

# **SALARY COMPRESSION**

It was the consensus of the Committee that specific recommendations for salary increases could only be made after fundamental issues were addressed:

- 1) What is salary compression?
- 2) What is the relevant faculty population?
- 3) How can compression in faculty salaries be identified?

## **SALARY COMPRESSION DEFINED**

To address the first issue, the following definition was taken from the extant literature and agreed to by the Committee:

“Salary compression is an internal problem initiated by external market conditions and exacerbated by other factors. Two points of comparison are typically used to measure salary compression: salaries of junior faculty versus salaries of senior faculty. When the salary differential between junior and senior faculty is smaller than *it should be* (emphasis added), compression occurs. Further, because junior faculty may be defined as those newly hired or newly promoted, salary compression can occur between ranks as well as within ranks. A related term ‘salary inversion’ occurs when salary compression, left unexamined or unadjusted, results in junior faculty salaries greater than senior faculty salaries. Like salary compression, salary inversion can occur between ranks as well as within ranks. Although the reverse is not necessarily true, whenever inversion exists compression also must exist.”

## **RELEVANT FACULTY POPULATION**

The second issue addressed by the Committee focused on how to define the faculty population for purpose of identifying salary compression. Of particular concern was how to identify junior faculty.

The faculty salaries used in this study were those reported at the beginning of the Fall 1999 Semester. The salaries of those assistant professors whose appointment to WMU began in the Fall of 1999 were based on the market value at the time of appointment, thus these assistant professors were not included in this study.

Likewise, assistant professors who had only completed one full year in rank would not have been in the bargaining unit long enough to have had their salaries compressed. These faculty were also excluded from in this study.

According to the study's definition of salary compression, faculty who were newly promoted to associate professor or professor are considered junior faculty; however, for purposes of this study on salary compression, they were included. To eliminate them would be removing significant contributions to salary differences between, as well as within, ranks. Having defined faculty in this manner, this study used a faculty population of 606 bargaining unit faculty: 235 professors; 248 associate professors; and 123 assistant professors.

### **YEARS IN RANK ADJUSTMENTS**

Another adjustment was made for faculty who had gone two years beyond their contractual eligible time for promotion. To ensure that these faculty were not unduly and disproportionately rewarded with significant salary increases, associate professors were given credit of one year for every four years in rank beyond nine

years. Assistant professors were given credit of one year for every four years in rank beyond seven years in rank. For administrators who returned to the faculty, the years in rank reflect those as a bargaining unit faculty member and not total years in rank. Finally, because the basic unit of analysis to determine salary compression is the department, a department was split if it contained substantially different, well-defined fields with substantially different market salaries. This resulted in the splitting of the Department of Business Information Systems into Computer Information Systems and Business Communication. In addition, the Department of Finance and Commercial Law was split into Finance and Commercial Law. Consequently, 55 departments, rather than 53, were used in the subsequent analysis of salary compression.

#### **FACULTY VARIABLES CONSIDERED**

The Committee recognized that existing salary differences are a function of seven variables: starting salary; contractual across-the-board increases; contractual promotion increments; merit awards; market adjustments; awards; and miscellaneous increases. However, no attempt was made to decompose or control these factors in the analysis of salary differences for two reasons. First, eliminating these variables from faculty current salaries would be inconsistent with the definition of salary compression. Salary compression deals with differences in existing salaries, not what salaries would be if these variables were eliminated. Second, the elimination of these variables from faculty salaries would result in identifying salaries stated in each faculty member's appointment letter. Once again, this would be inconsistent with the focus of this study.

To address the issue of which variables would likely have a demonstrable and systematic affect on salary differentials, the Committee relied on the existing salary compression literature and the model used in the 1986 WMU/AAUP Salary Study.

These references identified four variables:

1. The base funded salary for 1999-2000 exclusive of Spring, Summer, Continuing Education, and other sources of earnings.
2. The rank (assistant professor, associate professor, professor) of each bargaining unit member held on September 1, 2000.
3. The years in rank as of the end of the 1998-1999 academic year.
4. The FTE standard for academic year FTE = 1.00 and fiscal year FTE = 1.25.

These variables were used to determine the regression lines for each rank in each department. When salary compression was identified, the regression intercepts were adjusted. Finally, as explained later, these adjusted regression intercepts were used in the analysis of salary compression between ranks in each department.

## **SALARY COMPRESSION IDENTIFIED**

To identify salary compression within the context of its definition, the third issue, the Committee had a two-fold task: 1) to determine what the salary differentials between junior and senior faculty *should be*, and 2) to adopt a procedure that would address the differential issue and allow the Committee to compare faculty salaries between and within ranks in each department.

## **SALARY DIFFERENTIALS**

The Committee agreed to use the model and procedures outlined in the 1986 WMU/AAUP Salary Study. The Study used regression analysis to derive a regression line, which estimated salaries by longevity, for each of three academic ranks: assistant; associate; and professor.

Using a data set of N = 235 professors, a least squares regression line was fitted through each department to determine predicted salaries, given longevity. The regression lines were computed using a common slope for all departments, thus resulting in 55 parallel lines for 55 departments. Then, an overall university-wide regression line was computed by taking a weighted average of the 55 lines using the number of professors in each department as weights. This resulted in a university line approximately in the middle of, and parallel to, the 55 lines. An identical analysis was done for N = 248 associate professors and N = 123 assistant professors. These analyses resulted in the following university regression lines:

Professor: Predicted salary = \$68,326.2 + \$584.76 (years in rank)

Associate Professor: Predicted salary = \$55,126.7 + \$374.71 (years in rank)

Assistant Professor: Predicted salary = \$44,346.8 + \$472.61 (years in rank)

NOTE: Regression line:  $y = a + b(x_1)$

y = predicted Salary

a = y(regression intercept)

b = regression coefficient

$x_1$  = longevity or years in rank

Because a common slope for all departments was used, the departmental regression coefficients for professor, associate professor, and assistant professor are the same as those in the university regression lines for these ranks.

### **BETWEEN-RANK COMPRESSION**

To address what salary differentials between ranks *should be*, the Committee agreed to use the rank compression algorithm outlined in the 1986 WMU/AAUP Salary Study. In that study, if the salary differentials between ranks in a department were less than one half of the university differentials between ranks, these departments were considered “compressed” and adjusted accordingly.

In the present study, the salary differential (university intercepts) for professors is approximately 123.9% of the university intercept for associate professors. The salary differential (university intercept) for associate professors is approximately 124.3% of the university intercepts for assistant professors. Thus, if the departmental starting salary (regression intercept) for a professor is less than 12% of the starting salary (regression intercept) for associate professors in that same department, then the starting salary for professors is adjusted upward (see *Appendix A*).

The departmental starting salaries (regression intercepts) of associate professors and assistant professors are compared in the same way, and, if indicated, a similar adjustment is made in the starting salaries (regression intercept) of associate professors. No adjustment is made for assistant professors.

The use of this procedure identified 13 between-rank compressions. These between-rank adjustments and the new departmental regression intercepts (starting salaries) can be found in *Appendix B*.

## **WITHIN-RANK COMPRESSION**

To address what salary differentials within ranks should be, a regression model was used to arrive at a predicted salary for each faculty member. The predicted salary values were determined for each rank in each department with the following model:

$$\begin{array}{rcccl} \text{Predicted} & & \text{Adjusted} & & \\ \text{Salary} & = & \text{Regression} & + & \text{Regression (X}_1\text{)} \\ & & \text{y-intercept} & & \text{Coefficient} \end{array}$$

The regression intercept represents the salary for all faculty members in a specific rank and department. The regression coefficient for each rank is given in the university-wide regression lines. The  $x_1$  variable is the number of years a faculty member has been in the academic rank.

## **BASIS FOR SALARY ADJUSTMENTS**

Having defined salary compression, relevant faculty population, and the between- and within-rank salary compression procedures, the Committee determined that salary adjustments would consider: 1) the degree of compression; and 2) the amount of salary compression funds (approximately \$232,000).

Because some faculty salaries were more compressed than others, the Committee decided to bring the more compressed faculty up to 95% of their predicted salaries. Further, because of the limited pool of compression money, these faculty could only receive 73.5% of the difference between their actual and 95% of their predicted salaries. More formally, the basis for salary adjustment is:

$$(.735) * (95\% \text{ of predicted salary} - \text{actual salary})$$

Finally, some faculty received or were to receive a market adjustment to their salaries during the time period of this study. If the market adjustment was greater than the

salary compression adjustment, they were not recommended for an adjustment. If the market adjustment was less than the salary compression adjustment, they would receive the difference.

An example of how to compute the salary-compression adjustment for individual faculty and a list of all faculty adjustments, unidentified by name, can be found in *Appendix C*.

The Committee believes that under no circumstances should the list of faculty salary-compression adjustments be published or distributed by either the University or the Chapter, and that the faculty should be notified individually, by letter, of their adjustment. To this end, we have submitted the names of faculty and specific salary adjustment recommendations under separate cover.

The Salary Compression Committee worked amicably together. We believe that the procedures and model we utilized satisfies the requirements given in our charge.

**APPENDIX A**  
**BETWEEN-RANKS**  
**SALARY COMPRESSION ADJUSTMENTS**

The university regression intercepts (estimated starting salaries) for professors and associate professors were taken from the university regression lines, and applied in the algorithm as follows:

|  |      |  |
|--|------|--|
| Professor<br>Starting<br>Salary        | ---- | Associate<br>Professor<br>Starting<br>Salary |
| -----                                  |      |  |
| Associate Professor<br>Starting Salary |      |  |

**OR**

$$\mathbf{\$68,326 - \$55,127/\$55,127 = 23.9\%}$$

If the difference between the departmental regression intercepts (estimated starting salary) between professor and associate professor is less than one-half (12%) of the corresponding quantity for university regression intercepts, the departmental professor regression intercept is adjusted *upward* by a factor depending on the relative numbers in the two ranks.

1. If the number of professors is less than the number of associate professors, then the new regression intercept (starting salary) for professors is increased to equal 112% of the regression intercept (starting salary) for associate professors.

2. If the number of professors is greater than the number of associate professors, then the new regression intercept (starting salary) for professors is increased only by a fraction of the amount of increase. The fraction is the number of associate professors (A) relative to the number of professors (P). The A/P fraction is used to prevent a relatively small number of associate professors from generating a significant adjustment to a larger group of professors.

A similar adjustment is made in the regression intercepts (starting salary) of associate professors using the following:

$$\frac{\text{Associate Professor Starting Salary} - \text{Assistant Professor Starting Salary}}{\text{Assistant Professor Starting Salary}}$$

**OR**

$$\mathbf{\$55,127 - \$44,347 / \$44,347 = 24.3\%}$$

Assistant professor intercepts were not adjusted because instructors were not part of the study. The 13 between-rank adjustments and the departmental regression intercepts are found in *Appendix B*.

**APPENDIX B**  
**BETWEEN-RANKS**  
**REGRESSION INTERCEPT ADJUSTMENTS**

| <u>Department<br/>Number</u> | <u>Professor<br/>Adjustments</u> | <u>Associate<br/>Professor<br/>Adjustments</u> |
|------------------------------|----------------------------------|--|
| 121110                       | \$1,750                          |  |
| 121120                       | \$1,946                          |  |
| 121161                       | \$1,832                          |  |
| 122010                       | \$1,123                          |  |
| 122021                       | \$7,149                          |  |
| 122040                       | \$3,372                          |  |
| 122050                       | \$ 268                           | \$ 5,105                                       |
| 125228                       |                                  | \$11,238                                       |
| 125210                       | \$ 773                           |  |
| 125250                       | \$ 206                           |  |
| 128040                       |                                  | \$ 3,864                                       |
| 530430                       |                                  | \$ 1,234                                       |

## APPENDIX C

The following is an example of how salary compression adjustments were determined for a professor, associate professor and assistant professor:

Professor (OBS. 74):                      Actual Salary \$83,337  
Number of Years in Rank 15  
Department Regression Intercept \$83,499  
University Regression Coefficient \$584.76

Predicted Salary:                               $83,499 + 584.76(15) = \$92,271$   
95% of Predicted Salary:                       $92,271(.95) = \$87,657$   
95% Predicted Salary – Actual Salary:       $87,657 - 83,337 = \$4,270$   
Final Salary Adjustment:                       $4,270(.735) = \$3,138$

Associate Professor (OBS. 163):              Actual Salary \$48,742  
Number of Years in Rank 3  
Department Regression Intercept \$53,754  
University Regression Coefficient \$374.71

Predicted Salary:                               $53,754 + 374.71(3) = \$54,878$   
95% of Predicted Salary:                       $54,878(.95) = \$52,134$   
95% Predicted Salary – Actual Salary:       $52,134 - 48,742 = \$3,392$   
Final Salary Adjustment:                       $3,392(.735) = \$2,493$

Assistant Professor (OBS. 48.6):              Actual Salary \$36,409  
Number of Years in Rank 4  
Department Regression Intercept \$39,719  
University Regression Coefficient \$472.61

Predicted Salary:                               $39,719 + 472.61(4) = \$41,609$   
95% of Predicted Salary:                       $41,609(.95) = \$39,529$   
95% Predicted Salary – Actual Salary:       $39,529 - 36,409 = \$3,120$   
Final Salary Adjustment:                       $3,120(.735) = \$2,293$