDE) is a source of information about faculty salaries at an expanded group of 62 peer research universities: 34 public², 26 private³ (including Penn and all eleven other Ivy Plus universities) and two Canadian.⁴

Because of the marked variation in salaries across schools and academic levels, comparisons to the AAU dataset are broken out by academic field and rank in Table 4. The most recent data are as reported for Fall 2017 (which corresponds to FY2018, under the assumption that universities are able to report salaries current during the 2017-18 Academic Year). Categories with fewer than five faculty members at Penn were omitted from the table to preserve confidentiality.

Across disciplines, Penn's national rank varies. It is expected that those disciplines consistently ranked high in their field should be compensated at a level near the top of the discipline. At the level of Professor, Penn continues to have several signal successes: Annenberg first out of 41 reporting; Nursing second out of 30; within Wharton, Business & Management and Statistics both first (out of 53 and 51 respectively). The same two Wharton departments stand out among Associate Professors, and Public Policy within Wharton is first for Assistant Professors, among 55 universities reporting. The only other "top 3" ranking for Assistant Professors is Social Policy & Practice (third out of 25), and it is worth noting that Penn's exceptional standing with respect to salary for Assistant Professors as noted with respect to the Ivy Plus data (Section III.A) is far less evident in this AAU comparison.

² Georgia Tech, Indiana, Iowa State, Michigan State, Ohio State, Penn State, Purdue, Rutgers, Stony Brook, Texas A&M, SUNY-Buffalo, Arizona, UC-Davis, Berkeley, UC-Irvine, UCLA, UCSD, UCSB, Colorado, Florida, Illinois, Iowa, Kansas, Maryland, Michigan, Minnesota, Missouri, UNC, Oregon, Pittsburgh, Texas, Virginia, Washington, Wisconsin.

³ BU, Brandeis, Brown, Cal Tech, Carnegie-Mellon, Case Western, Columbia, Cornell, Duke, Emory, Harvard, Johns Hopkins, MIT, NYU, Northwestern, Princeton, Rice, Stanford, Tulane, Chicago, Penn, Rochester, Southern Cal, Vanderbilt, Wash U (St. Louis) and Yale.

⁴ McGill and Toronto.

Rankings change slowly in Table 4, especially when changes in the number of universities being ranked are taken into account. Positive exceptions include SEAS and Natural Science (SAS) Professors: The former, which were 17th out of 59 and 16th out of 60 in Fall 2015 and Fall 2016, respectively, were up to 11th out of 56 in Fall 2017. The latter, who were 18th out of 60 as recently as Fall 2015, were at 13th out of 57 in Fall 2017. Natural Science (SAS) also gained in the last year at the Associate Professor level (from 18th to 15th out of 56) and at the Assistant Professor level (from 18th to 12th out of 57). Nonetheless, the ranking of Natural Science (SAS) remains low relative to other Penn sub-units. So too do Professor salaries in Dental Medicine, having dropped from 11th out of 45 in Fall 2016 to 15th out of 46 in Fall 2017.

IV. Salaries of Female Faculty Continue to Lag Salaries of Male Faculty

A. Mean Salary Increases for Men and Women

Annual percentage increases in salary for faculty who continued in rank are similar for men and women faculty at Penn (Table 11). Given the presence of a gap in salaries between male and female faculty at Penn noted in previous reports from SCESF, this similarity anticipates the disparity noted below (Section IV.B) in FY2018.

B. Gender Gap in Faculty Salaries at Penn

Despite the general parity in annual salary increases (Table 11), differences in base salaries for men and women have persisted over the years (Table 12). At the Professor level (24% of whom are women), the mean academic year base salary for women is \$14,518 less than the mean salary for men at the same rank. At the Associate Professor rank (38% women), the mean salary for women is \$9,008 less than the mean salary for men. This is the only rank where the difference in salaries by gender changed appreciably: it was \$15,594 in FY2017 (and \$22,541 in FY2016). The gap in mean salaries is most substantial—not just in percentage, but in absolute dollars as well—at the Assistant Professor level (45% women): \$16,286 in FY2018 (down only \$481 from FY2017).

C. Factors Contributing to the Disparity

Traditionally male-dominated fields typically benefit from higher salaries than those found in fields that are either female-predominant and/or historically open to women. Schools at Penn differ from one another in their mean salaries in large measure because they differ from one another in their composition by field or discipline. Table 12 thus features a second column for women, which recalculates the mean salaries of women by weighting their School-specific salaries by the proportion of all male faculty found in those Schools. This weighted or adjusted mean—what would the average salary be across all female faculty if female faculty maintained their own salaries, but were distributed across the University in the same proportion as males?—can then be compared with the existing (same) average male salary at Penn. The results are instructive. A very substantial portion of the actual, unweighted wage disparity evident in Table 12 results from differences in gender ratios in faculty across the different Schools. In fact, in FY2018, apparently for the first time, differences in the distribution of the genders by School account for all of the observed difference in average salaries among Assistant Professors and Associate Professors. Among Professors, there is still a \$3,505 residual in favor of males, although equating the distributions of men and women across Schools (without considering smaller divisions and departments within many Schools) does account for three-fourths of the observed difference in average salaries. It is important to recognize that insofar as Schools vary in their gender distribution, statistical adjustment for this difference does not gainsay an observation that women may be receiving disparate treatment (lack of equity) in addition to inequality (female faculty at Penn are being paid less than men [Section IV.B]).

To further explicate sources of the gender disparity, the Vice Provost provided SCESF with a regression analysis conducted by the Office of Institutional Research and Analysis (IRA). This analysis regresses the log of base salary on gender, race/ethnicity, experience (measured by academic rank and time in rank), status as a department or endowed chair, and academic field. Academic field is roughly grouped at a School level, retaining some of the heterogeneity present in the weighted analysis of Table 12. The regression analysis shows that, without adjustment for field, rank, or time in rank, women have a base salary that is 17.8% lower than that of male faculty. This holds with or without adjustment for ethnicity. Further adjustment for rank does reduce this gap substantially, to 7.8%; there are proportionally fewer women in higher paid ranks. Note that aside

from rank, and recognizing whether a faculty member has an endowed chair, the regression analysis does not account for research productivity or teaching performance.

Time in rank and having an administrative role or endowed chair are predictive of overall salary but have no influence on the gender gap. Adjustment for academic field, however, substantially reduces the gender gap to 0.5%, which is congruent with what was demonstrated via direct standardization (weighting) in Table 12.⁵

More and more women have been hired into Penn. There is little evidence that, adjusted for rank and School, salaries differ between men and women (with one important exception, noted in the next paragraph). As cohorts who are disproportionately male exit Penn, overall salary differences between men and women will tend to lessen.

D. Base Salary is Not Total Salary

It is impossible for SCESF to provide a comprehensive analysis of gender equity from base salary alone, and our committee still does not have access to data on total faculty compensation. In last year's report, SCESF compared the total salary volume implied from available data provided for this report (Tables 9 and 10) with "side information"—data from the Penn Operating Budget—and noted a disparity not likely attributable to definitional differences in the number of faculty. A higher-level of faculty compensation than can be observed in the present report is not a bad thing. From the faculty's *overall* perspective, it is a good thing. However, there is plenty of anecdotal evidence that women do not fare as well as men within Schools in the provision of non-"normal salary" economic compensation. To the extent that this is true, this would put to lie the conclusion (Section IV.C) that cohort succession will eventually produce economic equality between genders, at least *within* different Schools. In addition, conjectures abound that the School differences in salaries that maintain differences in overall pay by gender at the University (Table 12) would only exacerbate these differences were total salary compensation subject to observation. Absent a fuller accounting of faculty compensation, it is difficult to rule out anecdotal evidence and/or conjecture.

V. Faculty Benefits at Penn and Comparisons to Ivy Plus Universities

Benefits are an important aspect of total compensation and are of great interest to university faculty. Table 13 features a comparison of the parameters pertaining to two of the primary benefits available to Penn faculty—retirement contributions and undergraduate tuition for dependents—with those prevailing at the other Ivy Plus institutions, Carnegie Mellon, Dartmouth, and Michigan.

Penn offers two types of retirement plans. In the Basic Plan, the University makes contributions to 403(b) tax-deferred retirement accounts on an increasing scale with faculty member age (to a maximum of 4% of base salary at age 40 and over). In the Matching Plan, Penn matches the faculty member's contributions dollar-for-dollar in a 401(a) tax-deferred retirement account. The contribution limit increases with age to a maximum of 5% of salary below \$280,000 (at age 40 and over). Virtually all eligible faculty participate in the matching retirement account program. Penn's maximum contribution of 9% (4% to 403[b] plus 5% to 401[a]) remains below the Ivy Plus group median of 10%.

Penn offers tuition benefits for faculty members, their partners, and their dependents. Benefits depend on whether enrollment is at Penn or another institution and are different for faculty hired before 1997, for example, in the availability of graduate and professional school tuition for dependents. Here we continue the practice of focusing on the most-used of these benefits, those for the undergraduate tuition of dependents. Penn covers 75% of the tuition and technology fees (\$37,530 in FY2018) for dependents enrolled at Penn ("home") and up to 40% of Penn's tuition fee (\$19,688 in FY2018) for dependents enrolled elsewhere. Penn's tuition benefits rank us 7th (out of 15) with respect to both "home" tuition and the tuition contribution for students not attending the university at which

⁵ The specific pattern after standardization shown in Table 12—no salary differences by gender (or a nominal female advantage) among Assistant and Associate Professors; a small continuing advantage even after adjustment for male Professors—was replicated in regressions that allowed the effects of control variables to vary by rank. The granular differences between Table 12 and the regression analysis may be attributed to the use of slightly different data. Table 12 limits the comparison to faculty who continued in rank, whereas the regression analysis includes promotions and appointments, and those in administrative positions (e.g., department chairs).

a faculty member is employed.⁶

These data have their limits. They do not include, from the perspective of comparisons with peer institutions, data on major benefits including medical, vision, and dental insurance. They also do not include policies regarding retirement incentives. Within Penn, we do not have data on the distribution of *use* of various benefits across faculty, a matter that bears on the distribution of non-base salary and benefits as discussed in conjunction with gender equity and equality (Section IV.D).

VI. Issues of Concern and Recommendations from SCESF

We encourage the President, Provost, Deans, and the faculty at large to continue to monitor closely faculty compensation across the entire university in order to maintain Penn's competitive position with peer institutions. We all need to be attentive to the effects of salary disparities—those that all now agree must be eliminated, in particular those based on gender (and other ascribed characteristics not discussed in this report); but also those that are tolerated because they reflect “market conditions”—on the functioning of the university and its intellectual eminence.

In accordance with Faculty Senate policy, we present the following issues of concern and our recommendations to address these issues.

A. Expanding Economic Data Beyond Base Salary

Issue of Concern: Faculty salaries are the preponderant form of faculty compensation, but there is still much faculty compensation that comes from sources other than the annual salaries available in the standard tables. This compensation includes summer salaries, administrative stipends, performance bonuses, pay for additional teaching, and support from grants and contracts—to name but a few sources. The array of such sources is so great that, within our committee, no two faculty from any two different Schools could adumbrate the same set of sources. This said, delimiting the universe of non-salary compensation is not impossible, and will be easier to do once future Committees have access to data on total compensation (perhaps exclusive of benefits, perhaps not).

SCESF Recommendation: SCESF requests that data from the Provost's Office be expanded next year to include total compensation for faculty. Concerns over which sources “should” (or should not) be counted is not a good reason for delaying a parallel tabular presentation of these data. It is better to see the whole and let the debate over meaning commence from there.

Response Past assessments of standing faculty salaries by the Faculty Senate have been carried out using academic base salaries. In response to requests by the Faculty Senate Tri-Chairs in FY18 and FY19, the Office of the Provost explored the feasibility of providing the Senate with new categories of data that could provide a broader picture of payments to faculty than is painted by base salary data currently provided in twelve data tables prepared annually by the Office of Institutional Research and Analysis. Senate leadership requested “total compensation” or “actual paycheck” data, speculating that such data might, for example, suggest that “additional pay” opportunities are more available to certain groups of Penn faculty than others. Following consultation with Human Resources and Institutional Research and Analysis, the Provost's Office notified the Tri-Chairs that further exploration of its request for broader data must await the completion of the University's Human Capital Management project, which will upgrade Penn's payroll systems and processes and impact reporting options. In the meantime, the University encourages the Senate to join the Provost's Office in sharing concerns with the Deans and department Chairs concerning the impact of earnings paid to faculty above base pay.

B. Assessing the Economic Status of the Entire Faculty

Issue of Concern: SCESF is charged with gathering and organizing data on academic salaries and benefits for the faculty and to represent the faculty in the determination of University policy on salary issues. This year, SCESF was provided academic base salary data for 1,189 continuing faculty. Penn publicly claims 2,753 standing faculty.⁷ Yet again this

⁶ Benefits for two parent-partners employed at Penn are not summed, so when partners are both employed at Penn, only one tuition benefit can be used for each child. For this group of faculty, Penn's situation is less advantageous, since there are peer universities where these benefits pertain to the parent and not to the child.

⁷ Retrieved 18 February 2019 from <http://www.upenn.edu/about/facts> The reference is to Standing Faculty. We infer that the number includes both tenure-track faculty and Clinician Educators. A further 2,040 Associated Faculty and 2,461 Academic Support Staff are referenced separately.

committee falls short of its charge because the Provost's Office provides base salary data for less than half of the acknowledged standing faculty.

SCESF Recommendation: To provide a more complete analysis of faculty salary and benefits, SCESF requests that data from the Provost's Office be expanded next year to include the academic base salary for all standing faculty, subject to the standard exclusion of deans and faculty members in phased retirement. SCESF again requests the PSOM standing faculty data to analyze along with data from every other School at Penn

Response Historically, the Senate has been supplied with twelve tables of data prepared by Institutional Research and Analysis that include the salaries of clinical and clinical department faculty in PSOM. Peter Quinn, Vice Dean for Professional Services for PSOM, met with Faculty Senate leaders to explain the complexities of PSOM salaries, many of which include a base salary that is a minimum for rank; a base salary supplement, also called an adjusted base salary, that is the result of individual arrangements; and clinical income tied to patient care-related responsibilities and performance. Rigorous processes in the departments and School promote internal equity and national competitiveness. Additional data are not available at this time, as concerns remain in the Schools about the necessity and annual capacity of additional salary assessment by the Faculty Senate.

C. Maintaining Penn's Competitive Standing

Issue of Concern: To attract and retain an eminent faculty, the University must provide faculty salaries that are competitive with peer institutions in the top tier of U.S. research universities. Penn's stated goal is to provide compensation, on average, in the middle of the upper half of our most relevant peer group, the Ivy Plus institutions (see the 2016 SCESF report <http://www.upenn.edu/almanac/volumes/v62/n24/contents.html>). This goal continues to be met for Assistant Professors. The ranking of salaries for Professors and Associate Professors is middling, not lofty, hence short of the stated goal. Also, when comparisons are extended beyond the Ivy Plus group, and disaggregated by School, there are a number of schools, disciplines and/or divisions where salaries are not distinguished. This has implications for the maintenance of Penn's high national standing in these fields.

SCESF Recommendation: SCESF recommends that faculty salary data for our peer institutions (Table 5) be used in the University budget process to determine an appropriate target for annual salary increases for Penn faculty and that peers-within-disciplines (i.e., the AAUDE information in Table 4) be used by Deans to make sure that salaries in all fields are commensurate with those at the institutions with which we are ostensibly competing.

Response Peer and other economic data are used in the University budget process to determine appropriate targets for annual merit-based salary increases. The University believes Penn maintains a competitive edge in recruitment and retention due to Penn's generous benefits and policies, such as the tuition benefit and parental leave policies, combined with Philadelphia's relatively lower cost of living and central location. Endowed chairs, supplemental research funding, and summer research funding contribute to Penn's associate and full professors being better compensated relative to their peers than the available base salary comparison data indicate. As the Report notes, the base salaries of Penn assistant professors rank near the very top of base salaries paid assistant professors by our peer universities.

D. Achieving Gender Equity at Penn

Issue of Concern: SCESF remains focused on the persistent gender inequality in faculty base salaries at Penn. Standardization and regression analysis reveal that the salary gap is largely explained by differences in the distribution of faculty by rank (women are less likely to be Professors and are more likely to be Associate Professors and Assistant Professors) and School (women are disproportionately represented in the Schools where salaries are lower). But this is explanation on a statistical basis only. It begs the question of whether this is an equitable state of affairs. With respect to the representation of female faculty across ranks, the news is good. More gender equality with respect to hiring and promotion is slowly but surely evening the distribution by rank of men and women. The news is also good with respect to salary equality within Schools: The fact that, within ranks (with some lag at the Professor level), standardization with respect to School essentially equates male and female salaries means that salaries are on average equivalent within Schools. Yet: There

is a strong correlation between gender and School—a big source of variation in salaries (in addition to age and/or time in rank) is the School in which faculty are appointed. Salaries are much higher in some Schools. They are also much higher in some disciplines than in others, but the real distinguishing characteristic is School. So long as the lower-paid Schools are those staffed disproportionately by women, average university salaries will remain higher for men than for women. Is such inequality, tied as it is to the market conditions that govern inter-School variation in salaries, equitable? That is, by displacing the explanation for salary differentials between male and female faculty from the characteristics of the individuals involved to the Schools in which they find themselves, is this a fact of life, or a sleight-of-hand? This is without taking into account the possibility that within-School, within-rank equality in faculty base salaries may mask continuing differential treatment with respect to access to additional compensation beyond base salary, such as summer support, overload teaching and service activities. The extent and distribution of this additional income, which has the potential to influence the gender gap in salaries at Penn among the faculty, is not included in the data provided to SCESF (Sections IV.D and VI.A).

SCESF Recommendation: We urge the President, the Provost, and the Deans to focus on eliminating gender inequities in faculty salaries across the University. It is difficult to buck market forces, but there are also costs to maintaining structured inequality by gender. Some redress with respect to School salary differentials would go far toward improving gender equality in salaries and would help with respect to comity and collegiality as well.

Response *The recruitment and retention of an excellent and diverse faculty is one of Penn's highest priorities. The President, Provost, and the Deans are firmly committed to ensuring that faculty salaries reflect its commitment to inclusion and equity. The differential in aggregated academic bases salaries has continued to decline as a result of the focused attention of the Deans in collaboration with the Provost's Office. The regression analyses performed based on data for academic year 2018, indicated that there is not a statistically significant different in average salaries for women and men on Penn's faculty after controlling for rank, time in rank, academic discipline, and status as an endowed professor, department chair or other administrative role. We remain firmly committed to ensuring that any unexplained differences, even if not statistically significant, are addressed. We are pleased with the progress that has been made, but not complacent. We will continue to work in partnership with the Deans to ensure the equitable compensation of Penn's faculty which is essential to our efforts to recruit and retain and eminent faculty.*

E. Improving Retirement Benefits

Issue of Concern: Retirement benefits are almost universally taken by faculty but are less than those available at other competitive universities.

SCESF Recommendation: We encourage the President and Provost to increase the matching benefits contribution (above age 40) to 10%, bringing Penn into line with Ivy Plus and other peers.

Response *The University fully cooperates with the Faculty Senate's efforts to assess and report on the adequacy, availability, and utilization of faculty employee benefits. In recent years, Human Resources has presented the Faculty Senate and the University Council Personnel Benefits Committee with a comprehensive overview of faculty employment benefits. Moreover, the Vice President for Human Resources has met with the Faculty Senate Tri-Chairs to review the overall benefits package provided to Penn's faculty, including the employer retirement contribution under its 403(b) and 401(a) plans. The retirement plan portion of the employee benefits review included comparison with fourteen peer institutions, whose contributions ranged from a low of 8% to a high of 15%, with a majority of Penn's peers offering a 10% retirement contribution. Penn's contribution was and remains 9%. Penn benefits for faculty include, in addition to retirement plan contributions, tuition benefits, medical insurance, dental insurance, paid parental leave, and life insurance. Standing faculty are also eligible for Penn's Faculty Income Allowance Plan (FIAP) retirement incentive. The University believes the overall package of benefits Penn offers is fully competitive with those offered by its peers within the envelope of available resources. The University will continue to review and assess its benefits packages to ensure that they remain competitive and to identify enhancements that would strengthen its recruitment and retention efforts.*

VII. 2018-2019 Members of the Committee

Peter Cappelli, Wharton/Management
Blanca Himes, PSOM/Biostatistics, Epidemiology, & Informatics
Sarah Kagan, Nursing
Iouri Manovskii, SAS/Economics
Pamela Sankar, PSOM/Medical Ethics & Health Policy
Herbert Smith, *Chair*, SAS/Sociology

Ex Officio:

Jennifer Pinto-Martin, Nursing, Faculty Senate Chair
Santosh Venkatesh, SEAS/Electrical & Systems Engineering, Faculty Senate Past Chair
Steven Kimbrough, Wharton/Operations, Information & Decisions, Faculty Senate Chair-Elect

The Committee gratefully acknowledges the essential and invaluable assistance of J. Patrick Walsh of the Office of the Faculty Senate and the additional information provided in response to SCESF requests by the offices of the Provost, Institutional Research and Analysis and Human Resources. The Committee also notes that this year's full report directly benefited from presentation and analysis described in reports from previous years and, where appropriate, some previous text is included there.

VIII. Tables

Table 1

Average academic base salary percentage increases of continuing Penn standing faculty members by rank in comparison with the Consumer Price Index (CPI) and Penn Budget Guidelines

Group/Condition/Metric		FY 2017-2018
Professor	Mean	4.2%
	Median	3.0%
Associate Professor	Mean	5.8%
	Median	3.0%
Assistant Professor	Mean	3.6%
	Median	3.0%
All Three Ranks	Mean	4.4%
	Median	3.0%
U.S. City Average CPI Growth	Mean	2.9%
Phil. CPI Growth	Mean	1.9%
Budget Guidelines	Mean	3.0%

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

FY 2017-2018 CPI growth for the U.S. and for Philadelphia are based on a change in CPI from June 2017 to June 2018

Table 2

Percentage of continuing Penn standing faculty members awarded percentage salary increases exceeding the percentage growth in the consumer price index (CPI) for Philadelphia

Schools and Disciplinary Areas	Percentage of all Standing Faculty with Salary Increases Exceeding Growth in the CPI (Phil.) FY 2017 to 2018
Annenberg	100.0%
Dental Medicine	86.4%
Design	84.2%
Engineering & Applied Science	89.8%
Graduate Education	100.0%
Humanities (A&S)	98.3%
Law	100.0%
Natural Science (A&S)	94.2%
Nursing	100.0%
Perelman-Basic Science	86.0%
Social Policy & Practice	100.0%
Social Science (A&S)	99.1%
Veterinary Medicine	96.0%
Wharton	98.1%
All Schools/Areas	94.9%
U.S. City Average CPI Growth	2.9%
Phil. CPI Growth	1.9%
Budget Guidelines	3.0%

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

FY 2017-2018 CPI growth for the U.S. and for Philadelphia are based on a change in CPI from June 2017 to June 2018

Table 3

Percentage of continuing Penn FULL PROFESSORS awarded percentage salary increases exceeding the percentage growth in the consumer price index (CPI) for Philadelphia

Schools and Disciplinary Areas	Percentage of all FULL PROFESSORS with Salary Increases Exceeding Growth in the CPI (Phil.) FY 2017 to 2018
Annenberg	100.0%
Dental Medicine	85.0%
Design	80.0%
Engineering & Applied Science	89.3%
Graduate Education	100.0%
Humanities (A&S)	97.1%
Law	100.0%
Natural Science (A&S)	94.0%
Nursing	100.0%
Perelman-Basic Science	80.9%
Social Policy & Practice	100.0%
Social Science (A&S)	100.0%
Veterinary Medicine	92.6%
Wharton	97.4%
All Schools/Areas	93.6%
U.S. City Average CPI Growth *	2.9%
Phil. CPI Growth *	1.9%
Budget Guidelines +	3.0%

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

FY 2017-2018 CPI growth for the U.S. and for Philadelphia are based on a change in CPI from June 2017 to June 2018

Table 4

Rank of mean salaries of Penn faculty by academic fields as compared to universities participating in the Association of American Universities Data Exchange (AAUDE) survey

Academic Field	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017
Full Professor							
Annenberg	1/41	1/39	1/43	1/43	1/43	1/42	1/41
Dental Medicine	10/45	9/43	9/44	11/44	10/46	11/45	15/46
Design	10/53	11/52	10/55	11/56	11/57	10/54	10/52
Engineering & Applied Science	13/55	14/54	13/58	14/59	17/59	16/56	11/56
Graduate Education	6/47	7/45	4/45	6/45	6/47	6/45	6/47
Humanities (A&S)	7/56	11/55	11/58	10/59	11/60	10/57	9/57
Law	7/39	8/38	7/39	8/38	6/41	6/40	4/38
Natural Science (A&S)	12/56	11/55	14/58	15/59	18/60	14/57	13/57
Nursing	1/19	1/19	1/21	3/23	1/24	2/24	2/30
Perelman - Basic Science	6/56	8/55	7/58	8/59	9/60	6/57	6/57
Social Policy & Practice	6/25	6/23	6/26	4/27	3/27	3/26	1/25
Social Science (A&S)	8/56	9/55	9/57	9/58	7/59	9/57	8/57
Veterinary Medicine	3/14	4/13	2/13	3/13	4/13	5/14	4/16
Wharton-Business & Management	5/53	2/52	3/55	2/56	1/56	1/53	1/53
Wharton-Public Policy	13/54	12/53	5/55	9/56	10/57	9/55	9/55
Wharton-Statistics	1/34	2/34	2/36	2/34	1/34	1/32	1/31
Associate Professor							
Annenberg	-	-	-	-	-	-	-
Dental Medicine	13/43	9/41	-	6/44	-	-	-
Design	1/51	3/51	3/52	3/54	4/56	6/53	6/53
Engineering & Applied Science	11/54	11/53	10/56	11/57	10/57	7/54	7/55
Graduate Education	8/45	9/44	9/44	6/45	6/47	6/44	6/46
Humanities (A&S)	11/55	13/54	12/57	10/58	9/59	10/56	8/56
Law	-	-	-	-	-	-	-
Natural Science (A&S)	15/56	17/55	17/58	15/58	17/59	18/56	15/56
Nursing	5/19	3/19	2/21	7/24	7/25	4/25	5/31
Perelman - Basic Science	4/55	4/54	3/57	4/58	5/59	5/56	6/56
Social Policy & Practice	-	-	-	-	-	6/26	4/25
Social Science (A&S)	8/56	14/55	10/56	7/57	8/58	10/56	8/56
Veterinary Medicine	6/14	6/13	7/13	7/13	4/13	4/14	6/15
Wharton-Business & Management	2/51	2/51	3/54	3/56	3/56	1/53	1/53
Wharton-Public Policy	-	-	-	-	-	-	-
Wharton-Statistics	2/27	2/30	-	-	-	-	1/27
Assistant Professor							
Annenberg	-	-	3/41	3/42	-	2/40	-
Dental Medicine	-	-	-	-	-	-	-
Design	6/51	4/50	5/54	7/55	7/56	5/52	5/52
Engineering & Applied Science	7/54	8/54	8/58	10/59	6/59	7/56	8/56
Graduate Education	-	15/43	12/44	13/44	11/46	13/44	10/45
Humanities (A&S)	14/56	17/55	14/58	13/59	9/59	9/56	8/56
Law	6/27	-	-	-	-	-	-
Natural Science (A&S)	15/56	22/55	16/58	18/59	20/60	18/57	12/57
Nursing	3/19	2/19	3/21	5/24	5/25	4/25	8/31
Perelman - Basic Science	6/56	9/55	9/58	10/59	15/60	5/57	6/57
Social Policy & Practice	-	5/24	5/26	5/27	6/27	8/26	3/25
Social Science (A&S)	7/56	8/55	7/57	8/58	11/59	14/57	13/57
Veterinary Medicine	5/14	5/12	5/13	5/13	5/13	4/14	8/16
Wharton-Business & Management	4/52	4/51	5/54	7/55	4/56	4/53	5/53
Wharton-Public Policy	1/54	1/53	1/52	1/55	1/56	1/55	1/55
Wharton-Statistics	-	-	-	-	-	-	-

Using the federal CIP (Classification of Instructional Programs) codes for 2010, departments at comparable universities were mapped to Penn Schools.

Calculations of rank only include those universities that have relevant departments. Therefore, the number of universities among which Penn is ranked varies by field.

Rank is suppressed for all cells which contain fewer than five Penn faculty members.

Table 5

Percentage differences in mean academic base salary of Professors at a sample of comparable research universities for Academic Years 2009-2010 through 2017-2018

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Full Professors - Mean Academic Base Salaries: Percentage Differences*									
Columbia	10.9%	9.3%	8.9%	13.5%	12.1%	13.4%	16.6%	16.8%	15.6%
Stanford	6.6%	7.6%	7.6%	10.9%	11.9%	13.6%	13.3%	13.1%	13.3%
Harvard	12.4%	10.7%	9.3%	8.6%	7.7%	8.1%	8.7%	8.8%	13.1%
Princeton	6.4%	6.2%	6.7%	7.0%	7.2%	9.3%	9.9%	9.7%	9.5%
Chicago	8.2%	8.7%	8.9%	8.9%	9.6%	10.0%	14.7%	9.0%	7.8%
MIT	-5.4%	-5.3%	-5.4%	-4.4%	-3.3%	-1.8%	0.0%	1.4%	2.5%
Penn	\$170.1	\$175.1	\$181.6	\$187.0	\$192.3	\$197.5	\$202.6	\$209.2	\$217.3
Yale	2.4%	1.1%	-0.7%	-0.4%	-0.1%	0.5%	0.4%	0.1%	-1.4%
Duke	-5.5%	-6.7%	-3.5%	-3.6%	-3.1%	-2.1%	-2.4%	-2.4%	-3.5%
Dartmouth	-9.4%	-9.9%	-10.7%	-10.5%	-9.5%	-9.6%	-9.0%	-9.6%	-9.5%
Brown	-14.3%	-13.9%	-13.7%	-14.0%	-14.4%	-14.6%	-14.3%	-14.5%	-15.4%
Cornell	-8.8%	-9.9%	-10.9%	-14.5%	-14.2%	-14.2%	-13.6%	-16.7%	-17.8%

NOTES: Penn academic base mean salaries are based on standing faculty members at the rank of professor. Excluded are all members of the Faculty of Medicine except basic scientists, and all standing faculty members who are appointed as Clinician Educators. Data Source: AAUP Salary Surveys.

*Universities are ordered from highest to lowest percentage difference for full professors as of 2017-2018. For each year reported, the difference between the Penn mean salary and the mean salary for a comparison university was computed as a percentage of the Penn salary.

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Associate Professors - Mean Academic Base Salaries: Percentage Differences*									
Columbia	6.2%	8.9%	6.1%	12.9%	21.6%	21.2%	20.0%	20.4%	15.1%
Stanford	12.9%	12.7%	11.4%	15.2%	17.3%	13.0%	9.2%	11.3%	12.6%
Harvard	6.1%	7.3%	2.6%	1.4%	3.6%	2.3%	-2.3%	-5.6%	8.3%
MIT	0.7%	2.3%	2.1%	4.5%	6.4%	7.0%	3.2%	6.2%	6.4%
Princeton	6.1%	7.4%	5.0%	10.1%	8.5%	6.2%	4.5%	4.6%	2.6%
Penn	\$110.2	\$112.5	\$117.8	\$117.3	\$119.5	\$125.2	\$132.3	\$135.0	\$140.1
Duke	-6.9%	-7.6%	-2.8%	2.3%	1.1%	1.3%	-2.9%	-0.3%	-0.9%
Yale	-10.7%	-7.7%	-7.8%	-3.6%	-1.0%	-6.3%	-7.7%	-3.0%	-3.6%
Dartmouth	-5.0%	-4.6%	-7.9%	-4.9%	-4.9%	-9.6%	-11.9%	-9.6%	-8.4%
Chicago	-3.3%	-3.2%	-3.1%	0.3%	-0.5%	-0.7%	-0.1%	-5.9%	-10.1%
Cornell	-1.3%	-2.8%	-4.1%	-5.6%	-3.5%	-5.5%	-6.5%	-9.1%	-10.1%
Brown	-16.6%	-14.0%	-15.7%	-11.9%	-10.0%	-10.3%	-13.3%	-14.1%	-14.3%

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assistant Professors - Mean Academic Base Salaries: Percentage Differences*									
Harvard	2.1%	-2.6%	-2.2%	-2.4%	-3.0%	-5.3%	-2.5%	-3.0%	8.0%
Stanford	-1.8%	-3.2%	-2.2%	-4.2%	-0.4%	2.4%	2.1%	0.5%	1.0%
Penn	\$102.3	\$106.8	\$112.3	\$116.2	\$118.0	\$119.6	\$123.3	\$127.5	\$130.3
Columbia	-9.8%	-9.0%	-11.8%	-9.0%	-6.0%	-4.6%	-1.5%	-3.7%	-3.1%
MIT	-1.7%	-6.4%	-8.5%	-8.5%	-5.8%	-4.4%	-5.6%	-5.4%	-4.5%
Chicago	-2.2%	-5.9%	-8.6%	-11.6%	-10.5%	-6.1%	-6.1%	-7.3%	-6.8%
Cornell	-9.8%	-9.6%	-13.6%	-15.8%	-16.6%	-13.6%	-8.4%	-11.8%	-10.5%
Princeton	-14.3%	-15.0%	-16.1%	-16.7%	-13.8%	-12.5%	-13.0%	-13.8%	-11.6%
Duke	-12.2%	-18.4%	-14.5%	-16.3%	-12.3%	-11.9%	-10.9%	-10.6%	-12.4%
Yale	-16.3%	-18.1%	-20.1%	-18.9%	-18.7%	-16.7%	-16.2%	-14.7%	-15.9%
Dartmouth	-18.9%	-20.0%	-20.1%	-23.1%	-20.3%	-16.3%	-17.6%	-19.7%	-20.3%
Brown	-23.3%	-24.3%	-26.7%	-26.0%	-24.7%	-22.8%	-23.5%	-25.2%	-25.2%

Table 5 - Adjusted

Percentage differences in mean ADJUSTED academic base salary of Professors at a sample of comparable research universities for Academic Years 2009-2010 through 2017-2018

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Full Professors - Mean ADJUSTED Academic Base Salaries: Percentage Differences*									
Duke	17.3%	9.0%	12.7%	12.6%	11.7%	12.7%	12.5%	12.4%	9.8%
Princeton	-1.3%	1.2%	1.7%	2.0%	2.2%	4.2%	4.8%	4.5%	6.4%
Columbia	-5.7%	-4.6%	-5.0%	-1.0%	-1.1%	0.1%	3.0%	3.2%	0.7%
Penn	\$142.8	\$152.8	\$158.5	\$163.2	\$169.1	\$173.7	\$178.2	\$184.0	\$192.5
Yale	6.8%	1.8%	0.0%	0.3%	-2.0%	-1.6%	-1.6%	-1.8%	-1.3%
Harvard	-1.9%	-4.6%	-5.9%	-6.5%	-8.1%	-7.8%	-7.3%	-7.2%	-3.9%
Chicago	12.3%	8.2%	8.3%	8.3%	5.7%	6.1%	10.6%	5.2%	-9.7%
Brown	-9.7%	-7.6%	-7.3%	-7.7%	-9.6%	-10.0%	-9.7%	-9.8%	-11.4%
MIT	-17.4%	-18.4%	-18.5%	-17.6%	-17.5%	-16.2%	-14.7%	-13.5%	-12.9%
Cornell	2.5%	0.0%	-1.2%	-5.2%	-7.2%	-7.1%	-6.5%	-9.9%	-13.5%
Stanford	-34.9%	-21.1%	-21.1%	-18.8%	-19.1%	-17.9%	-18.1%	-18.3%	-21.4%

NOTES: Penn academic base mean salaries are based on standing faculty members at the rank of professor. Excluded are all members of the Faculty of Medicine except basic scientists, and all standing faculty members who are appointed as Clinician Educators. Data Source: AAUP Salary Surveys.

*Universities are ordered from highest to lowest percentage difference for full professors as of 2017-2018. For each year reported, the difference between the Penn mean salary and the mean salary for a comparison university was computed as a percentage of the Penn salary.

Salary figures adjusted using 2007, 2010 and 2013 Runzheimer Living Cost Indices. Indices for Hanover, NH (Dartmouth), and Providence, RI (Brown) are not available

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Associate Professors - Mean ADJUSTED Academic Base Salaries: Percentage Differences*									
Duke	15.6%	7.8%	13.5%	19.4%	16.5%	16.7%	11.8%	14.9%	12.7%
Columbia	-9.7%	-5.1%	-7.5%	-1.6%	7.3%	7.0%	5.9%	6.3%	0.2%
Penn	\$92.5	\$98.2	\$102.8	\$102.4	\$105.1	\$110.1	\$116.4	\$118.7	\$124.1
Princeton	-1.6%	2.3%	0.1%	4.9%	3.3%	1.3%	-0.5%	-0.3%	-0.2%
Yale	-6.8%	-7.1%	-7.2%	-2.9%	-3.0%	-8.2%	-9.5%	-4.9%	-3.5%
Cornell	10.9%	7.7%	6.4%	4.7%	4.4%	2.3%	1.1%	-1.7%	-5.5%
Harvard	-7.5%	-7.5%	-11.6%	-12.7%	-11.6%	-12.7%	-16.8%	-19.5%	-8.1%
MIT	-12.1%	-11.9%	-12.0%	-10.0%	-9.2%	-8.7%	-12.0%	-9.4%	-9.6%
Brown	-12.1%	-7.6%	-9.4%	-5.4%	-5.0%	-5.4%	-8.6%	-9.4%	-10.2%
Stanford	-31.1%	-17.4%	-18.4%	-15.6%	-15.2%	-18.3%	-21.0%	-19.5%	-21.8%
Chicago	0.4%	-3.8%	-3.7%	-0.3%	-4.1%	-4.3%	-3.7%	-9.2%	-24.7%

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assistant Professors - Mean ADJUSTED Academic Base Salaries: Percentage Differences*									
Penn	\$85.9	\$93.2	\$98.0	\$101.4	\$103.8	\$105.2	\$108.4	\$112.1	\$115.4
Duke	8.8%	-4.6%	-0.1%	-2.2%	1.1%	1.5%	2.7%	3.0%	-0.3%
Cornell	1.4%	0.2%	-4.2%	-6.6%	-9.8%	-6.6%	-0.8%	-4.6%	-5.8%
Harvard	-10.9%	-16.1%	-15.7%	-15.9%	-17.2%	-19.2%	-16.8%	-17.2%	-8.2%
Princeton	-20.6%	-19.0%	-20.0%	-20.6%	-17.9%	-16.6%	-17.1%	-17.8%	-14.1%
Columbia	-23.3%	-20.6%	-23.2%	-20.6%	-17.1%	-15.8%	-13.0%	-15.0%	-15.7%
Yale	-12.7%	-17.5%	-19.6%	-18.3%	-20.3%	-18.3%	-17.8%	-16.4%	-15.8%
MIT	-14.2%	-19.3%	-21.1%	-21.2%	-19.8%	-18.5%	-19.5%	-19.3%	-18.8%
Brown	-19.2%	-18.7%	-21.3%	-20.5%	-20.5%	-18.6%	-19.3%	-21.1%	-21.7%
Chicago	1.5%	-6.4%	-9.1%	-12.1%	-13.7%	-9.4%	-9.4%	-10.5%	-21.9%
Stanford	-40.0%	-29.0%	-28.4%	-29.8%	-28.0%	-26.0%	-26.2%	-27.3%	-29.9%

Table 6

FULL PROFESSORS: Median academic base salary percentage increases of faculty continuing in rank who were Penn FULL PROFESSORS for FY2018, along with the first and third quartile salary increases

School/Area	First Quartile (Q1), Median (Md.), and Third Quartile (Q3) Percentage Salary Increases, FY 2017-2018		
	(Q1)	(Md.)	(Q3)
All Schools	2.8%	3.0%	3.5%
Annenberg		3.0%	
Dental Medicine	3.1%	3.3%	5.0%
Design	2.0%	3.0%	3.0%
Engineering & Applied Science	2.5%	3.4%	4.3%
Graduate Education	3.0%	3.0%	3.5%
Humanities (A&S)	2.7%	2.8%	3.3%
Law	3.1%	3.3%	3.5%
Natural Science (A&S)	2.6%	2.8%	3.1%
Nursing	3.0%	3.0%	4.0%
Perelman-Basic Science	2.5%	3.0%	3.5%
Social Policy & Practice	3.0%	3.0%	5.1%
Social Science (A&S)	2.8%	3.0%	3.0%
Veterinary Medicine	3.0%	3.0%	3.0%
Wharton	2.9%	3.3%	4.0%
Budget Guidelines		3.0%	

NOTES: The Budget Guideline is provided for comparison purposes. As per Penn policy, it is a guideline for the salary increment pool for all standing faculty members in each school, but not specifically for each rank.

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

Salary increases include increases from all sources (e.g. merit, market, retention).

The median (Md.) percentage salary increase is the mid-point of all increases within each school and rank (i.e. half of all increases are below the median and half are above).

The difference between the third (Q3) and first quartile (Q1) percentages provides a measure of variability in the percentages increases for each school and rank.

At the lower end of the salary increase percentages, 25% of all increases are below Q1, while 75% are above

Median increases are reported only if the number of faculty members in a given school and rank is five or more, quartile increase are reported only if the number of faculty members is nine or more.

Table 7**ASSOCIATE PROFESSORS: Median academic base salary percentage increases of faculty continuing in rank who were Penn ASSOCIATE PROFESSORS for FY2018, along with the first and third quartile salary increases**

School/Area	First Quartile (Q1), Median (Md.), and Third Quartile (Q3) Percentage Salary Increases, FY 2017-2018		
	Q1	Md.	Q3
All Schools	2.8%	3.0%	3.7%
Annenberg			
Dental Medicine			
Design	2.0%	3.0%	4.0%
Engineering & Applied Science	2.7%	3.2%	4.5%
Graduate Education		3.0%	
Humanities (A&S)	2.8%	2.8%	4.1%
Law			
Natural Science (A&S)	2.6%	2.8%	3.0%
Nursing	3.0%	3.3%	8.0%
Perelman-Basic Science	2.0%	2.9%	3.0%
Social Policy & Practice		3.0%	
Social Science (A&S)	2.8%	3.0%	3.0%
Veterinary Medicine	3.0%	3.0%	3.0%
Wharton	2.6%	3.5%	4.0%
Budget Guidelines +		3.0%	

NOTES: The Budget Guideline is provided for comparison purposes. As per Penn policy, it is a guideline for the salary increment pool for all standing faculty members in each school, but not specifically for each rank.

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

Salary increases include increases from all sources (e.g. merit, market, retention).

The median (Md.) percentage salary increase is the mid-point of all increases within each school and rank (i.e. half of all increases are below the median and half are above).

The difference between the third (Q3) and first quartile (Q1) provides a measure of variability in the percentage increases for each school and rank.

At the lower end of the salary increase percentages, 25% of all increases are below Q1, while 75% are above

Median percentage increases are reported only if the number of faculty members in a given school and rank is five or more, quartile percentage increases are reported only if the number of faculty members is nine or more.

Table 8

ASSISTANT PROFESSORS: Median academic base salary percentage increases of faculty continuing in rank who were Penn ASSISTANT PROFESSORS for FY2018, along with the first and third quartile salary increases

School/Area	First Quartile (Q1), Median (Md.), and Third Quartile (Q3) Percentage Salary Increases, FY 2017-2018		
	Q1	Md.	Q3
All Schools	3.0%	3.0%	3.6%
Annenberg			
Dental Medicine			
Design	2.0%	2.3%	5.1%
Engineering & Applied Science	3.2%	3.8%	4.1%
Graduate Education	3.0%	3.0%	3.0%
Humanities (A&S)	2.8%	2.9%	3.2%
Law			
Natural Science (A&S)	2.8%	3.2%	3.5%
Nursing		3.0%	
Perelman-Basic Science	3.0%	3.0%	3.9%
Social Policy & Practice		3.0%	
Social Science (A&S)	2.9%	2.9%	3.0%
Veterinary Medicine		3.0%	
Wharton	3.0%	3.3%	4.1%
Budget Guidelines +		3.0%	

NOTES: The Budget Guideline is provided for comparison purposes. As per Penn policy, it is a guideline for the salary increment pool for all standing faculty members in each school, but not specifically for each rank.

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

Salary increases include increases from all sources (e.g. merit, market, retention).

The median (Md.) percentage salary increase is the mid-point of all increases within each school and rank (i.e. half of all increases are below the median and half are above).

The difference between the third (Q3) and first quartile (Q1) provides a measure of variability in the percentage increases for each school and rank.

At the lower end of the salary increase percentages, 25% of all increases are below Q1, while 75% are above

Median percentage increases are reported only if the number of faculty members in a given school and rank is five or more, quartile percentage increases are reported only if the number of faculty members is nine or more.

Table 9

Mean academic base salary of Penn standing faculty members who continued in rank by rank

Rank/Academic Year/Metric			Amount	Not Weighted	Weighted
Professor	2013-2014	Mean	\$194,443	1.66	1.83
		Median	\$176,072	1.86	1.84
	2014-2015	Mean	\$200,643	1.67	1.84
		Median	\$182,017	1.84	1.81
	2015-2016	Mean	\$207,440	1.71	1.84
		Median	\$187,571	1.88	1.83
	2016-2017	Mean	\$213,613	1.72	1.84
		Median	\$193,812	1.93	1.85
	2017-2018	Mean	\$221,377	1.75	1.85
		Median	\$200,460	1.92	1.85
Associate Professor	2013-2014	Mean	\$119,064	1.02	1.22
		Median	\$106,900	1.13	1.24
	2014-2015	Mean	\$124,375	1.04	1.24
		Median	\$109,283	1.11	1.23
	2015-2016	Mean	\$130,872	1.08	1.25
		Median	\$113,300	1.14	1.26
	2016-2017	Mean	\$135,314	1.09	1.24
		Median	\$115,816	1.15	1.27
	2017-2018	Mean	\$137,758	1.09	1.24
		Median	\$119,710	1.15	1.25
Assistant Professor	2013-2014	Mean	\$117,100	1.00	1.00
		Median	\$94,480	1.00	1.00
	2014-2015	Mean	\$119,825	1.00	1.00
		Median	\$98,728	1.00	1.00
	2015-2016	Mean	\$121,590	1.00	1.00
		Median	\$99,535	1.00	1.00
	2016-2017	Mean	\$123,989	1.00	1.00
		Median	\$100,519	1.00	1.00
	2017-2018	Mean	\$126,802	1.00	1.00
		Median	\$104,498	1.00	1.00

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

The data are weighted by the number of continuing faculty members at each rank in each school.

Table 10

**Variability of academic base salary for faculty who continued in rank:
first, second and third quartile median salary by rank and year**

Rank/Academic Year	Q1	Median	Q3	IQR	IQR-to-Median Ratio	# of Areas
Professor						
2013-2014	\$145,500	\$176,072	\$232,093	\$86,593	0.49	14
2014-2015	\$149,037	\$182,017	\$240,350	\$91,313	0.50	14
2015-2016	\$152,200	\$187,571	\$249,474	\$97,274	0.52	14
2016-2017	\$154,752	\$193,812	\$257,346	\$102,594	0.53	14
2017-2018	\$160,600	\$200,460	\$269,613	\$109,013	0.54	14
Associate Professor						
2013-2014	\$94,800	\$106,900	\$123,500	\$28,700	0.27	13
2014-2015	\$98,088	\$109,283	\$129,878	\$31,790	0.29	14
2015-2016	\$101,414	\$113,300	\$134,386	\$32,972	0.29	14
2016-2017	\$105,210	\$115,816	\$138,339	\$33,129	0.29	13
2017-2018	\$108,932	\$119,710	\$140,858	\$31,926	0.27	13
Assistant Professor						
2013-2014	\$83,659	\$94,480	\$161,000	\$77,341	0.82	14
2014-2015	\$85,807	\$98,728	\$164,375	\$78,568	0.80	14
2015-2016	\$87,009	\$99,535	\$165,000	\$77,991	0.78	13
2016-2017	\$89,820	\$100,519	\$164,250	\$74,430	0.74	13
2017-2018	\$92,739	\$104,498	\$162,500	\$69,761	0.67	13

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

Table 11

Percentage Salary Increase Distribution of Faculty Who Continued in Rank by sex and rank

Rank/Sex		First Quartile (Q1), Median (Md.), and Third Quartile (Q3) Percentage Salary Increases, FY 2017-2018		
		Q1	Md.	Q3
Professor	Men	2.8%	3.0%	3.6%
	Women	2.8%	3.0%	3.4%
Associate Professor	Men	2.7%	3.0%	3.5%
	Women	2.8%	3.0%	4.0%
Assistant Professor	Men	3.0%	3.1%	4.0%
	Women	3.0%	3.0%	3.3%

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

Table 12

**Mean academic base salary of Penn standing faculty members who continued in rank by rank and sex.
Faculty on paid leave or unpaid leave are reported at their full salary.**

Rank/Academic Year /Metric		Unweighted			Weighted by School/Discipline			Men - Women	
		Women	Men	% Difference	Women	Men	% Difference	Unweighted	Weighted
Professor									
2013-2014	Mean	\$183,418	\$197,811	7.8%	\$192,926	\$197,811	2.5%	\$14,393	\$4,885
	Median	\$169,373	\$179,000	5.7%	\$192,634	\$194,587	1.0%		
2014-2015	Mean	\$188,619	\$204,309	8.3%	\$199,277	\$204,309	2.5%	\$15,690	\$5,032
	Median	\$175,975	\$185,000	5.1%	\$197,029	\$200,227	1.6%		
2015-2016	Mean	\$198,783	\$210,066	5.7%	\$208,639	\$210,066	0.7%	\$11,283	\$1,427
	Median	\$181,442	\$190,000	4.7%	\$203,478	\$205,589	1.0%		
2016-2017	Mean	\$202,768	\$216,925	7.0%	\$211,327	\$216,925	2.6%	\$14,157	\$5,598
	Median	\$184,871	\$195,432	5.7%	\$208,079	\$211,620	1.7%		
2017-2018	Mean	\$210,264	\$224,782	6.9%	\$221,277	\$224,782	1.6%	\$14,518	\$3,505
	Median	\$191,455	\$202,303	5.7%	\$214,980	\$218,668	1.7%		
Associate Professor									
2013-2014	Mean	\$108,925	\$125,067	14.8%	\$119,010	\$125,067	5.1%	\$16,142	\$6,057
	Median	\$100,127	\$112,750	12.6%	\$121,612	\$123,634	1.7%		
2014-2015	Mean	\$111,971	\$132,825	18.6%	\$121,576	\$132,825	9.3%	\$20,854	\$11,249
	Median	\$103,625	\$118,076	13.9%	\$122,624	\$130,632	6.5%		
2015-2016	Mean	\$117,024	\$139,565	19.3%	\$127,591	\$139,565	9.4%	\$22,541	\$11,974
	Median	\$107,193	\$123,075	14.8%	\$129,967	\$136,475	5.0%		
2016-2017	Mean	\$125,640	\$141,234	12.4%	\$138,505	\$141,234	2.0%	\$15,594	\$2,729
	Median	\$112,232	\$123,247	9.8%	\$140,304	\$137,831	-1.8%		
2017-2018	Mean	\$132,170	\$141,178	6.8%	\$141,845	\$141,178	-0.5%	\$9,008	-\$667
	Median	\$117,815	\$124,877	6.0%	\$141,123	\$139,411	-1.2%		
Assistant Professor									
2013-2014	Mean	\$109,758	\$122,033	11.2%	\$117,788	\$122,033	3.6%	\$12,275	\$4,245
	Median	\$89,400	\$100,435	12.3%	\$115,358	\$118,212	2.5%		
2014-2015	Mean	\$112,695	\$124,649	10.6%	\$121,025	\$124,649	3.0%	\$11,954	\$3,624
	Median	\$92,716	\$103,128	11.2%	\$118,706	\$122,042	2.8%		
2015-2016	Mean	\$113,120	\$127,585	12.8%	\$123,750	\$127,585	3.1%	\$14,465	\$3,835
	Median	\$95,209	\$106,003	11.3%	\$120,728	\$124,284	2.9%		
2016-2017	Mean	\$114,342	\$131,109	14.7%	\$127,957	\$131,109	2.5%	\$16,767	\$3,152
	Median	\$96,914	\$108,265	11.7%	\$123,935	\$126,728	2.3%		
2017-2018	Mean	\$117,892	\$134,178	13.8%	\$134,366	\$134,178	-0.1%	\$16,286	-\$188
	Median	\$100,131	\$112,231	12.1%	\$129,538	\$130,074	0.4%		

NOTES: All salaries are converted to a nine-month base. Academic base salary increases pertain to all Penn standing faculty members with an appointment at the time of the fall census for both years. Faculty members on paid leave or unpaid leave are reported at their full salaries.

Excluded are all members of the Faculty of Perelman except basic scientists, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Policy & Practice), faculty members on phased retirement, and Deans of all Schools.

Female faculty members are weighted using male weights. Male weights are calculated as a ratio of male faculty in each school/area to the total number of male faculty at Penn. Percent difference is calculated as the difference between male and female salaries divided by the female salary. Negative percent differences occur when the female salary exceeds the male salary.

Table 13

Employer Contributions to Retirement Accounts and to Dependent Undergraduate Tuition at Penn and Ivy Plus Peer Group

University	Maximum Employer Contribution to Retirement Accounts*	Dependent UG Tuition Benefit to Attend home Institution#	Dependent UG Tuition Benefit to Attend Other Institution#
Penn	9%°	75% (\$37,530)^	100% (up to \$19,688)
Brown	10%	22% (\$12,168)	100% (up to \$12,168)
Carnegie Mellon	8%	100% (\$54,244)	100% (up to \$32,546)
Chicago	8%	75% (\$41,569)	100% (up to \$41,569)
Columbia	9-11.2%†	100% (\$61,948)	50% (up to \$30,974)
Cornell	10%	50% (\$27,594)	30% (up to \$16,556)
Dartmouth	10%	0	0
Duke	None	75% (\$40,320)	100% (up to \$40,320)
Harvard	10%	0	0
Michigan	10%	0	0
MIT	10%	100% (\$51,520)	up to \$25,760
NYU	10%	90-100% (\$46,645-\$51,828)	up to \$6,373
Princeton	9.3-12.45%†	37% (\$18,150)	50% (up to \$18,150)
Stanford	10%	50% (\$25,352)	50% (up to \$25,352)
Yale	10-11.38%†	32% (\$17,098)	50% (up to \$17,098)
Median Max Benefit (excluding Penn)	10%	\$26,473	\$17,624

*Data as of July 2018. Service minimums to qualify vary by institution. Combined contributions to 403(b) and 401(a) accounts for oldest age bracket; only salary up to \$280,000 is eligible. A portion requires employee contribution to qualify.

†Rate differs above and below Social Security Wage base of \$128,700

°Penn highest age bracket is age 40 and over

^Amount includes both Tuition and Technology Fee

#Data as of July 2018. Conditions to qualify vary by institution. Some benefits include tuition only, others include fees. At Duke, only tuition above \$7,020 is eligible.