

WSU Salary Equity Study: Faculty Results

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Salary Task Force – 2019/2020

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- Jill McCluskey and Joshua Tibbitts completed the empirical analysis and wrote the first draft of the report. Many individuals provided comments and edits, especially Laura Hill, Catherine Cooper, and Melanie-Angela Neuilly.

Purpose of this Study

- This report summarizes work conducted AY 2019/2020 by the Salary Study Task Force, charged with the planning and oversight of an annual salary equity study of the WSU system.
- The study was motivated by the need to develop a robust statistical approach to be used as a model for a biannual analysis of salary equity for WSU employees, to guide data-driven recommendations for policy and processes that promote institutional salary equity, and to provide unit leadership with contextual information of the salaries of their employees.
- This study is a high-level review of WSU salary information.
 - It shows trends in WSU that can be used to inform future institutional actions and policy decisions.
 - However, it does not, in and of itself, demonstrate pay inequity in each instance.
 - A pay inequity review requires analysis of all factors related to an individual's pay.

Preview - Key Findings

- Summary statistics show a gender disparity in salaries and promotion.
- When controlling for variables including experience, academic rank, and field, career-track faculty women earn approximately 6.4 percent less than their male counterparts in the career-track sample. This result is statistically significant at the 99 percent level of confidence.
- When controlling for variables including experience, academic rank, and field, within tenure-line faculty, women earn 2.6 percent less annual salary than men, on average; this result is statistically significant at the 90 percent level of confidence.
- Summary statistics and regressions controlling for variables including experience, academic rank, and field show no ethnic/racial disparity regarding annual salary at WSU.
- Some control variables, most notably race/ethnicity, have missing data (see Introduction, below). Results may be limited by missing information.

Data

- IR annual employment information on each individual faculty's pay rate, sex, tenure status, year of employment at WSU, full time equivalency (FTE), appointment (e.g. 9 or 12 mos.), faculty rank/title, academic unit & college.
- Individual faculty ethnicity from the CCR at WSU.
- Part-time faculty (FTE < 0.75) are dropped.
- Sample consists of 1,704 faculty members for the year 2019
 - 966 tenure-line faculty members
 - 738 career-track faculty members.
 - Library faculty are not included in this analysis.

Table 2: Descriptive Statistics, Career-Track Faculty**ND = Not disclosed to preserve confidentiality (less than 5 individuals)**

Variable Name	Description	Male	Female
Salary	Yearly salary	\$85,875 (56031)	\$73,996 (40983)
Experience at WSU	Years employed at WSU	6.97 (6.84)	7.35 (6.73)
Director	1 if Director, 0 otherwise	2.64% (9/341)	3.02% (12/397)
Exec. Admin	1 if Dean or Above, 0 otherwise	ND	ND
Administration	1 if in Administration, 0 otherwise	2.35% (8/341)	2.02% (8/397)
Assistant Research Professor	1 if Assistant Research Prof., 0 otherwise	6.16% (21/341)	5.54% (22/397)
Associate Research Professor	1 if Assoc. Research Prof., 0 otherwise	ND	ND
Clinical Assistant Professor	1 if Clinical Assist. Prof., 0 otherwise	22.29% (76/341)	24.43% (97/397)
Clinical Associate Professor	1 if Clinical Associate Prof., 0 otherwise	16.13% (55/341)	15.37% (61/397)
Clinical Professor	1 if Clinical Professor, 0 otherwise	6.45% (22/341)	4.03% (16/397)
Instructor	1 if Instructor, 0 otherwise	19.65% (67/341)	28.97% (115/397)
Research Associate	1 if Research Assoc., 0 otherwise	11.44% (39/341)	7.56% (30/397)
Research Professor	1 if Research Prof., 0 otherwise	1.76% (6/341)	ND
Senior Instructor	1 if Senior Instructor, 0 otherwise	2.93% (10/341)	6.55% (26/397)
Staff Scientist	1 if Staff Scientist, 0 otherwise	3.52% (12/341)	ND
Asian American	1 if Asian Amer. 0 otherwise	4.99% (17/341)	6.55% (26/397)
African American	1 if African Amer. 0 otherwise	1.47% (5/341)	1.26% (5/397)
Decline to State	1 if decline to state ethnicity, 0 otherwise	35.19% (120/341)	22.42% (89/397)
Hispanic	1 if Hispanic 0 otherwise	4.69% (16/341)	5.29% (21/397)
Other	1 if other ethnicity 0 otherwise	ND	ND
White	1 if Caucasian 0 otherwise	53.08% (181/341)	63.48% (252/397)

In Career-Track faculty,
women make up 54%
(397 women, 341 men).

Table 3: Descriptive Statistics, Tenure-Line Faculty

ND = Not disclosed to preserve confidentiality (less than 5 individuals)

Variable Name	Description	Male	Female
Salary	Yearly salary	\$128,968 (64536)	\$106,929 (47044)
Experience	Years since final degree	21.06 (11.05)	16.84 (10.13)
Experience at WSU	Years of employment at WSU	14.51 (10.59)	12.15 (9.57)
Early Tenure	1 if earned tenure in less than 6 years, 0 otherwise	23.82% (146/613)	10.20% (36/353)
Director	1 if Director, 0 otherwise	3.10% (19/613)	2.27% (8/353)
Chair	1 if department chair, 0 otherwise	2.12% (13/613)	2.27% (8/353)
Exec. Admin	1 if Dean or above, 0 otherwise	2.61% (16/613)	2.27% (8/353)
Assistant Professor	1 if Assistant Prof. 0 otherwise	17.78% (109/613)	28.61% (101/353)
Associate Professor	1 if Assoc. Prof. 0 otherwise	34.26% (210/613)	37.68% (133/353)
Professor	1 if Full Prof. 0 otherwise	43.56% (267/613)	30.88% (109/353)
Regents' Professor	1 if Regents Prof. 0 otherwise	3.26% (20/613)	1.13% (4/353)
Asian American	1 if Asian Amer. 0 otherwise	14.03% (86/613)	7.93% (28/353)
African American	1 if African Amer. 0 otherwise	0.98% (6/613)	ND
Decline to State	1 if decline to state ethnicity, 0 otherwise	30.51% (187/613)	24.36% (86/353)
Hispanic	1 if Hispanic 0 otherwise	2.28% (14/613)	3.97% (14/353)
Other	1 if other ethnicity 0 otherwise	1.96% (12/613)	2.55% (9/353)
White	1 if Caucasian 0 otherwise	50.24% (308/613)	60.62% (214/353)

In tenure-line faculty, women only account for 36.5% (353 women, 613 men)

Modeling Approach

- To analyze salary differences, we use the log of yearly salary as the dependent variable, adjusted for FTE.

$$\ln(\text{salary}) = \beta_0 + \beta_1 \text{female} + \beta_2 x_2 + \dots + \beta_n x_n + \varepsilon$$

- Where β_1 is the coefficient of interest, which indicates female, x_2 to x_n are explanatory variables, and ε is a residual term.
- We estimate tenure-line and career-track faculty separately. We argue that within-group comparisons for tenure-line and career-track faculty are more appropriate than between-group comparisons among the same groups.
- **Caveat:** Due to possible inherent biases in the control variables (e.g. gender biases in the hiring process, the promotion process, and awarding of tenure), it may be useful to estimate models where different control variables are omitted.
 - For example, using faculty rank as a control variable may understate the gender wage gap by masking possible gender biases in the promotion process.

Table 4: OLS Regression Results for Career-Track Faculty

Dependent variable: log salary

Variables	Full	Male	Female	Significant Differences
Female	-0.064*** (0.019)	-	-	-
Experience at WSU	-0.000 (0.001)	0.001 (0.002)	-0.001 (0.002)	No
Director	0.252*** (0.085)	0.212** (0.091)	0.430*** (0.149)	No
Exec. admin	0.930*** (0.172)	0.850*** (0.271)	1.078*** (0.151)	No
Rank (Asst. Res. Prof.)				
Administration	0.542*** (0.123)	0.772*** (0.139)	0.166 (0.191)	Yes**
Associate Research Professor	0.174** (0.069)	0.138* (0.079)	0.290 (0.180)	Yes***
Clinical Assistant Professor	0.178*** (0.045)	0.128* (0.067)	0.243*** (0.069)	Yes***
Clinical Associate Professor	0.340*** (0.047)	0.334*** (0.070)	0.342*** (0.070)	Yes***
Clinical Professor	0.628*** (0.059)	0.564*** (0.081)	0.706*** (0.090)	Yes***
Extension Director	0.267** (0.110)	0.378** (0.181)	0.220* (0.120)	No
Extension Regional Specialist	0.023 (0.097)	0.114 (0.154)	-0.058 (0.113)	No
Instructor	-0.060 (0.048)	-0.044 (0.070)	-0.039 (0.073)	Yes***
Research Associate	-0.248*** (0.052)	-0.229*** (0.071)	-0.252*** (0.078)	Yes**
Research Professor	0.711*** (0.116)	0.713*** (0.150)	0.666*** (0.100)	Yes**
Senior Instructor	-0.010 (0.057)	-0.094 (0.096)	0.064 (0.081)	Yes***
Staff Scientist	-0.031 (0.094)	-0.034 (0.102)	-0.019 (0.103)	Yes**

- When controlling for variables including experience, academic rank, and field, career-track faculty women earn significantly less than their male counterparts in the career-track sample.

Career-track results continued

Variables	Full	Male	Female	Significant Differences
Location (Pullman)				
Other	0.099*** (0.035)	0.125** (0.051)	0.060 (0.047)	No
Spokane	0.083* (0.044)	0.105 (0.082)	0.107** (0.053)	No
Tri-Cities	0.011 (0.034)	0.014 (0.048)	0.015 (0.051)	No
Vancouver	0.059** (0.030)	0.045 (0.052)	0.060* (0.032)	No
Ethnicity (White)				
Asian American	0.029 (0.044)	0.023 (0.068)	0.055 (0.060)	No
African American	0.156* (0.084)	0.286** (0.133)	0.091 (0.057)	No
Decline to State	-0.013 (0.020)	-0.030 (0.027)	0.008 (0.033)	No
Hispanic	0.072** (0.036)	-0.023 (0.075)	0.100** (0.039)	No
Other	-0.104 (0.098)	-0.331** (0.131)	0.015 (0.110)	Yes**

There is no evidence of bias due to race/ethnicity.

Caveats: We have some missing data (decline to state), which may be non-random. Also the numbers are small.

Variables Unit (Animal Science)	Full	Male	Female	Significant Differences
Arts	-0.509*** (0.107)	-0.435** (0.177)	-0.589*** (0.136)	No
Biomedical Sciences	0.016 (0.111)	0.071 (0.192)	-0.004 (0.141)	No
Business	0.070 (0.110)	0.182 (0.180)	0.057 (0.153)	No
Chemistry	-0.376*** (0.105)	-0.226 (0.175)	-0.579*** (0.141)	No
Communication	-0.138 (0.106)	0.060 (0.182)	-0.342** (0.136)	Yes*
Education	-0.330*** (0.106)	-0.309* (0.183)	-0.423*** (0.137)	No
Engineering	-0.020 (0.103)	0.101 (0.178)	-0.236* (0.142)	No
Entomology	0.213** (0.100)	0.293 (0.187)	0.139 (0.114)	No
Extension	-0.077 (0.124)	-0.083 (0.210)	-0.095 (0.141)	No
Human Development	-0.283** (0.117)	-0.077 (0.271)	-0.407*** (0.142)	No
Humanities	-0.476*** (0.103)	-0.409** (0.176)	-0.573*** (0.134)	No
Biological Chemistry	-0.072 (0.116)	-0.065 (0.182)	-0.114 (0.152)	No
International Programs	-0.380*** (0.123)	-0.489** (0.200)	-0.413*** (0.153)	No
Mathematics	-0.256** (0.110)	-0.175 (0.182)	-0.354** (0.148)	No
Medicine	0.274** (0.115)	0.484** (0.196)	0.028 (0.150)	Yes*
Nursing	-0.192* (0.112)	0.369* (0.203)	-0.346** (0.143)	Yes***
Pharmacy	0.067 (0.108)	0.048 (0.194)	0.017 (0.137)	No
Physics and Astronomy	0.128 (0.129)	0.238 (0.193)	-0.422*** (0.145)	Yes***
Plant Sciences	-0.035 (0.112)	0.077 (0.179)	-0.136 (0.145)	No
Policy	-0.369*** (0.131)	-0.296 (0.197)	-0.494** (0.204)	No
Psychology	-0.245** (0.110)	-0.093 (0.178)	-0.383*** (0.137)	No

Career-track results continued

Due to constraints on sample size within departments/colleges, many departments/colleges were combined to improve statistical efficiency.

Variables	Full	Male	Female	Significant Differences
Biological Sciences	-0.218* (0.112)	-0.061 (0.194)	-0.395*** (0.141)	No
Economic Sciences	-0.089 (0.122)	0.018 (0.193)	-0.205 (0.204)	No
Sch of the Environment	-0.132 (0.109)	0.024 (0.179)	-0.290** (0.140)	No
Sociology	0.289 (0.182)	0.497*** (0.176)	0.232 (0.210)	No
Veterinary Medicine	0.172 (0.105)	0.279 (0.183)	0.056 (0.134)	No
Constant	11.677*** (0.155)	11.817*** (0.212)	11.326*** (0.223)	-
Observations	738	341	397	
R-square	0.770	0.819	0.770	

Table 5: OLS Regression Results for Tenure-Track Faculty

Dependent variable: log salary

Variables	Full	Male	Female	Significant Differences
Female	-0.026* (0.015)	-	-	-
Experience at WSU	-0.007*** (0.001)	-0.008*** (0.001)	-0.005*** (0.002)	No
Director	0.277*** (0.049)	0.274*** (0.055)	0.282*** (0.104)	No
Chair	0.374*** (0.057)	0.320*** (0.073)	0.400*** (0.091)	No
Exec. admin	0.723*** (0.076)	0.816*** (0.081)	0.587*** (0.124)	No
Rank (Assistant Professor)				
Associate Professor	0.173*** (0.018)	0.194*** (0.023)	0.140*** (0.031)	No
Extension E-2	0.031 (0.066)	0.283*** (0.094)	0.012 (0.057)	Yes**
Extension E-3	0.129** (0.059)	0.124* (0.065)	-	No
Extension E-4	0.403** (0.172)	0.443 (0.279)	0.427* (0.258)	No
Professor	0.502*** (0.025)	0.529*** (0.030)	0.453*** (0.052)	No
Regents' Professor	0.947*** (0.083)	1.023*** (0.080)	0.652** (0.296)	No

Tenure-track results continued

Table 5: OLS Regression Results for Tenure-Track Faculty

Dependent variable: log salary

Variables	Full	Male	Female	Significant Differences
Location (Pullman)				
Other	-0.004 (0.039)	-0.037 (0.050)	0.031 (0.060)	No
Spokane	-0.056 (0.075)	0.010 (0.084)	-0.119 (0.112)	No
Tri-Cities	-0.008 (0.036)	-0.015 (0.052)	-0.025 (0.055)	No
Vancouver	-0.055*** (0.021)	-0.055* (0.029)	-0.051 (0.032)	No
Ethnicity (White)				
Asian American	-0.011 (0.024)	-0.016 (0.029)	-0.028 (0.046)	No
African American	-0.050 (0.068)	-0.062 (0.049)	-0.104 (0.248)	No
Decline to State	0.003 (0.017)	-0.016 (0.023)	0.024 (0.030)	No
Hispanic	0.065 (0.042)	0.011 (0.053)	0.102 (0.067)	No
Other	0.035 (0.059)	0.055 (0.088)	0.058 (0.070)	No

Table 5: OLS Regression Results for Tenure-Track Faculty

Dependent variable: log salary

Variables	Full	Male	Female	Significant Differences
Unit (Animal Sci.)				
Anthropology	-0.431*** (0.066)	-0.439*** (0.081)	-0.455*** (0.092)	No
Apparel Merch Design & Textile	-0.187*** (0.060)	-0.148* (0.080)	-0.257*** (0.076)	No
Arts	-0.469*** (0.064)	-0.429*** (0.084)	-0.524*** (0.091)	No
Biological System	0.235*** (0.081)	0.315*** (0.098)	0.029 (0.150)	No
Engineering	0.345*** (0.067)	0.381*** (0.086)	0.308*** (0.092)	No
Chemistry	-0.084 (0.065)	-0.052 (0.083)	-0.024 (0.133)	No
Communication	-0.133* (0.072)	0.012 (0.161)	-0.213*** (0.080)	No
Education	-0.234*** (0.061)	-0.210*** (0.081)	-0.282*** (0.075)	No
Engineering	0.039 (0.061)	0.083 (0.079)	0.004 (0.084)	No
Entomology	0.146 (0.101)	0.279** (0.116)	-0.273*** (0.090)	Yes***
Extension	-0.232*** (0.066)	-0.140 (0.085)	-0.360*** (0.087)	Yes**
Human Development	-0.210*** (0.072)	-0.265*** (0.095)	-0.244*** (0.087)	No
Humanities	-0.347*** (0.065)	-0.304*** (0.087)	-0.387*** (0.076)	No
Biological Chemistry	0.184** (0.081)	0.228** (0.099)	-0.039 (0.070)	Yes**
Mathematics	-0.279*** (0.067)	-0.239*** (0.087)	-0.325*** (0.097)	No
Medicine	0.221** (0.110)	0.233* (0.134)	0.166 (0.155)	No
Nursing	0.067 (0.093)	-0.058 (0.288)	0.043 (0.112)	No
Pharmacy	0.216** (0.099)	0.206* (0.116)	0.104 (0.181)	No
Physical Sciences	-0.088 (0.076)	-0.055 (0.091)	-0.117 (0.073)	No
Plant Sciences	0.093 (0.064)	0.176** (0.082)	-0.051 (0.089)	Yes*
Policy	-0.344*** (0.065)	-0.294*** (0.088)	-0.405*** (0.077)	No
Psychology	-0.229*** (0.068)	-0.268*** (0.096)	-0.238*** (0.087)	No

Tenure-track results continued

Table 5: OLS Regression Results for Tenure-Track Faculty

Dependent variable: log salary

Variables	Full	Male	Female	Significant Differences
Biological Sciences	-0.143** (0.067)	-0.090 (0.086)	-0.211** (0.096)	No
Economic Sciences	0.141** (0.068)	0.179** (0.089)	0.125 (0.097)	No
Food Sciences	0.151* (0.085)	0.167 (0.119)	0.146* (0.084)	No
Sch of the Environment	-0.167** (0.069)	-0.191** (0.088)	-0.125 (0.088)	No
Sociology	-0.245*** (0.064)	-0.180** (0.087)	-0.322*** (0.072)	No
Veterinary Medicine	0.196*** (0.061)	0.226*** (0.081)	0.176** (0.075)	No
Constant	11.454*** (0.059)	11.413*** (0.078)	11.485*** (0.068)	-
Observations	968	613	355	
R-square	0.739	0.756	0.715	

Recommendations

Long-term practices

- A standing advisory committee should be established with representatives from CSW, AFW, Faculty Senate, APAC, and new commission on DEI in partnership with CCR, HRS, IR, Provost's Office, and the President's Office.
- Biannual study should be conducted by WSU Institutional Research with guidance from advisory committee following best practices/model developed during this analysis.
- College-level reports should be provided to Deans and Department Chairs to aid in decisions around salary and to provide explanations for outliers.

Immediate interventions

- Review practices that are potentially introducing inequity:
 - Senior hires
 - Early tenure
 - Retention raises
 - Initial salaries
 - Administrative salaries/compensation.

Limitations

- Summary statistics show that women are hired and promoted at lower rates than men.
 - Including explanatory variables that may in themselves be biased against women means that our estimation results of salary gender bias are likely understated;
 - When rank is omitted from the regression equation, we estimate that female faculty in tenure-track earn almost 7 percent less than their male counterparts.
- The findings and conclusions in this study are based on a statistical analysis of aggregate data.
 - Nothing in this report is based upon, or intended to be understood as, a statement or interpretation of law.
 - Nothing in this report is based upon, or intended to be understood as, a determination or finding under any university policies.
 - Individual concerns about pay equity require a more detailed review of the specific pay affecting factors that are present based on the context of that individual's employment.
 - This factors-based analysis may include some, but not necessarily all, of the following non-exhaustive list: performance measures, productivity measures, job duties/responsibilities, relevant work experience, education, industry/job specific factors, and department specific factors, all of which were outside the scope of this study.

Additional Analyses & Next Steps

- Analyses of faculty salaries by college and campus are presented in the full report.
- We have started the staff analysis. Owing to the wide variety of positions, this analysis will be more complicated.

Thank you for your
attention.