2001-2002 Annual Report

Senate Committee on the Economic Status of the Faculty

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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 on the current economic status of the faculty as based on salary data. The report is organized in terms of three broad concerns:

- The salary setting process at Penn: the sources of funds for faculty salaries and the how annual salary increase decisions are made.
- External comparisons: the competitiveness of faculty salaries at Penn in comparison with faculty salaries at other universities.
- Internal comparisons: variability of faculty salaries within Penn, and sources of possible salary inequity that might occur within observed variability.

Major sections of this report are devoted to each of these three topics, while Section VI is devoted to SCESF's overall conclusions about the economic status of the faculty.

In accordance with the procedures adopted by the Senate Executive Committee in Spring 1999, we do not offer recommendations here for development of faculty salary policy. Instead, we report in Section VII the present status of committee recommendations, as adopted by the Senate Executive Committee and submitted to the Provost in January 2002, and the Provost's response to recommendations made in this year's report.

In performing its responsibilities, SCESF has been cognizant of Penn's current salary policy as stated by the President, Provost, and Executive Vice President (*Almanac* April 17, 2001). Penn's guiding principle in salary planning is to pay faculty and staff (a) competitively, (b) in relationship to the markets for their services and prevailing economic conditions, (c) to acknowledge their contributions to the University, and (d) to help Penn remain a strong and financially viable institution.

In studying faculty salaries for this report, SCESF has benefited greatly by access to detailed salary data (excluding, of course, individual faculty salaries) that have been provided by Penn's central administration and several schools (specifically the Nursing, Veterinary, Medical, and Dental schools). Our understanding, both of Penn's competitiveness with peer institutions in faculty salary levels and of faculty salary variability within Penn, has been enhanced by access to this information and by the assistance of those who produced it. The SCESF acknowledges this cooperation with appreciation.

II. Resources for Faculty Salaries and Annual Increases

Faculty salaries are the product of a two-step process:

1. *Setting Salary Levels:* Faculty salary levels are set at the time of initial appointment by the dean of the faculty making the appointment.
2. *Annual Salary Increases:* Faculty salary levels are normally increased annually by a process described below. Such salary increases are ordinarily based on academic merit. Some annual increases are also the result of promotion in rank and equity adjustments.

All funds for faculty salaries come from each school's operating budget; there is no central fund earmarked specifically for faculty salaries. Most of each school's resources are raised in accordance with the principles of Penn's Responsibility Center Budgeting System (RCBS).[1] In addition, subvention is distributed to schools by Penn's central administration. Of these resources, each School makes a certain amount available for faculty salaries in three respects: (a) sustaining existing faculty appointments, (b) providing annual salary increases for continuing faculty members, and (c) creating salary funding for new faculty positions. In addition, schools must provide funds for employee benefits that approximate 30% of all such faculty salary expenditures.

Annual salary increase recommendations for continuing faculty members are made by Department Chairs (in schools with departments) and by Deans, with review and oversight by the Provost (see the statement of the "Salary Guidelines For 2001-02" as published in *Almanac* April 17, 2001). Penn's President, Provost, and Executive Vice President set an upper limit on a "pool percentage" for salary increases. For FY 2002, schools were authorized to award, as salary increases, a pool of up to 3.5% of the FY 2002 salaries of continuing faculty members. The recommended salary increase range was 1% to 6%, with Deans being obligated to consult with the Provost about any increases outside this range. Deans could supplement the pool by 0.5% without the Provost's approval, and by more than this with the Provost's approval. To address possible inequity in faculty salaries, Deans were asked to "pay particular attention to any faculty who meet standards of merit but whose salaries for various reasons may have lagged over the years."

Within this framework of available funds, Department Chairs and Deans had the responsibility to recommend salary increases to the Provost for each continuing faculty member based on general merit, including recognition of outstanding teaching, scholarship, research, and service. In addition, the Provost reviews the Deans' faculty salary recommendations "to insure that raises on average reflect market conditions in each discipline."

III. Penn Faculty Salaries: External Comparisons

Average Penn Faculty Salaries (i.e., academic year base salaries) are compared with three types of external indicators in the following sections: (a) growth in the Consumer Price Index (CPI), (b) average faculty salaries by rank at other universities as reported by annual surveys conducted at the school level, and (c) average salaries of full professors for a sample of 19 public and private research universities selected as comparable to Penn from among those included in the "Annual Report on the Economic Status of the Profession" issued by the American Association of University Professors (AAUP). As a methodological note and unless otherwise specifically stated, all faculty salary information discussed in this report refers to the aggregated "academic year base salary" of individual faculty members whether salaries are paid from General Operating Funds and/or from Designated Funds.[2] In addition, all salary data reported exclude members of the Faculty of Medicine (except for basic scientists in the Medical school that are now part of this report) and all standing faculty members who are appointed as Clinician Educators from four other schools that have such positions (Dental Medicine, Veterinary Medicine, Nursing, and Social Work).

A. Comparisons with Growth in the Consumer Price Index (CPI)

Faculty salary increases by rank, averaged for all schools except Medicine, for FY 2000, FY 2001, FY 2002, and compound cumulative for FY 1992-01, are shown in Table 1 in comparison with comparable data for the CPI (UScityaverage) and Penn budget guidelines. The nation has remained in a period of low inflation (3.7% for FY 2000 and 3.2% in FY 2001, the most recent CPI data available). Two important facts to report, and those that answer one of the concerns from last year's report are that: (a) for all ranks, the FY02 salary increases (on average) were considerably higher than CPI (albeit the previous year's) and represent the highest amounts in the past 10 year period. Secondly, the mean increases are substantial in absolute value, and even exceed the faculty guideline upper bound of 6.0%. We believe that such a trend, if it continues, will put Penn in a strong competitive position and allow us to attract the highest quality researchers and teachers.

The most impressive salary increase percentages continue to be the cumulative compound salary increments over the 10-year period from FY 1992 through FY 2001 as also seen in Table 1. On the whole (all ranks combined), cumulative mean Penn faculty salary increments during this 10-year period were about twice the growth in the CPI (UScityaverage).

Furthermore, the mean compound cumulative growth in faculty salaries over the 10-year period exceeded Penn's budget guidelines by a considerable margin. These guidelines refer to the centrally recommended salary pool percentage. What has happened is that many (perhaps all) of the Deans of Penn's schools have added considerable additional school resources to the recommended cumulative base pool for salary increases. If we estimate the compound cumulative increase over the 10-year period for all ranks combined to be roughly 65% (the exact number is not available but it is 59.6 for full professors, 64.1% for associate professors and 68.7% for assistant professors), the cumulative compound *additional* contribution of schools to the salary pool must have approximated 20% (65% minus the

[1] The 1998-1999 and 1999-2000 Reports of the Senate Committee on the Economic Status of the Faculty contain overviews of Penn's Responsibility Center Budgeting System.

[2] These terms are used in Penn's Responsibility Center Budgeting System. See the 1999 or 2000 report on the Economic Status of the Faculty for a description of this system.

recommended budget guideline of 44.5%). Thus, it is apparent that both Penn's central and school administrations have made substantial joint efforts over the years to raise the average level of faculty salaries well in excess of the rate of inflation in the CPI during the past 10 years, and in addition to exceed the University guideline.[3]

The overall increases in faculty salary by rank in comparison with growth in the CPI, as seen in Table 1, are reported by school (including three disciplinary areas of SAS) in Table 2 for FY 2000, FY 2001 and FY 2002. While the raises in Table 1 indicate a good trend in the salaries, Table 2 demonstrates a fairly reasonable basis for concern. Our committee's concern lies in a number of basic areas: (1) Only 25% of Annenberg's faculty has salaries that exceeded CPI. Let us note that one possible explanation for this is the extremely high rate of salary increases that occurred between 1996-2002 (e.g. 42.2% for professors) for Annenberg and that 2002 may have been a re-adjustment. This is partially substantiated by looking at the results in Table 6, in which we see that the median raise for Annenberg Full professors was below CPI, with small variation (small interquartile range), (2) No school had 90% of its faculty above CPI. Now, while this is very explainable as CPI was 3.2% (overall) and 3.3% for Philadelphia, and the middle of the salary increase pool was 3.5%, these lower percentages represent a significant departure, as one can see in Table 2, from past years. Specifically, it is disappointing to see that 10 of the 14 schools/areas awarded a salary increase below the CPI growth percentage to more than 20 percent of all continuing standing faculty members. In particular, all schools except for Dental Medicine, Humanities (SAS), Veterinary Medicine, and Wharton had more than 20% of its faculty receive salary increases below CPI. This is especially regrettable because an increase of less than the CPI growth percentage for an individual faculty member represents an effective reduction in the purchasing power of a salary.[4]

In addition to the cross-sectional concerns in salary raises versus CPI, there are also a number of concerns regarding the trend in percentage increase in salary versus CPI. As seen in Table 3, for full professors, there is a significant reduction (defined as that over 5%) in percentage of faculty receiving raises above CPI (for the 1996-2002 time period) for the Education School, Engineering and Applied Science, Graduate Fine Arts, Law, Natural Science (SAS), and Social Science (SAS) versus the 1994-2000 time period. There is another area that we believe deserves a closer look by the administration.

SCESF recognizes that there are legitimate reasons for individual faculty members to be awarded increments less than the growth in the CPI. For example, in a particular year, the salary increment pool many only approximately, or even be less than, the rate of growth in the CPI. We believe that this may play a very significant role in the low numbers observed in this report.

Furthermore in a small department or school, a few promotions or market adjustments needed to retain a valued faculty member could obligate a disproportionate share of an existing increment pool, thereby leaving little to award to other faculty members in the unit. Finally, some faculty members may be sufficiently lacking in merit to justify an increment exceeding the CPI growth.

Nonetheless, if the salary increment pool available (including the amount which is supplemented by the various Deans) in each school/area is well in excess of CPI growth (as it has been for FY 2002), it is the judgment of SCESF that no individual faculty member should receive less than a cumulative salary increase equal to, or exceeding, growth in the CPI (defined over some "to be discussed" time horizon) unless his or her performance has been unsatisfactory over a substantial period of that time horizon. It therefore seems possible that the cumulative salary increments received by some continuing full professors have been inequitably low, at least in part, and we would also like to explore this for all ranks.

[3] In making this observation, we realize that the centrally-recommended guideline of 3.5% for FY 2000 salary increases was stated as a maximum. Depending upon a school's financial condition, a lower pool percentage could be awarded.

[4] Information about growth in the CPI lags decisions about awarding salary increases by at least a year. For example, in deciding faculty raises in May and June of a particular fiscal year (e.g., FY 2000) for the following fiscal year (e.g., July 2000 through June 2001), information about the actual growth in the CPI during the fiscal year for which a salary increase is decided will not be available until about 18 months later.

B. Comparisons with Peer Universities Using MIT Survey Data

The best currently available salary data from other institutions of higher education are provided by the MIT annual survey of a group of approximately 25 private and public research universities (the sample size varies somewhat from year to year, for example it was 24 in the previous report). Mean faculty salaries by rank (professor, associate professor, assistant professor) and discipline have been made available to the SCESF for analysis as of the Fall Semesters for the years 1998 through 2001. These salary data are reported for the following academic fields:

- Natural Sciences (at Penn, represented by SAS departments)
- Humanities &Social Sciences (at Penn, represented by SAS departments)
- Engineering (at Penn, represented by SEAS)
- Architecture (at Penn, represented by GSFA[5])
- Management (at Penn, represented by Wharton)

Even though the MIT sample varies somewhat from year to year, comparisons reported here have been made *only* with universities that submitted salary data consistently during the four year period examined. The MIT sample includes major private universities, as well as a number of highly regarded public research universities and one college (Williams). However, the specific sample of universities varies with the academic fields listed above. Each of these samples is described in turn below.

One concern with this year's list of schools, as compared to last year, is that the number of schools has shrunk in every single discipline area. Now, assuming these drop-outs are random, then they should not influence Penn's relative rank (in the long term). However, if the schools that dropped out are those that were "ahead" of Penn, then this would artificially make Penn look better than it really is. This is something we will have to keep an eye on going forward.

1. The MIT Sample of Universities

Comparison Sample for Natural Sciences, Social Sciences, and Humanities: The MIT sample for academic disciplines in these areas includes 21 institutions for the Natural Sciences, and 20 institutions for the Social Sciences and the Humanities. Twenty of the institutions are identical (with UC Berkeley being included for Natural Sciences and not for the other): the California Institute of Technology, Carnegie-Mellon, Columbia, Cornell, Georgia Institute of Technology, Harvard, Massachusetts Institute of Technology, Princeton, Purdue, Rice, Stanford, California (Los Angeles), California (San Diego), California (Santa Barbara), Illinois, Pennsylvania, Rochester, Texas, Wisconsin (Madison), and Yale. Note that Minnesota was the addition from last year's report. These universities are, to a large extent, comparable to Penn. The sample would be improved by the participation of the University of Chicago, Duke, and NYU which the SCESF believe are significant peer institutions. There is one dimension on which the sample may not be completely comparable to Penn: half of the institutions are state universities. Moreover, four of the state universities are in the University of California system. However, as long as one is aware of the relatively large weight public universities have in this survey, the sample of universities is appropriate for comparison purposes.

Comparison Sample for Engineering: The MIT sample for engineering includes 19 institutions: the California Institute of Technology, Carnegie-Mellon, Columbia, Cornell, Georgia Institute of Technology, Massachusetts Institute of Technology, Princeton, Purdue, Rice, Stanford, California (San Diego), California (Santa Barbara), Illinois, Pennsylvania, Rochester, Texas, Wisconsin (Madison), and Yale. In the judgement of SCESF, meaningful salary comparisons can be made with this sample of universities because it is sufficiently representative of engineering schools elsewhere that are considered to be peers of Penn's School of Engineering and Applied Science (SEAS).

Comparison Sample for Architecture: The MIT sample for architecture includes either 14, 12, or 13 institutions for full professors, associate professors, and assistant professors respectively: Carnegie-Mellon, Columbia, Cornell, Georgia Institute of Technology, Harvard, Massachusetts Institute of Technology, Princeton, Rice, California (Los Angeles), Illinois, Pennsylvania, Texas, Wisconsin (Madison), and Yale. In the judgment of SCESF, meaningful salary comparisons can be made with this sample of universities because it is sufficiently representative of architecture schools elsewhere that are considered to be peers of Penn's Graduate School of Fine Arts (GSFA).

[5] GSFA also includes Departments of City and Regional Planning, Landscape Architecture and Regional Planning, and Fine Arts.

Comparison Sample for Management: The MIT sample for management includes 15 institutions: Carnegie-Mellon, Columbia, Cornell, Georgia Institute of Technology, Harvard, Massachusetts Institute of Technology, Purdue, Rice, Stanford, California (Los Angeles), Illinois, Pennsylvania, Rochester, Texas, and Yale. In the judgment of SCESF, meaningful salary comparisons can be made with this sample of universities because it is sufficiently representative of management schools elsewhere that are considered to be peers of Penn's Wharton School.

2. Salary Comparisons: Penn's Competitive Standing

The most meaningful comparisons of mean faculty salaries at Penn with those at other universities in the MIT sample are broken out by academic field and rank (Table 4). However, as a broad overall generalization for the four schools at Penn included in the MIT survey as weighted by faculty size, it is fair to conclude that Penn's mean faculty salaries (for full and associate ranks) were above the mean of the MIT sample as of the Fall 2001. However, for the assistant professor ranks, the weighted average indicates a salary base right at the mean of the comparison schools. While, of course, average (or slightly above average) is not bad if Penn has the aspirations of being average, we hope that it is in an area in which the administration could take a closer look. That is we believe that if salaries remain at these levels, Penn will have a hard time attracting and retaining the best and the brightest faculty.

Looking across the schools at Penn at the full professor level, we note very little change in relative standing in the last five years with Architecture slightly improved, Engineering slightly worse, Humanities and Social Science no change, Management no change, and Science no change. Therefore, while our full professors have not lost ground overall, they have not gained ground either.

At the associate professor level (across Penn's schools), we see a moderately positive change for Engineering, a slight net gain for Humanities and Social Science, a strong positive gain for Management, and a strong positive gain for Science. Overall, the competitive standing for associate professors at Penn, across schools, seems to have improved.[6]

Finally, at the assistant professor level, we see a slight improvement in rank for Architecture and for and for Engineering, while no major changes for Humanities and Social Science, Management, or Science. Unfortunately, as detailed below, some of these schools have remained below the average, and hence little relative improvement in positioning is a reason for some concern.

In our 2001 report, SCESF provided information about mean salary levels for each academic field included in the MIT survey as of the Fall of 1997 through 2000. This information is now updated for Fall 2001 in Table 4 in terms of Penn's rank order of mean salary levels within the MIT sample. The multi-year data of Table 4 are comparable year-to-year in that the same set of universities (for each academic field) is used for each of the years reported. Thus, none of the trends in rank orders observed over time can be attributed to instability in the sample size or composition.

SCESF has analyzed both the rank order salary data of Table 4 and the more detailed salary data (e.g., frequency distributions) from which the rank orders were computed. Based on our comprehensive study of data from the MIT Salary Survey (including the frequency distributions data not released for publication), we describe below, in separate paragraphs for each academic field and rank, the two most salient points: (a) the competitive position of a Penn mean salary level as of Fall 2001 and (b) the change (if any) in this competitive position during the past five years.

Full Professors in the Natural Sciences: As of 2001-2002, the mean salary of full professors in the natural sciences at Penn ranked 10th of 20 universities in the relevant MIT sample, although 1 of the 9 schools above Penn was very close. Accordingly, Penn's current competitive position within the MIT sample is best described as average. This position of Penn's mean salary in the natural sciences represents very little difference in comparison to last year, and to the last five years overall.

Full Professors in the Social Sciences and Humanities: As of 2001-2002, the mean salary of full professors in the social sciences and humanities at Penn ranked 8th of 20 universities in the relevant MIT sample, although 2 of the 7 universities above Penn were less than 2% higher. Accordingly, Penn's current competitive position in the widely distributed MIT sample in this academic field is best described as somewhat above average. This competitive position of Penn's mean salary in the social sciences and humanities has been stable during the past five years, and maybe improving slightly.

Full Professors in Engineering: As of 2001-2002, the mean salary of Penn's engineering professors ranked 11th of 19 universities in the relevant MIT sample, although 3 of the 10 universities above Penn were less than 2% higher. The mean engineering salaries in the MIT sample are not dispersed widely (all falling within 15% of the median), and have become even more tightly bunched during the past five years. The import of this is that the Penn mean salary, though average, is still reasonably close to those above. Nonetheless, the current competitive position of Penn's mean salary in engineering represents a slight decline in its competitive position since 1996-97.

Full Professors of Architecture: As of 2001-2002, the mean salary of Penn's GSFA professors was competitive in that it ranked 5th of 14 universities in the relevant MIT sample. However, two of the four universities with higher salaries exceeded Penn's level by a considerable amount. In comparison with the entire sample of 14 universities reporting data for architecture, the mean GSFA salary leads a narrowly disbursed middle group. In general, the current competitiveness of the GSFA mean salary represents a noticeable[7] improvement since 1996-97.

Full Professors of Management: As of 2001-2002, the mean salary of Penn's Wharton professors ranked 4th of 15 universities in the relevant MIT sample. During the past five years, the dispersion of mean salaries has declined noticeably—the significance of which is that the Wharton mean salary in the MIT sample is nonetheless close to the majority of those above (i.e., the mean Wharton salary is reasonably competitive with most of the highest offered elsewhere). The current Wharton mean salary represents a noticeable improvement in its competitive position since 1996-97. However, one point of concern is the drop in size from 18 academic institutions in 2000-2001 to 15 in 2001-2002. As it appears that at least one of these may be from the high end, this brings into question the stability of these findings. We hope that the amount of fluctuation in the comparison sample does not continue at this pace.

Associate Professors in the Natural Sciences: As of 2001-2002, the mean salary of associate professors in the natural sciences at Penn ranked 4th of 20 universities in the relevant MIT sample, although 1 of the 3 universities above Penn were less than 2% higher. The competitive position of the Penn mean salary in the natural sciences appears in good shape, and has improved slightly over the last 5 years.

Associate Professors in the Social Sciences and Humanities: As of 2001-2002, the mean salary of associate professors in the social sciences and humanities at Penn ranked 4th out of 20 universities in the relevant MIT sample. Accordingly, Penn's current competitive position in the MIT sample in this academic field is well above average, and, in fact, has improved considerably since FY 1996-1997.

Associate Professors in Engineering: As of 2001-2002, the mean salary of associate professors in engineering at Penn ranked 6th of 19 universities in the relevant MIT sample, with 1 of the 5 universities above Penn less than 2% higher. Accordingly, Penn's current competitive position in the MIT sample in this academic field is adequate. The competitive position of the Penn mean salary in engineering has been reasonably stable since 1996-97.

Associate Professors of Management: As of 2001-2002, the mean salary of associate professors at Penn's Wharton School ranked 4th of 15 universities in the relevant MIT sample, although one of the 3 universities above Penn was virtually identical. Accordingly, Penn's current competitive position in the MIT sample in this academic field is somewhat above average. The current Wharton mean salary represents a noticeable improvement in its competitive position since 1996-97. The one area of concern is that the MIT sample now only represents 15 schools for associate professors, down from 18 in previous years. We do not believe that this instability in the comparability of the samples negates the statement regarding Penn's competitiveness. However, we should try and keep this sample as consistent as possible.

[6] For the purpose of describing Penn's competative salary position, mean salaries at other universities are considered to be roughly equivalent to a Penn mean salary if they are within 2% (plus or minus) of the Penn salary.

[7] The word "noticeable" is used here to refer to a change of 3% to 5% in the salary data over time whereas the word "considerable" is used to describe a change of 6%, or more, in the salary data over time. Salary data that change only 0% to 2% over time are regarded as stable.

Assistant Professors in the Natural Sciences: As of 2001-2002, the mean salary of assistant professors in the natural sciences at Penn ranked 9th of 20 universities in the relevant MIT sample, although 2 of the 8 universities above Penn are less than 2% higher. Even so, Penn's current competitive position within the MIT sample is best described as average because the Penn salary was very close to the median of the sample. The current competitive position of the Penn mean salary in the natural sciences has been stable since 1996-97.

Assistant Professors in the Social Sciences and Humanities: As of 2001-2002, the mean salary of assistant professors in the social sciences and humanities at Penn ranked 9th of 22 universities in the relevant MIT sample, although one of the 8 universities above Penn was less than 2% higher. Penn's current competitive position in the MIT sample in this academic field has improved from considerably below average in FY 1999-2000 to average. In the longer term, the competitive position of the Penn mean salary in the social sciences and humanities was about the same as in 1996-97.

Assistant Professors in Engineering: As of 2001-2002, the mean salary of assistant professors in engineering at Penn ranked 13th of 19 universities in the relevant MIT sample, although 4 of the 12 universities above Penn were less than 2% higher. Because mean salaries are tightly bunched at the lower end of the distribution, Penn's mean salary in this academic field is less than 3% below the median. However, the competitive position of the Penn mean salary in engineering has improved noticeably since FY 1999-2000 and was reasonably close to that of 1996-97.

Assistant Professors of Architecture: As of 2001-2002, the mean salary of assistant professors in Penn's GSFA ranked 10th of 13 universities in the relevant MIT sample, although 1 of the 9 universities above Penn was less than 2% higher. Thus, Penn's mean salary in this academic field is not particularly competitive in the MIT sample. In addition, the competitive position of the current GSFA mean salary has declined noticeably since 1996-97.

Assistant Professors of Management: As of 2001-2002, the mean salary of assistant professors in Penn's Wharton School ranked 5th of 15 universities in the relevant MIT sample, although one of the 4 universities above Penn was less than 2% higher. Accordingly, Penn's current competitive position in the MIT sample in this academic field is somewhat above average. The competitive position of this Wharton mean salary has improved noticeably since 1996-97.

3. General Conclusions about Penn's Competitive Standing

As of academic year 2001-2002, the competitiveness of Penn's mean salary levels varies greatly across academic fields, and by professorial rank within fields. Only Wharton's and humanities and social sciences mean salaries are clearly above average across all three ranks. Similarly, the mean salary of full professors in GSFA is above average, while that of assistant professors ranks only 10th out of 13 in the MIT sample, and given that it is below the median, this is an area for concern. Likewise, the mean salary of Penn's assistant professors in engineering lags well behind the competition.

In summary, there certainly is much room for general improvement in the competitiveness of Penn mean salary levels. How much improvement should be expected is a matter of judgement, but it is reasonable to expect that the general competitive levels attained for full professors in 1996-97 should be regained and that the competitive level of assistant professor salaries should be improved considerably (with the possible exception of Wharton and natural sciences.).

Overall, this is a more promising overview of Penn's competitiveness by academic field and rank than presented in SCESF's 2001 *Annual Report* because some improvement in competitiveness since last year (FY 2000-2001) was observed in several areas [assistant professors in architecture, associate and assistant professors in engineering, all levels in the humanities and social sciences, and all levels in the natural sciences]. The administration should be lauded for this improvement, however there is room to go.

In general, Penn has been aggressively increasing faculty salaries during the past four years as judged by its own standards (as seen in the annual percentage increases). Therefore, the explanation for the stability (and lack of improvement) over five years in the competitive position of Penn's salaries (as seen in MIT survey data), when there are inequities, must be that our competition is increasing faculty salaries at a considerably higher rate than Penn. That is, in spite of Penn's efforts to improve faculty salary levels, our competitive position has declined in some areas because other universities are even more aggressively increasing faculty salaries.

C. Comparisons with Other Universities for the Health Schools

SCESF has been able to review cross-university comparative salary data for the Schools of Dental Medicine and Nursing. Note that the school of Veterinary medicine participated in 2000-2001, but has not this year. We are quite concerned by that, and understand that there were some issues regarding what was reported from Veterinary Medicine that may have led to their departure. We sincerely hope the Provost's office in future years tries to convince the Vet school as to the benefits to them of this external tracking by SCESF. The Committee appreciates the cooperation of the Office of the Provost and the Deans of the Faculties of these two schools that have made these possible. We are all concerned at the lack of external comparison data provided to us for the School of Medicine, basic scientists. As we believe this data is obtainable, we hope to receive it in the future.

1. School of Dental Medicine

With respect to the mean salary levels of faculty members at Penn's School of Dental Medicine, comparative data are available from a salary survey for 1998-99, 1999-00, and 00-01 conducted by the American Association of Dental Schools (AADS). Accordingly, Penn salaries can be compared to salary norms based on a sample of approximately 50 schools of dental medicine (the exact size of the sample varies slightly by year). The salary norms published include the 25th, 50th, and 75th percentile salaries, along with the mean salary, of the sample of about 50 schools (including Penn). Separate norms are published for dental schools in the public and private sectors, as well as combined. The salary norms are then reported separately by AADS for administration, clinical science, basic science, behavioral science, allied education, and research.

Though the published salary norms obscure the identification of participating universities, the names of the approximately 50 universities in the sample are reported.[8] SCESF has been informed that five of Penn's main competitors are included among the approximately 50 universities participating in the survey.

The data recorded by the dental salary survey differs from the standard definition of salary used in this report (i.e., the academic base salary of standing faculty members excluding clinician educators) in the following ways: (a) clinician educators are included, (b) full-time faculty members who may work less than full time at a dental school are included, (c) guaranteed annual salaries are converted to a guaranteed annual salary per half day, and (d) the comparative data for the three professorial ranks exclude the salaries of Deans, Associate and Assistant Deans, various Directors, and Department Heads. In order to make meaningful comparisons using the salary norms generated by AADS survey, Penn's School of Dental Medicine provided the Committee with mean and median salaries computed in accordance with the survey system and principles for members of the Faculty of Dental Medicine separately for the areas of clinical science and basic science, provided the number of faculty members was four or more in a rank by area cell. Because Penn mean and median salaries were very similar, only the comparative levels of the median salaries are discussed below.

For the dental school, we report the results of two comparisons: (1) trends over time within the school (we have three years of data), and (2) comparisons to the 50 or so peer schools. It is important to note for both the within and cross-school comparisons that we are dealing with small sample sizes. For example, there are between 4-8 full professors and 4-6 assistant and associate professors. Therefore, any trend findings could literally be due to one or two individuals, and hence should be taken with great care.

Within the school, Penn's dental salaries have been relatively stable,

[8] For the 2000-2001 AADS salary survey, 54 institutions participated (18 in the private sector, 36 in the public sector). The private schools were: Boston U., Harvard, Tufts, Columbia, N.Y.U., Temple, Penn, Pitt, Howard, Meharry Medical College, Nova Southeastern Univ. , Marquette, U. Detroit Mercy, Creighton U., Case Western Reserve, U. Pacific, U.S.C., and Loma Linda U. The public schools were: U. Conn., U. Maryland, UMDNJ (New Jersey), SUNY at Stony Brook, SUNY at Buffalo, U. Alabama, Baylor College of Dentistry, Medical College of Georgia, U. Kentucky, U. Louisville, Louisiana State U., U. of Florida, U. of Mississippi, U. of N.C., U. Oklahoma, Medical University of South Carolina, U. Tennessee, U. Texas at HSC at Houston, U. Texas HSC at San Antonio, W.V.U., U. Puerto Rico, Virginia Commonwealth U./MCV, Southern Illinois U., U. Illinois, Indiana U., U. Iowa, U. Michigan, U. Minnesota, U. Missouri, Kansas City, Ohio State U., U.C.L.A., U.C.S.F., U. Colorado, U. Oregon, U. Washington.

except for the assistant professor level where there has been substantial growth (again this could be due to one or two persons). At the full professor level, there has been some decline in salaries but indeed the number of full professors has declined and this may be due to retirements or transfers.

Across school, Penn's dental salaries at both the clinical and basic science level appear to be quite competitive, being well above the 75th percentile for each reference group. We laud the administration for this, and hope that this trend continues. One caveat, of course, is that given the list of 54 schools, some of them do not appear to be direct competitors of Penn; nevertheless Penn's salaries appear to be at the upper range of the scale.

2. School of Nursing

With respect to the mean salary levels of faculty members at Penn's School of Nursing, comparative data are available from a salary survey for 2001-02 conducted by the American Association of Colleges of Nursing (AACN). Accordingly, Penn salaries can be compared to salary norms based on a sample of 10 nursing schools that have been selected as Penn's peers.[9] The salary norms available include the 25th, 50th, and 75th percentile salaries, along with the mean salary, of the sample of 10 comparison schools (excluding Penn).

The data recorded by the nursing salary survey differs from the standard definition of salary used in this report (i.e., the academic base salary of standing faculty members excluding clinician educators) in the following ways: (a) clinician educators are included (Penn included its clinician educators in nursing), (b) includes administrative stipends where they exist (Penn included administrative stipends paid to its nursing faculty), (c) and may include clinical income (but any clinical income earned by Penn faculty is excluded for the purposes of this salary study). In order to make meaningful comparisons using the salary norms generated by the AACN survey, Penn's School of Nursing provided the Committee with mean, median, and 25th and 75th percentile salaries computed in accordance with the survey system and principles for members of the Faculty of Nursing. However, unknown differences across nursing schools in whether components such as administrative stipends and clinical income are included in reported salary statistics may render exact comparisons problematic. We believe that this is an area of major concern, as it may make the school of Nursing data "look higher than it really is". We will make a recommendation for next year's report that the SCESF be provided both sets of data for nursing (nine month salaries, no stipends, and no clinical income) as well as what is currently reported so that we can track both sets of information. Because the mean and median salaries for Penn's peer universities were very similar (within 3% of each other), only the comparative levels of the median salaries are discussed below.

In particular, with respect to the sample of 10 peer nursing schools from the AACN salary survey, Penn salaries for full professors in nursing were highly competitive (e.g., the 25th percentile Penn salary was higher than the 50th percentile in the comparison group). The level of Penn salaries for associate professors were above those of the comparison group, however not significantly. A similar finding for Penn's assistant professors of nursing held as well.

Overall, faculty salary levels at Penn's School of Nursing are quite competitive with those offered by a group of peer nursing schools, with Penn being much more competitive at the level of full professor than at assistant professor or associate professor level. What is also of note, is that based on last year's report, Penn seems to be slightly less competitive (albeit still doing well). Our hope is that the administration will keep an eye on this looking towards the future. Furthermore, going forward, we need to make sure that Nursing school comparisons are "apples to apples" with external data. Without this, the external comparisons made will be quite misleading.

3. School of Veterinary Medicine

Since issuing its 1999-2000 Report (*Almanac Supplement, January 22, 2001*) that included a section on the external competitiveness of faculty salaries at Penn's School of Veterinary Medicine, the SCESF has received no additional comparative salary data to report for this School. We do have internal data for the school of Veterinary medicine, just no external data.

D. Comparisons with Peer Universities Using AAUP Survey Data

In the absence of salary data for five of Penn's 11 schools (other than Medicine), a comparison of the mean salaries of all *full* professors at Penn was made with those at a small select group of research universities based on data published annually by the American Association of University Professors (AAUP) in the March/April 2002 issue of *Academe*. To make meaningful and fair comparisons of Penn salaries with those at other Universities, five criteria for selection of comparison universities were first defined: (a) be included in the Research I category of the Carnegie Classification System, (b) offer a broad array of Ph.D. programs in arts and sciences disciplines, (c) include at least two of three major professional schools (law, business, engineering), (d) not include a school of agriculture, and (e) have a composite academic reputation rating greater than 4.0 (on a five point scale)[10] in a rating system reported by *U.S. News and Report*. The 17 research universities meeting all five of these criteria are identified in the first column of Table 5. In addition, as Princeton and NYU are considered by this SCESF as main competitors of Penn for faculty, we have included these two schools as well.

The relative standings of mean salaries of Penn full professors are presented in Table 5 for six years. The order of listing of universities in Table 5 was determined by the magnitude of mean salaries of full professors (from high to low) for the most recent academic year (2001-02). Next, the difference between a comparison university's mean salary and Penn's mean salary was computed as a percentage of Penn's mean salary. For example as seen in Table 5, the mean salary of Harvard full professors in 1986-87 was 16.9% higher than Penn's mean salary that year ($59,600), while the mean salary at Northwestern was 4.9% below Penn's mean salary.

The data of Table 5 show that the mean salaries for full professors at Penn gradually became more competitive during the past 15-year period. For example, seven universities provided mean salaries more that 2% higher than Penn in 1986-87, while the mean salaries at only four universities (Harvard, Yale, Princeton, and Stanford) exceed Penn by more than 2% in 2001-02. In addition, the percentage advantage of salaries at Harvard, Stanford, and Yale over Penn decreased substantially during this period of time, while only Chicago gained in percentage advantage, although it declined in the last year 2001-02. In addition, if we look at all the schools below Penn as of 01-02, each has fallen further behind Penn. This implies, overall, a good degree of competitiveness on Penn's part.

Based on the data of Table 5, it is clear that mean salaries of full professors at Penn, on the whole, become much more competitive with the very highest salaries elsewhere during the period 1986-87 through 1996-97, and during the past three years have mostly maintained their respectable competitive position among the top few universities in the nation. Though Penn's competitive position in this respect is strong in general, aggregated salary data such as these do not reveal which schools, and departments within schools, may provide mean salaries that are particularly competitive or that may lag behind their competition. Therefore, SCESF continues to seek comparative salary data that is specific to each of Penn's schools.

Even though SCESF was careful to select universities for overall mean salary comparisons that were similar to Penn on several important criteria and made comparisons at the full professor rank (i.e., we did not aggregate across the three professorial ranks), AAUP salary data did not permit the SCESF to control for the specific schools sponsored by each university and the number of full professors appointed to each school. Such controls are desirable because mean salary levels vary by school, as do the number of professors appointed to the faculty of each school on which the means are based. Therefore, the relative standing of Penn mean salaries in Table 5 might be misleading, but the trend over time showing an improvement in Penn's relative standing is judged to be sufficiently valid to include in this report. In addition, tables similar to that of Table 5 (for full professors) were constructed for associate and assistant professors. Due to smaller sample sizes and other factors clouding meaningful comparisons with other universities, no comparative salary data from AAUP surveys are presented for the two junior ranks.

[9] Peer universities in nursing included in the AACN sample are: Oregon Health Sciences U., Johns Hopkins U., U. California-San Francisco, U. Colorado Health Sciences Center, U. Illinois-Chicago, U. Maryland, U. Michigan, U. North Carolina-Chapel Hill, U. Pittsburgh, U. Washington.

[10] A composite rating was constructed by computing the mean of three separate academic reputation ratings: a general rating, a mean rating of key Ph.D. programs, and a mean rating of key professional schools.

IV. Penn Faculty Benefits

Although our 1998-99 Annual Report included a section on comparative faculty benefits data, further study of data available on cross-university comparisons of faculty benefits has revealed that comparative benefits data are of insufficient precision to make detailed quantitative comparisons meaningful. Accordingly, no such comparisons are made in this report.

Based on available comparative benefits data, however, it appears to SCESF that employee benefits package provided for Penn faculty members is of equal, or greater, value to that provided to faculty members at Penn's peer private universities. In particular, it appears that the tuition benefit for Penn faculty dependents is substantially greater than that provided by peer universities, while other major types of benefits are generally comparable. However, we believe that since it has been roughly 3 years since this has been looked at carefully, we request that this be included as part of next year's report.

V. Penn Faculty Salaries: Internal Comparisons

As previous reports of the SCESF have highlighted, there is a great deal of variability (e.g., inequality) in faculty salaries at Penn attributable to several recognized factors: differences in individual merit, rank, time in rank, external labor market forces, the relative wealth of Schools, and perhaps differences among Schools in principles and practices for allocating salary increments.

One of SCESF's concerns has been that, among all the existing variability in faculty salaries, there might be some significant element of inequity (i.e., salary setting based on incomplete or inaccurate information about merit, or bias that could be involved in the process of deciding salary increments). However, it is not possible for the SCESF to pinpoint any instance of individual, or group, inequity without individual faculty salaries and associated information about individual merit, labor market forces, etc. What we can do is review many facets of salary variability and raise questions about the possibility that inequity might be responsible for some degree of the observed variability. These questions might lead to further review and action by senior academic administrators (Department Chairs, Deans, and the Provost) with a view to correcting any inequities that might be identified.

We turn next to a description and analysis of several dimensions of faculty salary variability within Penn. As with the external salary comparisons reviewed above, all salary data reviewed in this section exclude the School of Medicine and all standing faculty members who are appointed as Clinician Educators from four other schools that have such positions (Dental Medicine, Veterinary Medicine, Nursing, and Social Work).

A. Variability in Average Salary Increases by Rank and School/Area

As reported in Table 1, median faculty salary increases by rank (for all of Penn's schools combined) substantially exceeded the growth in the CPI for most recent full year (FY 2001) for which both sets of data are available and exceeded Penn's budget guidelines for the current year and past three years (FY 2000, 2001, and 2002). These salary increases are broken out by school and rank in Tables 6, 7, and 8 where it can be seen that there has been considerably variability in median salary increases across schools and years, as well as among the first and third quartile increases (Q_1 and Q_3, respectively). With respect to full professors (see Table 6), 7 of 13 of the median salary increases for FY 2001 approximated the general guideline of 3.5% (within 3-4%), while the other 6 were well above it.

Before reviewing these salary increases, it should be recognized that the salary increase guideline of 3.5% is just that, a guideline, and pertains to an aggregate of all increases for all ranks combined for each of Penn's schools (i.e., merit increases for continuing faculty members, special increases for faculty members who have been promoted in rank, and market adjustments for faculty members with generous salary offers from other institutions). Schools may allocate more, or less, resources to faculty salary increases than the guideline, depending upon each school's financial circumstances (see Section II.B. above). Therefore, a comparison of the median increase awarded to faculty members of a particular rank and school with the salary guideline only gives an indication of the extent to which the guideline was implemented in that particular instance. Accordingly, a particular median increment of less than 3.5% should not be regarded as a specific failure of salary policy, since there is no policy for each rank and each school to be awarded at least that much on average. Furthermore, the 3.5% guideline pertains to the mean increase, a measure of central tendency that is usually higher than the median salary increases as shown in Table 1. This is a statistical fact that indicates positive skewness in the distribution of salary increase percentages within schools/areas (i.e., the majority of salary increases are bunched toward the low end, with a small or modest percentage of faculty members benefiting from relatively large increases).

Nonetheless, the overall mean salary increase for all faculty members continuing in the same rank for FY 2002 was 6.7% (see Table 1), a number well above the guideline of 3.5%. Even so, this substantial salary increase resource in the aggregate was not distributed sufficiently widely to lift the median salaries of all ranks in all schools/areas by at least the guideline amount—a phenomenon that can be attributed to differing wealth and budget priorities among the various schools as permitted under RCBS.

The SCESF has been advised that the change in policy for 1998-99 (i.e., specifying 1% instead of 2% as the minimum of the standard range of salary increases) was taken because Deans wished to have greater flexibility in awarding such increases. Although SCESF has not raised an issue specifically about this policy, we have regularly raised the more general issue about principles by which salary increases are awarded in relation to increases in the CPI (the UScityaverage from Table 1). We note that for the Professor rank, 10 of the 14 schools have a 25th percentile 2001-02 raise above or near CPI. At the associate professor level, this holds for 9 of the 13 schools who reported, and for 10 out of the 13 schools for Assistant professors. This demonstrates fairly reasonable equity across rank, in regard to the 25th percentile, across school. It is also consistent with Table 2 in which we see that many schools have approximately 20-25% of its faculty receiving raises at or below CPI.

The distribution of salary increase resources is shown clearly in a comparison of the first and third quartile data of Tables 6, 7, and 8 for FY 2002.

Some notable findings from these tables include:

Full Professors:

(1) The low first quartile (2.5%) in Annenberg, leading to its high figure (75%) overall below CPI.

(2) The low first quartile in GSFA (2.5%),

(3) The high first quartile for Wharton (5.4%), the Law school (4.5%), and the school of Social Work (4.3%). All other first quartiles are within a comparable range (3-4%).

(4) With regards to the 75th percentile, some noticeable points are Annenberg's low value of 3.1% indicating a very tight pool of salary range increases, and the school of social work (11.0%) and Wharton (10.1%) which had high values.

Associate Professors:

(5) The only noticeable low 25th percentile is that of the school of nursing (2.8%), contributing to its low 62% above CPI figure overall (Table 2).

(6) There are many schools which have very high 75th percentiles (above 10%) – GSFA, Humanities, Medicine (Basic Science), Natural Science, Nursing, and Wharton.

Assistant Professors:

(7) Only the nursing school (2.5%) and school of social work (3.0%) had first quartiles below CPI, and many others had significantly higher first quartiles (GFSA, 5.0%).

(8) In terms of the third quartile, dental medicine, GFSA, and Medicine-Basic were above 10%, whereas the school of social work (4%) and Wharton (5.1%) had low figures.

In summary, the distribution data in Tables 6, 7 , and 8 appears consistent with the overall CPI figures. That is, faculty in Annenberg and Nursing, in particular, had considerable low first quartiles (leading to a substantial fraction of persons below CPI). In addition, as seen in Tables 6, 7, and 8, there is considerable variability for all three years in salary increment percentages both among Schools within ranks, and among ranks within Schools. SCESF is not aware of specific information about merit and market factors that is available to department heads and deans, and how they weigh this information in deciding salary increments for individual faculty members. Without such information, it is not possible to determine whether any inequity is involved in the salary increase percentages reported in these tables.

One other request, which arose out of the SCESF meeting to discuss this report, is that in Tables 6,7, and 8 we do not report quartiles for schools by rank where the sample size is 10 or less (as quartiles would be based on two people). While we agree wholeheartedly with this, we would still like to see a measure of dispersion for these schools by rank. Accordingly, we

recommend (and see at the end of the report) that in future years, the committee is provided a two or three year average, of those quartiles, for those schools in which we normally would not be able to report a 1st or 3rd quartile.

B. Variability in Average Salary Levels by Rank

Three-year trends in mean faculty salaries by rank are shown in Table 9 for all schools combined, except Medicine, of course.[11] Such data give the crudest perspective on rank differences in salary, however, because of aggregation biases across schools. For example, one might expect a considerably larger difference between mean assistant and associate professor salaries. The modest difference might be accounted for by the facts that the Law School has no associate professors (a fact that might decrease the observed associate professor mean) and the Wharton School has a considerably higher percentage of assistant professors than is typical of other schools (a fact that could increase the observed assistant professor mean).

A more meaningful comparison of variation in faculty salaries by rank is made by computing the ratios for continuing faculty members for each school and then computing a mean weighted ratio (weighted for the number of continuing faculty members at each rank in each school.)[12] The weighted ratios thus computed are also seen in Table 9. Viewed in this way, there is much greater spread in mean salary levels by rank with those of full professors being 78% and associate professors approximately 23% higher than assistant professors.

As discussed in the prior section, percentage salary increases for assistant professor, in the aggregate, have been considerably greater than for full professors during the past three years (1999-00, 2000-01, and 2001-02). This trend can also be seen in Table 9 where the weighted ratio of professor to assistant professor salaries has declined year-by-year since 1998-99 (and even more since 1987-88 when the ratio was 1.89), although this year's figure of 1.78 is basically equivalent to last year's and may indicate some leveling off. Thus, full professor salaries are losing the internal "competition" for salary increase resources within Penn, as well as losing ground over the same period of time in the external competition with other universities in the MIT salary survey sample as reviewed above.

C. Variability in Professorial Salary Levels by Years of Service

There has been some concern that full professors who have recently been recruited to Penn (perhaps including those who have recently been promoted to the rank of full professor) have had their salary levels set considerably higher than professors of equivalent merit who have served at Penn for many years (and without commensurate increases to the levels set for recent appointees). If this phenomenon occurs within a department, it would seem to constitute an inequity in salary policy. Consequently, the SCESF has recently requested and obtained new and improved salary data to study this matter.

Comparisons were first made by school/area between the current mean salaries of (a) full professors who were appointed, or promoted, as full professors longer than eleven years ago (i.e., prior to July 1, 1990) and (b) those who were appointed as full professor from outside Penn during the past 11 years (i.e., excluding those who were promoted to full professor from within Penn during the past 11 years, a separate category addressed below). For this analysis, a minimum of four professors per group was required to compute a mean salary. By this principle, sufficient data were available to make this comparison for 9 of the 14 standard schools/areas routinely analyzed for this report.

It was found that the mean salaries of recently-appointed full professors exceeded the mean salaries of those appointed longer than 10 years ago in seven of the nine schools/areas available for analysis, whereas the opposite occurred in only two of the nine schools/areas, and those differences were literally inconsequential (about 1.5% of the salary). Furthermore, in the seven schools/areas in which the recently appointed professors receive the higher mean salaries, the mean percentage salary advantage is 16.5% over professors appointed more than 11 years ago. Thus, there clearly seems to be a general trend to pay considerably higher mean salaries to full professors appointed at this rank to Penn during the past 10 years than prior to this. For purposes of brevity, hypotheses regarding why this may occur are listed in last year's SCESF report and are not repeated here.

A parallel analysis was made by school/area between the current mean salaries of (a) full professors who were appointed, or promoted, as full professors longer than ten years ago (i.e., prior to July 1, 1990) and (b) those who were promoted to full professor from within Penn during the past 11 years. For this analysis, a minimum of four professors per group also was required to compute a mean salary. By this principle, sufficient data were available to make this comparison for a somewhat different group of nine of the 14 standard schools/areas routinely analyzed for this report.

The results were quite different than observed for full professors appointed from outside Penn within the past 10 years. It was found that the mean salaries of associate professors recently appointed to full professors from within Penn exceeded the mean salaries of those appointed as full professors longer than 11 years ago in only four of the nine schools/areas available for analysis, whereas the opposite occurred in five of the nine schools/areas. Furthermore, in the four schools/areas in which the recently promoted professors receive the higher mean salaries, the mean percentage salary advantage ranges from only 1-4% over professors appointed more than 10 years ago. In the other five schools in which formerly appointed professors have higher mean salaries than those promoted during the past 11 years, the mean salary percentage advantage was substantial in all instances. Thus, there clearly seems to be a general trend to pay considerably higher mean salaries to full professors appointed at this rank more than ten years ago in comparison with those promoted to professor from within Penn during the past 11 years.

D. Variability of Average Salary Levels by School/Area

As described in previous SCESF reports, there is considerable variability in median faculty salary levels across Penn's 14 schools/areas (as listed in Table 3). Information about the extent of this cross-school variability is presented by rank in Table 10 for the three most recent academic years in terms of the first quartile (Q_1), second quartile (Q_2, the same as the median), and the third quartile (Q_3) of median faculty salary levels. For full professors, the interquartile range of median salaries in 2001-02 based on the 14 schools/areas was $34,658 (i.e., the third quartile salary of $135,158 minus the first quartile salary of $101,500). The comparable interquartile range of salary levels across schools/areas was understandably less for associate professors ($26,825) and assistant professors ($24,255) in absolute dollars. Three facets of these data will be considered below: 1. Measures of salary variability, 2. Differences in variability across ranks, and 3. Trends in variability over time.

1. Measures of Variability

The measure of variability of median salaries across schools/areas of continuing faculty members selected here is the interquartile range (IQR) (i.e., the third quartile salary in the distribution minus the first quartile, all as described in more detail in footnote "c" of Table 10). However, the IQR can be expected to be larger when the general salary level is relatively high (such as for full professors) than it is when the general salary level is much lower (such as for assistant professors). To compensate for such differences in the general level of salaries, we have divided the IQR by the median of the distribution (i.e., the second quartile: Q_2), thereby computing a ratio of the IQR to the median (as reported in the next to last column of Table 10 labeled "Ratio: IQR to Median").[13] This ratio provides an index of the amount of variability in relation to the general level of the salary distributions, and has utility when comparing variabilities across ranks and trends over time.

2. Differences in Variability Across Ranks

As seen in Table 10, while the variability (i.e.,the IQR) of median salaries for Penn's 14 school/areas for the three professorial ranks is similar for full and associate professors, and not much different for assistant professors, the ratio of the IQR to the median is increasing from full to associate to assistant professors. Why this should be, and its implications for salary

[11] The mean salary figures for full professors recorded in Table 9 for 1999-00 are higher than those recorded in Table 5 which are drawn from AAUP reports. This discrepancy is a product of two AAUP policies: first, to exclude faculty members with decanal titles (which will reduce the AAUP mean); second, to include all faculty members in a rank (including those newly appointed to a rank) whereas Table 9 data are limited to faculty members who continued in the same rank from the prior year (a difference that will also reduce the AAUP mean).

[12] Weighted ratios were based on all Schools except Annenberg which has only one assistant professor. Law was not included in the associate professor ratio since none of its faculty members are appointed at this rank.

[13] The statistically inclined reader will recognize this ratio as similar to the coefficient of variations (i.e., the ratio of the standard deviation to the mean of a distribution).

policy, are not clear. It might be a function (at least in part) of the much great variability in external competitiveness among assistant professor salaries across schools/areas at Penn, than among salaries of full professors, as observed in the MIT survey (see Table 4). As we state at the end of this report, this may be indicative that Penn, overall, is not matching the highest end salaries of its competitors as indicated by the lower variability to median salary ratio of full professors as compared to the other ranks. In the future, we would like to see this tracked over time.

3. Trends in Variability Over Time

Also as seen in Table 10, the variability (i.e.,the IQR) of median salaries for Penn's 13 school/areas for the three professorial ranks in 2000-01 increased considerably from two years prior (1999-00). This is evidence of rapidly increasing disparity of faculty salaries across Penn's 14 schools/areas. However, for full professors and to a lesser extent for associate professors, the ratio of the IQR to the median has become larger during the three most recent years, thereby indicating that schools/areas offering higher median salaries also offer higher annual percentage increases. That is, the increases in the IQR are not just proportional to the increase in salary levels from one year to the next, but the disparities among schools/areas in median salaries is growing in percentage terms as well as in dollars. However, this type of increasing variability among median salaries across schools/areas is not seen for assistant professors in Table 10.

The modest trend toward greater disparity across schools in median salary levels of continuing full and associate, as seen in Table 10, has occurred because, as a general principle, schools/areas offering higher average salaries also offer higher annual percentage increases. This phenomenon is demonstrated by a slight correlation between the mean percentage salary *increase* for full professors in one year with the mean salary *level* in the same year across Penn's 13 schools/areas. In FY 2002, this correlation coefficient (r) across the 13 schools/areas was .17; in FY 2001, it was .25. Moreover, this correlation of the amount of salary increase with mean salary levels is a more general trend. The median percentage salary increase of full professors from FY 1993 though FY 1999 was correlated highly (i.e., r = .62) with the median salary in FY 1999 across the 13 schools/areas. Thus, the escalation of average salary differences across schools/areas is a gradual multi-year trend that has continued into the current year.

In short, these statistical facts indicate that, in general, differences in median faculty salaries between lower paying schools/areas and higher paying schools/areas have been, and continue to be, slowly increasing both in dollar amount and in percentage difference. As noted in prior SCESF reports, variability among schools/areas is no doubt a product, to a considerable extent, of market forces in the hiring of faculty members and in the relative wealth of schools (i.e., financial ability to support faculty salaries). The relative wealth of schools available for supporting faculty salaries is, in major part, a function of how much income a school is able to earn and the level of non-faculty expenditures it regards as essential—all as discussed above in the section on RCBS in SCESF's report from last year (2001).

If the wide difference among schools/areas in median salaries of full professors seen at Penn is a general phenomenon at other universities as well, there will be evidence that Penn is experiencing a general market phenomenon instead of a local idiosyncracy. To test this possibility, we analyzed recent data from the MIT Salary Survey for 12 universities[14] which reported salary means for full professors for all five academic areas (architecture, engineering, natural sciences, social sciences/humanities, and management). For each of these 12 universities, we computed the ratio of the mean salary of the highest paying area to the mean salary of the lowest paying area. The result was that these 12 ratios ranged from a low of 1.32 to a high of 2.05, with a mean of 1.59—indicating that wide variation in mean faculty salaries across academic areas is common and substantial. Penn's ratio in the MIT data was virtually the same as the mean of the 12 universities. This suggests that the variability in mean faculty salaries across schools/areas at Penn is currently in line with experience elsewhere, and is a function of general economic forces affecting all of academia.

[14] The sample of 12 universities analyzed was selected from the following group of 13: Carnegie Mellon University, Columbia University, Cornell University, Georgia Institute of Technology, Massachusetts Institute of Technology, Rice University, University of California (Berkeley), University of California (Los Angeles), University of Illinois, University of Michigan, University of Pennsylvania, University of Texas, and Yale University.

VI. Conclusions

A. Economic Status of the Faculty

1. External Competitiveness. In general, faculty salaries at Penn continue to be at a minimal competitive level with a small select group of universities that provide the highest levels of faculty compensation in the nation. Evidence for this conclusion comes from the following sources:

• The results of the annual MIT salary survey of 25 major research universities (about half private, half public) place the weighted mean salaries of Penn full, associate, and assistant professors (from SAS, SEAS, GSFA, and Wharton, combined) at or slightly above the mean of their respective academic fields as of Fall 2001.

• The results of annual surveys of faculty salaries in dental medicine and veterinary medicine suggest that the mean salary levels in Penn's School of Veterinary Medicine and School of Dental Medicine are in the upper echelons of their respective fields.

• The results of the annual AAUP salary survey for a group of 19 peer research universities place the mean salary of Penn full professors in rank order five as of academic year 2000-01. The highest mean salary in this group (at Harvard University) is 13% higher than the Penn mean (Table 5).

2. Internal Variability. There is great variability in the distribution of faculty salary resources among the three professorial ranks (see Table 9), among the fourteen schools/areas included in this report (see Table 10), and among individual faculty members by rank within schools (see Tables 6, 7, and 8). Furthermore, a considerable portion of the variability in average faculty salaries across Penn's schools/areas is the product of market forces as suggested by the results of a comparison of school mean differences at Penn with differences at peer universities. That is, considerable variability in average faculty salaries among these schools/areas is required to maintain competitive standings within different academic fields.

B. Conditions of Concern

1. External Competitiveness. Although Penn faculty salaries are *generally* competitive with those provided by a select group of universities (as noted above), the following *particular* conditions are of concern about the external competitiveness of faculty salaries at Penn:

• As indicated in SCESF's 1999 Annual Report (see Section VI, Recommendation A.2), Penn is committed to bringing faculty salaries back to a competitive level "if faculty salaries in certain fields begin to fall behind." For academic fields for which specific competitive data are available from the MIT salary survey, it appears that Penn, at least in practice, has established in recent years a competitive level in the 65-70th percentile range. If so, mean faculty salaries for FY 2001-02 at the full professor rank in engineering, and assistant professor rank in architecture (which has not improved over the past 5 years), and engineering (which is improving) have clearly fallen behind. Accordingly, there is concern in these areas. All other schools/areas and ranks are at least at the median of the competitive salary range, although some are by no means at the 65th-70th percentile of that range. In general, we find that Penn is in "maintenance mode" in most cases, with respect to the schools in the MIT survey, and this trend has continued since 1996-97.

• SCESF continues to be concerned about the unavailability of data to make a judgment about the competitive level of average faculty salaries in each of the Penn's four schools (Communications, Education, Law, Social Work) that are not included in the MIT salary survey or in surveys for dental medicine, nursing, and veterinary medicine. As noted below (see Section VII. Recommendation 4), the Provost will continue to attempt to secure comparative salary data for the now four schools in question. Although, we are quite pleased that we have some comparison data for the nursing school, we would prefer to the extent possible that it was from a more directly comparable list.

2. Internal Equity. In the absence of data on individual faculty merit to compare with data on individual faculty salaries, SCESF is not able to identify any specific instance of inequity among all the dimensions of salary variability included in this report. However, there is concern that some of the wide variability in individual faculty salaries may entail more than a trivial element of inequity. Though we are not able to report specific instances of salary inequity among individual faculty members, ranks, departments, or schools, SCESF has identified the following conditions that give rise to equity concerns:

• In spite of moderate inflation in FY 2000 (CPI growth in Philadelphia of 3.2%) and substantial resources available for faculty salary increases for

FY 2001 (6.7% in the aggregate across schools/areas and ranks), 18% of Penn's standing faculty members received salary increases for FY 2002 that were less than the CPI growth percentage—an effective reduction in salary. This is quite disturbing given that this is virtually double the previous years. In addition, over 20% of faculty members in ten schools/areas received increases less than the CPI growth percentage (see Table 2). Two main alternative explanations for these percentages are: that over 20% of the faculty in these schools/areas performed at an unsatisfactory level, or that some of these effective salary reductions may have been inequitable.

• In spite of modest inflation since FY 1996 and substantial resources for faculty salary increases, only 80% of full professors in the natural sciences area of SAS, 83% of full professors in the social sciences area of SAS, 82% in the GSFA, 72% in the Medical School, 83% of Law faculty, and 86% in the School of Engineering and Applied Sciences received cumulative salary increases during the period 1996-2002 that exceeded the growth in the Philadelphia CPI (see Table 3). Fortunately, considerably higher percentages of full professors in other schools/areas received cumulative salary increases that exceeding CPI growth during this six year period. Therefore, it seems possible that some of the effective salary reductions experienced by full professors in the natural and social sciences and in engineering were inequitable.

VII. Status of Committee Recommendations Submitted in 2000-01 and New Recommendations

In accordance with Faculty Senate policy, a report is presented below of progress made, and current status of, recommendations made in FY 2000-01 for development of faculty compensation policy and procedures. These recommendations are presented below along with the responses of Provost Barchi (to whom the recommendations were made in early 2002), SCESF's comments, and subsequent developments. In addition, we include a set of new issues to discuss.

A. FY 2001-2002 Faculty Salary Policy and Procedure Issues for Provost Response

1. Salary Competitiveness Issue.

The need to attain and maintain faculty salary levels that are highly competitive with salaries provided by peer universities, while simultaneously sustaining other components of university operations essential to providing high quality instruction, research, and service.

SCESF Recommendations:

a. Apparently, mean faculty salaries in several academic fields included in the MIT Salary Survey have fallen behind the level at which Penn ordinarily competes. If these four faculty groups are as meritorious, on the whole, as comparable faculty groups at Penn with more competitive mean salary levels, it is recommended that priority be placed on increasing mean salaries to Penn's competitive level of the groups that have fallen behind. These areas are:

(1) Full professors in:

(a) Engineering

Provost Response:

We will examine this situation and recommend changes if they are warranted. In particular, if there are exceptionally productive faculty members whose salaries are lagging those salaries should be brought up. On the other hand, we do not feel that resources should be invested simply to increase mean salary levels without individual justification.

SCESF Response:

We thank and agree with the Provost that this is not a blanket request to increase all full professors salaries in Engineering; yet, a point to make sure is communicated with appropriate administration at the school of Engineering.

(2) Assistant professors in:

[a] Natural Sciences

[b] Engineering

[c] Architecture

Provost Response:

We concur with this area of focus. In general salaries of assistant professors should reflect the need to attract and keep the very best young faculty members. If we are losing out in either of these respects we will improve our offers and counter-offers in these areas.

SCESF Response:

Although likely beyond the role of the SCESF, this suggests (if not already done) tracking of offers made to assistant professors and their acceptance rate, to provide a benchmark as to our competitive position.

b. Even though priority should be placed on regaining Penn's competitive level in the academic fields identified above, it is recommended that equal priority be given to recognizing in advance and rewarding with salary increases distinguished performance of faculty members who choose not to seek, or use, attractive offers of external appointment to negotiate salary increases.

Provost Response:

We strongly agree with this recommendation and have discussed this on numerous occasions with the deans. We hope that deans and department chairs are already sensitive to this issue. We will stress the need for attention to it when we transmit salary information.

SCESF Response:

We appreciate the Provost's sincerity on what we feel is a crucial matter.

2. Salary Equity Issue. The need to identify and eliminate inequity among individual faculty salaries by rank within departments (and schools organized as single departments).

SCESF Comment:

As reviewed in this SCESF's *Annual Report* for 2001-02, a considerable percentage of faculty members (18%) received salary increases for FY 2001 that were below the growth in the CPI (Phil.) for the 12 months ending June 2001. Moreover, this percentage was higher than in the prior year (9%). Consistent with this higher percentage was a general decline across schools in the first quartile salary increase for full and associate professors. It thus appears likely that some faculty members who have performed at least at a satisfactory level have received salary increases less than growth in the CPI. If so, this represents an effective reduction in salary in terms of purchasing power—a circumstance that is clearly inequitable given that the overall salary increase percentage for each school was well in excess of the growth in the CPI.

SCESF Recommendations:

a. In view of the quantitative facts identified above, it is recommended that further consideration be given by the Provost and the Deans to eliminating, or decreasing in frequency, the assumed inequitable practice of awarding salary increases below the annual growth in the CPI (Phil.) to faculty members who have performed at least at a satisfactory level. In making this recommendation, we realize that the feasibility of awarding increases to faculty members with satisfactory performance at least as great as growth in the CPI depends on the difference between funds available for salary increases and the CPI growth percentage—with the larger the positive difference, the greater the feasibility of providing salary increases of at least the CPI growth percentage.

Provost Response:

It is certainly reasonable, in principle, to try to provide salary increases at least at the level of the increase in the CPI to faculty members who perform at a level that is at least satisfactory. However, the need to provide rewards to the most productive faculty members, as requested by this committee (see above), to improve starting salaries, and to address inequities which develop over time, coupled with limitations on overall University, school, or departmental resources, can make the achievement of this goal difficult in some years. In fact, average salary increases for Penn faculty over the past decade have run well above the annual increase in CPI.

SCESF Response:

We wholeheartedly agree with the Provost that Penn's average salary increases have led CPI dramatically over the past decade (Table 1), and that the ability to manage micro-level year to year increases versus CPI is difficult and agreeably questionable as a goal.

b. Therefore it is further recommended that, for each faculty member who has performed at least at a satisfactory level during the prior year but who is awarded a salary increase that is less than the most recent data available about the annual percentage growth in the Philadelphia CPI (e.g., from January through December of the prior year), the faculty member should be provided by the relevant academic administrator with the following in-

formation:

- that his/her performance has been at least satisfactory, and
- the circumstances that caused the percentage increase below the CPI growth percentage.

Provost Response:

The salary letter that faculty members receive should include an explicit assessment of their recent work. That letter should also indicate why the salary level has been set in a particular way.

SCESF Response:

We agree. Our question is how many of Penn's faculty actually receive such an explicit assessment? If the SCESF committee members are representative of such a fraction, the answer is not high. We therefore request that the Provost continue to request that such feedback be provided.

SCESF Comment:

The Committee hopes that this recommendation will be implemented for salary increases decided during the Spring Term 2003, and that, as may be appropriate, this information will be provided to individual faculty members about their performance at the time each is notified of their annual salary increase.

3. One further request, which arose out of the SCESF meeting to discuss this report, is that in Tables 6, 7, and 8 we do not report quartiles for schools by rank where the sample size is 10 or less (as quartiles would be based on two people). While we agree wholeheartedly with this, we would still like to see a measure of dispersion for these schools by rank. Accordingly, we recommend that in future years, the committee is provided a two or three year average for those schools in which we normally would not be able to report a 1st or 3rd quartile.

Provost Response:

We will do this in cases where it is feasible.

SCESF Response:

Good, and in future reports we will make sure to denote those quartiles that are based on some combination of current and historical data.

4. This committee would like to laud the School of Medicine, basic sciences, for agreeing to participate in this year's report for the first time. We would like this trend to continue, and request that the provost do everything possible to insure this. In addition, we want to make sure that no "conditions" are required for this request; that is, the school of medicine is asked to comply to provide salary data as are all other schools.

Provost Response:

We will do this.

SCESF Response:

Thank you. Also, as we state on page V, we hope that the School of Medicine, basic sciences, will also start providing the SCESF external comparison data that we believe exists. This will allow us the opportunity to provide them the same oversight we provide to our schools and departments.

5. One recommendation that came out of this committee, was the possibility of having a shorter version of this report (say 10 pages or so) for general consumption, and a more detailed version (like this report) that is provided on-line for the persons wanting details. We believe that this would lead to a wider dissemination of this information to the faculty at large, and we hope that the provost would work with next year's committee to determine what might appear in this so-called "executive summary SCESF report."

Provost Response:

We agree that this would be useful.

SCESF Response:

Good. The 2002-2003 SCESF report will likely contain a shorter version to be published in *Almanac* with a longer version available online. We hope that this will increase *Almanac* readership and get all faculty involved in SCESF issues.

6. One further request that came out of the SCESF meeting, was the possibility of having the provost meet with the SCESF prior to setting salary guidelines for the next fiscal year. As we understand such decisions usually take place in mid-late Spring semester. We would hope that such a meeting could take place early in the Spring semester. Our belief is that this would add to the comfort level that the SCESF had about the decisions that were made regarding salary setting policy.

Provost Response:

We are willing to meet with SCESF in the spring.

SCESF Response:

We look forward to that meeting.

7. We make a recommendation for next year's report that the SCESF report both sets of data for Nursing (nine month salaries, no stipends, and no clinical income) as well as what is currently reported so that we can track both sets of information. We request that the Provost assist us in collecting this data from the nursing school going forward.

Provost Response:

Tracking both sets of data for the School of Nursing would have little value.

SCESF Response:

We recognize the Provost's concern that looking only at nine month salaries could lead to micro-managing of one's total compensation and hence may have a negative impact.

8. As it has been over three years, it was the 1998-99 report, in which faculty benefits were looked at in comparison to our peer institutions, we request that the Provost's office provide this information to the SCESF for year 2002-2003 in accordance with what was done in 1998-99. Furthermore, going forward, we believe that this should be looked at roughly every five years if not more frequently.

Provost Response:

We agree that this is a timely request. We will work with the committee to carry out such a study.

SCESF Response:

Good. We hope this can be one of the points of discussion for our spring meeting.

9. One of the concerns of the SCESF is the low relative spread in salaries at the full professor level which may indicate a problem in attracting faculty at the upper end of the scale. This is evidenced in Table 10, in which the spread in full professor salaries as a ratio to median salary is lower than that for assistant and associate professor. We would like to request that the Provost continue monitoring this situation and advice the committee as to what efforts are being made to allow Penn's "top end" to stay competitive.

Provost Response:

In general, we fully agree that salaries should be determined by performance and not only by time in rank. We, too, would expect that this would lead to a broad but acceptable spread in full professors' salaries. We will examine this issue. However, it is not obvious that the spread in salaries has provided any serious obstacle to offering competitive salaries to excellent external candidates for positions at the full professor rank, or to responding to competitive offers in senior retention cases.

SCESF Response:

We thank the Provost for stating that this is a matter he will look into.

10. Issue Concerning Data on the Competitiveness of Faculty Salaries not Included in the MIT Survey. The need to seek, or compile, evidence about the competitiveness of faculty salaries at schools not included in the MIT survey.

SCESF Recommendations:

In accordance with the agreement with the Provost in 1999 and 2000, it is recommended that the Provost continue his efforts to secure data on the competitiveness of faculty salaries in Penn's schools not included in the MIT Salary Survey or the surveys for veterinary medicine and dental medicine.

Provost Response:

We will try to obtain such data.

SCESF Response:

We appreciate it as it will allow us to make a more meaningful set of comparisons.

B. Final Summary

While the Penn faculty have remained equally competitive in most areas, and have gained in some (and thankfully lost ground in few), the salary increases with respect to CPI is the great message from this report. We are concerned about the large number of Penn faculty who received raises below the CPI in the 2001-2002 year, and furthermore have 5 year average raises below CPI. We believe that an explicit policy needs to be developed such that:

(a) when the faculty midpoint salary raise guideline is given (e.g. 3.5%) to the schools, its level will be set in accordance with actual or projected CPI,
(b) faculty members who receive raises below the CPI, or have raises below the 5 year compounded CPI are informed as such,
(c) Department chairs/Deans should be provided information regarding faculty members who have received raises below CPI in the past,
(d) We recommend that department chairs/deans be provided information as to the raise that would be required to bring each faculty member's salary to at least the minimum CPI growth at the time they are setting salaries.

Provost Response:

Department chairs and others who set faculty salaries should have direct access to information on faculty salary history and salary tracking relative to the CPI. This information should be taken into consideration, along with a variety of factors such as individual performance and school and University financial position, in determining salaries for the coming year. The salary letter that a faculty member receives should certainly include an explicit assessment of their recent work and indicate why the salary level has been set in a particular way. However, a selective focus on maintaining minimum salary increases at the level of the CPI, given the constraints of the overall resources often available for salary increases, has a collateral negative impact on resources required to keep the best faculty from looking elsewhere, to recruit the best new faculty, or to reduce the salary inequities that develop as faculty members' productivity changes.

SCESF Response:

We agree that the overall impact of targeting all salaries towards CPI could have a collateral negative impact. Our hope is that this information is provided to Department Chairs and Deans so that CPI, as well as other criterion, can be used as guiding tools (not rigid constraints) to their decision making.

We hope the provost and the administration considers these recommendations.

VIII. Members of the 2001-2002 Senate Committee on the Economic Status of the Faculty

Eric T. Bradlow, Associate Professor of Marketing and Statistics, Committee Chair
Terms Expire April 2002
Andrew Postlewaite, Professor of Economics
Lorraine Tulman, Associate Professor of Nursing
Terms Expire April 2003
Howard Goldfine, Professor of Microbiol/Med.
Janice F. Madden, Professor of Sociology
Terms Expire April 2004
Eric T. Bradlow, Associate Professor of Marketing and Statistics
Richard E. Kihlstrom, Miller-Freedman Professor of Finance
Terms Expire April 2005
Jere R. Behrman, Professor of Economics
Linda Brown, Professor of Nursing
Ex Officio (2001-2002)
Senate Chair David B. Hackney, Professor of Neuroradiology
Senate Chair-elect Mitchell Marcus, RCA Professor of Artificial Intelligence
Past Senate Chair Gerald J. Porter (Professor of Mathematics)
Ex Officio (2002-2003)
Senate Chair Mitchell Marcus (Professor of Computer & Info. Sci.)
Senate Chair-elect Lance Donaldson-Evans, Professor of Romance Languages
Past Senate David B. Hackney (neuroradiology)

Table 1

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

Group/Condition	Average	Fiscal Year 2000	2001	2002	Compound Cumulative 1992-2001
Full Professors	Median	3.5%	3.8%	4.%	
	Mean	5.0%	5.0%	6.0%	59.6%
Associate Profs	Median	3.9%	4.0%	4.0	
	Mean	5.7%	6.0%	7.9%	64.1%
Assistant Profs	Median	5.0%	5.1%	4.9%	
	Mean	5.9%	6.6%	6.6%	68.7%
All Three Ranks	Mean	5.3%	5.9%	6.7%	
UScityaverage CPI	—	3.7%	3.2%		30.9%
Budget Guidelines	Mean	3.5%	3.5%	3.5%	43.1%

Note: Academic base salary percentage increases pertain to all Penn standing faculty members who continued in the same rank during the periods of time reported. Excluded were all members of the Faculty of Medicine, all Clinician Educators from four other schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted or entered Penn employment during the periods of time reported.

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 for the twelve-month period ending before the beginning of each of three fiscal years

Schools and Disciplinary Areas	Percentage of all Standing Faculty Members with Salary Increases Exceeding Growth in the CPI (Phil.) FY 2000	FY 2001	FY 2002
Annenberg	100%	93%	25%
Dental Medicine	95%	97%	83%
Engineering & Applied Science	94%	87%	69%
Grad Education	100%	93%	76%
Grad Fine Arts	84%	92%	77%
Humanities (A&S)	92%	93%	84%
Law	94%	94%	72%
Natural Science (A&S)	82%	84%	79%
Nursing	100%	89%	62%
Social Science (A&S)	85%	92%	76%
Social Work	87%	88%	79%
Veterinary Medicine	97%	98%	88%
Wharton	93%	94%	88%
Medicine-Basic	NA	NA	72%
All Schools/Areas Combined	91%	92%	82%
Phil. CPI Growth (prior year)	2.34%	2.60	3.2%

Note: Academic base salary increases pertain to all Penn standing faculty members who continued in the same rank during the periods of time reported. Excluded were all members of the Faculty of Medicine, all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted or entered Penn employment during the periods of time reported.

Table 3

Percentage of continuing Penn Full Professors awarded cumulative compounded percentage salary increases exceeding the cumulative compounded percentage growth in the consumer price index (CPI) for Philadelphia for three five-year periods

Schools and Disciplinary Areas	Percentage of all Full Professors with Cumulative Salary Increases Exceeding Growth in the CPI (Phil.) FYs 94-00	FYs 95-01	FYs 96-02
Annenberg	100%	100%	100%
Dental Medicine	100%	100%	100%
Engineering & Applied Science	93%	92%	86%
Grad Education	100%	92%	93%
Grad Fine Arts	91%	90%	82%
Humanities (A&S)	97%	99%	96%
Law	96%	88%	83%
Natural Science (A&S)	90%	87%	80%
Nursing	100%	75%	100%
Social Science (A&S)	93%	93%	83%
Social Work	100%	100%	100%
Veterinary Medicine	97%	97%	95%
Wharton	95%	94%	93%
Medicine-Basic	NA	NA	72%
All Schools/Areas Combined	95%	94%	90%
Cumulative Phil. CPI Growth	14.4%	14.2%	15.2%

Note: Cumulative compounded academic base salary increases pertain to all Penn full professors who continued as full professors during the periods of time reported. Excluded were all members of the Faculty of Medicine,excluding basic, and all Clinician Educators from four schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work).

Table 4

Rank Order of mean salary levels of Penn faculty members by five academic fields in comparison with selected public and private research universities as of the Fall Terms of 1998, 1999, 2000, and 2001

Academic Fields	Rank Order by Year 1998-99	1999-00	2000-01	2001-02
Full Professor				
Natural Sciences	14/24	13/24	12/24	10/20
Soc Sci/Human	11/24	10/24	10/24	8/20
Engineering	13/21	12/21	11/21	11/19
Architecture	4/15	3/15	3/15	5/14
Management	5/18	5/18	6/18	4/15
Associate Profs				
Natural Sciences	16/24	20/24	7/24	4/20
Soc Sci/Human	7/24	7/24	4/24	4/20
Engineering	12/21	12/21	12/21	6/19
Architecture	-	-	-	-
Management	7/18	5/18	6/18	4/15
Assistant Profs				
Natural Sciences	11/24	9/24	12/24	7/20
Soc Sci/Human	16/24	17/24	11/24	8/20
Engineering	17/21	19/21	18/21	12/19
Architecture	12/14	13/14	13/14	10/13
Management	3/18	5/18	5/18	5/15

Note: Salary rank orders pertain to the mean academic base salary levels of Penn standing faculty members from the Sciences (of SAS) and Social Sciences and Humanities (of SAS), and the Schools of Engineering and Applied Science (for engineering), Graduate Fine Arts (for architecture), and Wharton (for management). Rank orders are reported only if the number of faculty members is four or more. Data source: MIT Salary Survey.

Table 5.

Full professor salary comparisons: Percentage differences in mean academic base salary levels of Penn full professors in comparison with salary levels of full professors at a sample of comparable research universities for Academic Years 1986-87, 1996-97, 1997-98, 1998-99, 1999-00, 2000-01

	Full Professor Salaries: Percentage Differences by Year					
University[a]	**1986-87**	**1996-97**	**1997-98**	**1998-99**	**1999-00**	**2000-01**
Harvard	+16.9%	+12.2%	+11.7%	+11.3%	+12.3%	13.1%
Princeton						2.9%
Yale	+6.7%	+4.7%	+3.6%	+4.2%	+3.6%	2.5%
Stanford	+12.8%	+6.4%	+6.1%	+7.4%	+5.5%	2.3%
Chicago	-0.3%	+1.6%	+1.3%	+3.3%	+3.2%	0.9%
Pennsylvania	**$59.6K**	**$100.0K**	**$104.6K**	**$108.4K**	**$114.8K**	**$128.0K**
NYU						-1.3%
Columbia	+3.2%	+1.2%	-1.0%	+0.8%	-1.2%	-2.0%
MIT	+4.7%	+0.1%	-0.4%	-1.3%	-2.7%	-3.8%
Northwestern	-4.9%	-3.9%	-3.1%	-1.7%	-3.1%	-4.5%
Duke	-3.7%	-4.2%	-3.5%	NA	-5.9%	-7.2%
U.C. (Berkeley)	+7.4%	-13.0%	-11.4%	-4.5%	-5.3%	-9.5%
UCLA	+4.5%	-13.9%	-11.5%	-6.5%	-7.6%	-9.6%
Michigan	-6.2%	-12.0%	-12.1%	-10.8%	-12.1%	-14.9%
Carnegie-Mellon	+0.8%	-8.9%	-10.2%	-10.6%	-13.6%	-15.0%
Virginia	-1.0%	-15.8%	-13.1%	-11.0%	-11.8%	-15.9%
N.C. (Chapel Hill)	-10.7%	-17.8%	-17.8%	-18.2%	-18.3%	-19.2%
Texas (Austin)	-16.6%	-20.4%	-21.2%	-22.2%	-22.1%	-22.8%
MN (Twin Cities)	-15.8%	-25.2%	-22.6%	-21.2	-22.0%	-23.8%

Note: 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 and all standing faculty members who are appointed as Clinician Educators from four other schools that have such positions (Dental Medicine, Veterinary Medicine, Nursing, and Social Work). Data source: AAUP Salary Surveys.

[a]Universities are ordered from highest to lowest mean salaries for full professors as of 2000-01. 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.

Table 6

Full Professors: Median academic base salary percentage increases of continuing Penn Full Professors for FY 1999, 2000, and 2001, along with the first and third quartile salary increases

	First Quartile (Q_1), Median (Md.)[a], and Third Quartile (Q_3) Percentage Salary Increases by Year								
	1999-2000			**2000-2001**			**2001-2002**		
School/Area	**Q_1**	**Md.**	**Q_3**	**Q_1**	**Md.**	**Q_3**	**Q_1**	**Md.**	**Q_3**
All Schools		3.5			3.8			4.0	
Annenberg	5.0	8.8	11.5	3.5	3.5	4.0	2.5	3.1	3.1
Dental Medicine	3.5	3.5	4.0	3.5	4.0	5.0	4.0	4.5	5.0
Eng & Applied Sci	3.0	3.7	4.6	3.0	4.0	5.2	3.0	3.9	5.5
Grad Education	4.0	5.0	6.7	3.0	4.3	5.0	4.0	4.1	6.5
Grad Fine Arts	2.5	3.5	5.0	3.0	3.5	4.5	2.5	3.8	4.0
Humanities (A&S)	3.0	3.0	4.0	3.2	3.4	4.5	3.5	4.3	6.7
Law	3.5	5.2	6.6	5.4	6.2	7.7	4.5	5.3	6.3
Medicine -Basic		NA			NA		3.0	3.5	5.5
Natural Sci's (A&S)	2.5	3.0	4.2	3.0	3.4	4.3	3.4	3.8	5.8
Nursing	-	3.5	-	-	3.5	-	-	4.5	
Social Sci's (A&S)	2.9	3.1	4.2	3.1	3.4	4.2	3.5	3.7	5.3
Social Work	-	5.0	-	-	5.0	-	-	5.0	-
Veterinary Med	3.5	3.5	5.0	3.5	3.5	4.0	3.5	3.5	4.0
Wharton	3.8	4.7	5.9	3.5	4.1	5.2	5.4	7.2	10.1
Budget Guideline		3.5			3.5			3.5	

Note 1: The Budget Guideline shown under each rank is for comparison purposes. As per Penn policy, it is a guideline for a salary increment pool for all standing faculty members in each school, but not specifically for each rank.

Note 2: Academic base salary percentage increases pertain to all Penn standing faculty members who continued as full professors during the periods of time reported. Excluded were all members of the Faculty of Medicine, all Clinician Educators from four other schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted or entered Penn employment during the years reported.

[a]A median (Md.) percentage salary increase is the mid-point of the increase within each school/area and rank (i.e., half of all increases were below the median and half were above).Variability of salary increase percentages is indicated by the first quartile (Q_1) and third quartile (Q_3) percentage increases. At the lower end of the salary increase percentages, 25% of all increases were below the Q_1, while 75% were above. At the upper end, 75% of all increases were below the Q_3, while 25% were above. Median increases are reported only if the number of faculty members is four or more. The quartile increases are reported only if the number of faculty members is more than ten.

Table 7

Associate Professors: Median academic base salary percentage increases of continuing Penn Associate Professors for FY 2000, 2001, and 2002, along with the first and third quartile salary increases

	First Quartile (Q_1), Median (Md.)[a], and Third Quartile (Q_3) Percentage Salary Increases by Year								
	1999-2000			**2000-2001**			**2001-2002**		
School/Area	**Q_1**	**Md.**	**Q_3**	**Q_1**	**Md.**	**Q_3**	**Q_1**	**Md.**	**Q_3**
All Schools		3.9			4.0			4.0	
Annenberg	-	-	-	-	-	-	-	-	-
Dental Medicine	-	3.5	-	3.5	3.5	6.2	3.0	3.5	5.0
Eng & Applied Sci	3.3	3.5	4.8	3.4	4.0	5.0	3.5	4.1	8.0
Grad Education	-	4.0	-	-	4.0	-	-	4.0	-
Grad Fine Arts	-	-	-	-	-	-	-	4.5	-
Humanities (A&S)	3.0	3.9	7.7	3.6	5.4	7.9	3.6	5.3	10.7
Law		NA			NA			NA	
Medicine-Basic		NA			NA		3.3	4.0	11.8
Natural Sci's (A&S)	2.8	3.1	4.7	2.5	3.1	5.4	4.1	5.1	22.1
Nursing	3.0	4.1	4.1	2.8	3.5	4.0	2.8	5.0	11.6
Social Sci's (A&S)	2.3	3.0	3.9	3.1	3.4	6.2	3.5	3.7	7.9
Social Work	-	4.5	-	2.1	5.0	5.0	-	4.5	-
Veterinary Med	3.5	4.5	10.4	3.5	4.0	5.8	3.5	4.0	9.3
Wharton	3.5	5.4	8.7	4.0	4.4	6.4	4.3	5.7	10.6
Budget Guideline		3.5			3.5			3.5	

Note 1: The Budget Guideline shown under each rank is for comparison purposes. As per Penn policy, it is a guideline for a salary increment pool for all standing faculty members in each school, but not specifically for each rank.

Note 2: Academic base salary percentage increases pertain to all Penn standing faculty members who continued as associate professors during the periods of time reported. Excluded were all members of the Faculty of Medicine, except basic scientists, all Clinician Educators from four other schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted or entered Penn employment during the years reported.

[a]A median (Md.) percentage salary increase is the mid-point of the increase within each school/area and rank (i.e., half of all increases were below the median and half were above). Variability of salary increase percentages is indicated by the first quartile (Q_1) and third quartile (Q_3) percentage increases. At the lower end of the salary increase percentages, 25% of all increases were below the Q_1, while 75% were above. At the upper end, 75% of all increases were below the Q_3, while 25% were above. Median increases are reported only if the number of faculty members is four or more. The quartile increases are reported only if the number of faculty members is ten or more.

Table 8

Assistant Professors: Median academic base salary percentage increases of continuing Penn Assistant Professors for FY 2000, 2001, and 2002 along with the first and third quartile salary increases

	First Quartile (Q_1), Median (Md.)[a], and Third Quartile (Q_3) Percentage Salary Increases by Year								
	1999-2000			2000-2001			2001-2002		
School/Area	Q_1	Md.	Q_3	Q_1	Md.	Q_3	Q_1	Md.	Q_3
All Schools		5.0			5.1			4.9	
Annenberg	-	-	-	-	-	-	-	-	-
Dental Medicine	-	3.5	-	3.5	4.0	5.0	3.5	5.3	11.9
Eng & Applied Sci	4.3	4.6	5.1	4.0	5.8	8.0	3.5	5.6	8.1
Grad Education	-	5.0	-	4.5	5.0	5.0	-	5.5	-
Grad Fine Arts	-	3.5	-	3.5	3.5	4.5	-	10.0	-
Humanities (A&S)	3.0	4.2	6.0	3.5	5.5	9.1	4.0	6.5	8.7
Law	-	-	-	-	-	-	-	6.7	-
Medicine-Basic	-	-	-	-	-	-	3.5	4.0	15.3
Natural Sci's (A&S)	4.1	5.0	8.4	4.9	5.4	8.0	5.3	6.0	8.0
Nursing	-	3.5	-	4.0	4.0	7.6	-	3.5	-
Social Sci's (A&S)	3.0	3.1	5.5	3.3	3.4	5.4	3.6	4.1	8.3
Social Work	-	-	-	4.0	4.5	6.1	-	3.0	-
Veterinary Med	3.5	3.5	6.0	4.0	5.0	11.6	3.5	4.0	7.0
Wharton	5.4	6.4	9.3	4.9	5.5	6.1	4.2	4.6	5.1
Budget Guideline		3.5			3.5			3.5	

Note 1: The Budget Guideline shown under each rank is for comparison purposes. As per Penn policy, it is a guideline for a salary increment pool for all standing faculty members in each school, but not specifically for each rank.

Note 2: Academic base salary percentage increases pertain to all Penn standing faculty members who continued as assistant professors during the periods of time reported. Excluded were all members of the Faculty of Medicine,except basic scientists, all Clinician Educators from four other schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted or entered Penn employment during the years reported.

[a]A median (Md.) percentage salary increase is the mid-point of the increase within each school/area and rank (i.e., half of all increases were below the median and half were above). Variability of salary increase percentages is indicated by the first quartile (Q_1) and third quartile (Q_3) percentage increases. At the lower end of the salary increase percentages, 25% of all increases were below the Q_1, while 75% were above. At the upper end, 75% of all increases were below the Q_3, while 25% were above. Median increases are reported only if the number of faculty members is four or more. The quartile increases are reported only if the number of faculty members is ten or more.

Table 9

Mean academic base salary levels of continuing Penn standing faculty members by rank

		Salary		Ratio to Assist. Prof. Salary Level	
Rank	Academic Year	Average	Amount	Not Weighted	Weighted[a]
Full Professor	1999-00	Mean	$117,092	1.69	1.84
		Median	106,338		
	2000-01	Mean	121,424	1.66	1.79
		Median	110,300		
	2001-02	Mean	127,446	1.61	1.78
		Median	112,546		
Associate Prof.	1999-00	Mean	79,519	1.14	1.24
		Median	74,000		
	2000-01	Mean	83,890	1.15	1.25
		Median	78,600		
	2001-02	Mean	90,050	1.14	1.23
		Median	82,187		
Assistant Prof.	1999-00	Mean	69,417	1.00	1.00
		Median	60,450		
	2000-01	Mean	73,187	1.00	1.00
		Median	64,760		
	2001-02	Mean	79,003	1.00	1.00
		Median	75,000		

Note: Mean academic base salary levels are based on all Penn standing faculty members who continued in the same rank in FY 2000, FY 2001, and FY 2002 from their respective prior years. Excluded were all members of the Faculty of Medicine, all Clinician Educators from four other schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted effective for each year reported.

[a]The weighted ratios were computed by the following procedure: first, the ratios for continuing faculty members for each school were computed (except for Annenberg, which had no assistant professors, and Law, which had but one assistant professor); next a mean weighted ratio was computed (weighted for the number of continuing faculty members at each rank in each school).

Table 10

Variability of academic base salary levels among schools/areas[a]: First, second, and third quartile median salary levels by rank and year

		Quartiles[b] of Median School Salaries					
Rank	Academic Year	Q_1	Q_2	Q_3	IQR[b]	Ratio: IQR to Median[c]	Number of Areas
Full Prof.	1999-00	$95.1K	$103.7K	$122.0K	$26.9	.26	13
	2000-01	$98.2K	$111.8K	$125.1K	$26.9	.24	13
	2001-02	$101.5K	$115.3K	$135.2K	$33.7K	.29	14
Assoc. Prof.	1999-00	$63.7K	$76.7K	$88.4K	$24.7	.32	12
	2000-01	$64.2K	$79.1K	$91.1K	$26.9	.34	12
	2001-02	$70.3K	$82.1K	$97.2K	$26.9K	.33	13
Assis. Prof.	1999-00	$51.6K	$54.3K	$71.0K	$19.4	.36	12
	2000-01	$53.5K	$59.0K	$73.9K	$20.4	.35	12
	2001-02	$56.1K	$65.0K	$80.4K	$24.3K	.37	13

Note: Median academic base salary levels for Penn's schools/areas are based on standing faculty members who continued in the same rank from FY 1999 to FY 2000 (the 1999-00 data), from FY 2000 to FY 2001, and from FY 2001 to FY 2002. Excluded were all members of the Faculty of Medicine, all Clinician Educators from four other schools (Dental Medicine, Veterinary Medicine, Nursing, and Social Work) that have such positions, and faculty members who were promoted effective for each year reported.

[a]The 14 schools/areas used for this analysis at the full professor level are the same as those listed in Table 3. The number of schools used at the associate and assistant professor levels was slightly less because the numbers of faculty members within these ranks was very low for a few schools.

[b]Variability of median salary levels among schools/areas is reported by quartile. At the lower end of the median salary level distribution, 25% of the median salary levels of all schools/areas were below the first quartile (Q_1), while the other 75% were above. In the middle, 50% of the median salary levels of all schools/areas were below the second quartile (Q_2, also called the median), while the other 50% were above. At the upper end, 75% of median salary levels of all schools were below the third quartile (Q_3), while the other 25% were above. Using Q_3 and Q_1, a measure of variability of school median salaries termed the interquartile range (IQR) is then computed by subtracting the lower quartile salary (Q_1) from the upper quartile salary (Q_3).

[c]This is a ratio of (a) the variability of school median salaries (i.e., the ICR) to (b) the average of these school median salaries. With this ratio, it is possible to make meaningful comparisons across years, and across professorial ranks, in the variability of salaries. The IQR is divided by the median salary (Q_2), thereby indexing the variability to the general level of salaries and making comparisons of variability more meaningful.