# 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	\$73,996
•	,	(56031)	(40983)
Experience at WSU	Years employed at WSU	6.97	7.35
	1 7	(6.84)	(6.73)
Director	1 if Director,	2.64%	3.02%
	0 otherwise	(9/341)	(12/397)
Exec. Admin	1 if Dean or Above,		
	0 otherwise	ND	ND
Administration	1 if in Administration,	2.35%	2.02%
	0 otherwise	(8/341)	(8/397)
Assistant Research Professor	1 if Assistant Research	6.16%	5.54%
	Prof., 0 otherwise	(21/341)	(22/397)
Associate Research Professor	1 if Assoc. Research		
	Prof., 0 otherwise	ND	ND
Clinical Assistant Professor	1 if Clinical Assist.	22.29%	24.43%
	Prof., 0 otherwise	(76/341)	(97/397)
Clinical Associate Professor	1 if Clinical Associate	16.13%	15.37%
	Prof., 0 otherwise	(55/341)	(61/397)
Clinical Professor	1 if Clinical Professor,	6.45%	4.03%
	0 otherwise	(22/341)	(16/397)
Instructor	1 if Instructor,	19.65%	28.97%
	0 otherwise	(67/341)	(115/397)
Research Associate	1 if Research Assoc.,	11.44%	7.56%
	0 otherwise	(39/341)	(30/397)
Research Professor	1 if Research Prof.,	1.76%	
	0 otherwise	(6/341)	ND
Senior Instructor	1 if Senior Instructor,	2.93%	6.55%
	0 otherwise	(10/341)	(26/397)
Staff Scientist	1 if Staff Scientist,	3.52%	
	0 otherwise	(12/341)	ND
Asian American	1 if Asian Amer.	4.99%	6.55%
	0 otherwise	(17/341)	(26/397)
African American	1 if African Amer.	1.47%	1.26%
	0 otherwise	(5/341)	(5/397)
Decline to State	1 if decline to state		
	ethnicity,	35.19%	22.42%
	0 otherwise	(120/341)	(89/397)
Hispanic	1 if Hispanic	4.69%	5.29%
	0 otherwise	(16/341)	(21/397)
Other	1 if other ethnicity		
	0 otherwise	ND	ND
White	1 if Caucasian	53.08%	63.48%
	0 otherwise	(181/341)	(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)

	***	D 1.1	7.7.1		
_	Variable Name	Description	Male	Female	
	Salary	Yearly salary	\$128,968	\$106,929	
	Daiary	rearry sarary	(64536)	(47044)	
	Experience	Years since final degree	21.06	16.84	
	Experience	rears since iniai degree	(11.05)	(10.13)	
	Experience at WSU	Years of employment at	14.51	12.15	
_	Experience at w50	WSU	(10.59)	(9.57)	
	Early Toman	1 if earned tenure in less than	23.82%	10.20%	
l	Early Tenure	6 years, 0 otherwise	(146/613)	(36/353)	
	Director	1 if Director,	3.10%	2.27%	
	Director	0 otherwise	(19/613)	(8/353)	
	Clasia	1 if department chair,	2.12%	2.27%	
	Chair	0 otherwise	(13/613)	(8/353)	
	E 41 .	1 if Dean or above,	2.61%	2.27%	
	Exec. Admin	0 otherwise	(16/613)	(8/353)	
	A D . C	1 if Assistant Prof.	17.78%	28.61%	
	Assistant Professor	0 otherwise	(109/613)	(101/353)	
	A D . C	1 if Assoc. Prof.	34.26%	37.68%	
	Associate Professor	0 otherwise	(210/613)	(133/353)	
- (	Professor	1 if Full Prof.	43.56%	30.88%	
	Professor	0 otherwise	(267/613)	(109/353)	
D D £	1 if Regents Prof.	3.26%	1.13%		
l	Regents' Professor	0 otherwise	(20/613)	(4/353)	
Ì	Asian American	1 if Asian Amer.	14.03%	7.93%	
	Asian American	0 otherwise	(86/613)	(28/353)	
	African American	1 if African Amer.	0.98%		
	Affican American	0 otherwise	(6/613)	ND	
	Decline to State	1 if decline to state ethnicity,	30.51%	24.36%	
	Decline to State	0 otherwise	(187/613)	(86/353)	
	Titalia	1 if Hispanic	2.28%	3.97%	
	Hispanic	0 otherwise	(14/613)	(14/353)	
	Orlean	1 if other ethnicity	1.96%	2.55%	
	Other	0 otherwise	(12/613)	(9/353)	
	W71 ·	1 if Caucasian	50.24%	60.62%	
	White	0 otherwise	(308/613)	(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.

$$\ln(salary) = \beta_0 + \beta_{1female} + \beta_2 x_2 + \dots + \beta_{nx_n} + \varepsilon$$

- Where  $\beta_1$  is the coefficient of interest, which indicates female,  $x_2$  to  $x_n$  are explanatory variables, and  $\varepsilon$  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 Difference
Female	-0.064***	-	-	-
Temate	(0.019)			
Experience at WSU	-0.000	0.001	-0.001	No
Emperience at wee	(0.001)	(0.002)	(0.002)	
Director	0.252***	0.212**	0.430***	No
Bilector	(0.085)	(0.091)	(0.149)	
Exec. admin	0.930***	0.850***	1.078***	No
Exec. admini	(0.172)	(0.271)	(0.151)	
Rank (Asst. Res. Prof.)				
Administration	0.542***	0.772***	0.166	Yes**
7 Chimistration	(0.123)	(0.139)	(0.191)	
Associate Research	0.174**	0.138*	0.290	Yes***
Professor	(0.069)	(0.079)	(0.180)	
Clinical Assistant	0.178***	0.128*	0.243***	Yes***
Professor	(0.045)	(0.067)	(0.069)	
Clinical Associate	0.340***	0.334***	0.342***	Yes***
Professor	(0.047)	(0.070)	(0.070)	
	0.628***	0.564***	0.706***	Yes***
Clinical Professor	(0.059)	(0.081)	(0.090)	
Extension Director	0.267**	0.378**	0.220*	No
Extension Director	(0.110)	(0.181)	(0.120)	
Extension Regional	0.023	0.114	-0.058	No
Specialist	(0.097)	(0.154)	(0.113)	
To at marks in	-0.060	-0.044	-0.039	Yes***
Instructor	(0.048)	(0.070)	(0.073)	
D 1 A	-0.248***	-0.229***	-0.252***	Yes**
Research Associate	(0.052)	(0.071)	(0.078)	
D 1 D C	0.711***	0.713***	0.666***	Yes**
Research Professor	(0.116)	(0.150)	(0.100)	
C . I	-0.010	-0.094	0.064	Yes***
Senior Instructor	(0.057)	(0.096)	(0.081)	
0. 660	-0.031	-0.034	-0.019	Yes**
Staff Scientist	(0.094)	(0.102)	(0.103)	

• 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	
Location (Pullman)	
Other	(
Spokane	
Tri-Cities	
Vancouver	
Ethnicity (White)	
Asian American	
African American	
Decline to State	
Hispanic	
Other	

Full	Male	Female	Significant Differences
0.099***	0.125**	0.060	No
(0.035)	(0.051)	(0.047)	
0.083*	0.105	0.107**	No
(0.044)	(0.082)	(0.053)	
0.011	0.014	0.015	No
(0.034)	(0.048)	(0.051)	
0.059**	0.045	0.060*	No
(0.030)	(0.052)	(0.032)	
0.029	0.023	0.055	No
(0.044)	(0.068)	(0.060)	
0.156*	0.286**	0.091	No
(0.084)	(0.133)	(0.057)	
-0.013	-0.030	0.008	No
(0.020)	(0.027)	(0.033)	
0.072**	-0.023	0.100**	No
(0.036)	(0.075)	(0.039)	
-0.104	-0.331**	0.015	Yes**
(0.098)	(0.131)	(0.110)	

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***	-0.435**	-0.589***	No
Alts	(0.107)	(0.177)	(0.136)	
Biomedical Sciences	0.016	0.071	-0.004	No
	(0.111)	(0.192)	(0.141)	
Business	0.070	0.182	0.057	No
Dusiness	(0.110)	(0.180)	(0.153)	
Chemistry	-0.376***	-0.226	-0.579***	No
Chemistry	(0.105)	(0.175)	(0.141)	
Communication	-0.138	0.060	-0.342**	Yes*
Communication	(0.106)	(0.182)	(0.136)	
Education	-0.330***	-0.309*	-0.423***	No
Laucation	(0.106)	(0.183)	(0.137)	
Engineering	-0.020	0.101	-0.236*	No
Lingineering	(0.103)	(0.178)	(0.142)	
Entomology	0.213**	0.293	0.139	No
Littomology	(0.100)	(0.187)	(0.114)	
Extension	-0.077	-0.083	-0.095	No
Extension	(0.124)	(0.210)	(0.141)	
Human Davidonment	-0.283**	-0.077	-0.407***	No
Human Development	(0.117)	(0.271)	(0.142)	
Humanities	-0.476***	-0.409**	-0.573***	No
Tumanues	(0.103)	(0.176)	(0.134)	
Biological Chemistry	-0.072	-0.065	-0.114	No
olological Chemistry	(0.116)	(0.182)	(0.152)	
Intermeticant Duccusans	-0.380***	-0.489**	-0.413***	No
International Programs	(0.123)	(0.200)	(0.153)	
Mathematics	-0.256**	-0.175	-0.354**	No
watnematics	(0.110)	(0.182)	(0.148)	
Medicine	0.274**	0.484**	0.028	Yes*
Medicine	(0.115)	(0.196)	(0.150)	
Numaina	-0.192*	0.369*	-0.346**	Yes***
Nursing	(0.112)	(0.203)	(0.143)	
D1	0.067	0.048	0.017	No
Pharmacy	(0.108)	(0.194)	(0.137)	
D1 1 A	0.128	0.238	-0.422***	Yes***
Physics and Astronomy	(0.129)	(0.193)	(0.145)	
Plant Sciences	-0.035	0.077	-0.136	No
riant ociences	(0.112)	(0.179)	(0.145)	
Dollar	-0.369***	-0.296	-0.494**	No
Policy	(0.131)	(0.197)	(0.204)	
Davide alla av	-0.245**	-0.093	-0.383***	No
Psychology	(0.110)	(0.178)	(0.137)	

#### 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*	-0.061	-0.395***	No
Biological Sciences	(0.112)	(0.194)	(0.141)	
Economic Sciences	-0.089	0.018	-0.205	No
Economic Sciences	(0.122)	(0.193)	(0.204)	
Sch of the Environment	-0.132	0.024	-0.290**	No
Sch of the Environment	(0.109)	(0.179)	(0.140)	
Sociology	0.289	0.497***	0.232	No
Sociology	(0.182)	(0.176)	(0.210)	
Veterinary Medicine	0.172	0.279	0.056	No
vetermary medicine	(0.105)	(0.183)	(0.134)	
Constant	11.677***	11.817***	11.326***	-
Constant	(0.155)	(0.212)	(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***	-0.008***	-0.005***	
Experience at wide	(0.001)	(0.001)	(0.002)	No
Director	0.277***	0.274***	0.282***	
Birector	(0.049)	(0.055)	(0.104)	No
Chair	0.374***	0.320***	0.400***	
Citati	(0.057)	(0.073)	(0.091)	No
Exec. admin	0.723***	0.816***	0.587***	
Lacc. admin	(0.076)	(0.081)	(0.124)	No
Rank (Assistant Professor)				
Associate Professor	0.173***	0.194***	0.140***	
Associate Floressor	(0.018)	(0.023)	(0.031)	No
Extension E-2	0.031	0.283***	0.012	
Laterision L 2	(0.066)	(0.094)	(0.057)	Yes**
Extension E-3	0.129**	0.124*		
Laterision L-5	(0.059)	(0.065)	-	No
Extension E-4	0.403**	0.443	0.427*	
Laterision L-4	(0.172)	(0.279)	(0.258)	No
Professor	0.502***	0.529***	0.453***	
1 10163301	(0.025)	(0.030)	(0.052)	No
Regents' Professor	0.947***	1.023***	0.652**	
Regents 1 101essor	(0.083)	(0.080)	(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	-0.037	0.031	
Other	(0.039)	(0.050)	(0.060)	No
Spokane	-0.056	0.010	-0.119	
броканс	(0.075)	(0.084)	(0.112)	No
Tri-Cities	-0.008	-0.015	-0.025	
Tii-Ciues	(0.036)	(0.052)	(0.055)	No
Vancouver	-0.055***	-0.055*	-0.051	
vancouver	(0.021)	(0.029)	(0.032)	No
Ethnicity (White)				
Asian American	-0.011	-0.016	-0.028	
1 totali 1 tiliciicali	(0.024)	(0.029)	(0.046)	No
African American	-0.050	-0.062	-0.104	
111100011111101100011	(0.068)	(0.049)	(0.248)	No
Decline to State	0.003	-0.016	0.024	
Decime to state	(0.017)	(0.023)	(0.030)	No
Hispanic	0.065	0.011	0.102	
P	(0.042)	(0.053)	(0.067)	No
Other	0.035	0.055	0.058	
Other	(0.059)	(0.088)	(0.070)	No

Table 5: OLS Regression Results for Tenure-Track Faculty
Dependent variable: log salary

Dependent variable: log salar	У			
Variables	Full	Male	Female	Significant Differences
Unit (Animal Sci.)				
Anthropology	-0.431***	-0.439***	-0.455***	
7 intili opology	(0.066)	(0.081)	(0.092)	No
Apparel Merch Design &	-0.187***	-0.148*	-0.257***	
Textile	(0.060)	(0.080)	(0.076)	No
Arts	-0.469***	-0.429***	-0.524***	
	(0.064)	(0.084)	(0.091)	No
Biological System	0.235***	0.315***	0.029	
Engineering	(0.081)	(0.098)	(0.150)	No
Business	0.345***	0.381***	0.308***	
	(0.067)	(0.086)	(0.092)	No
Chemistry	-0.084	-0.052	-0.024	
Sileimotry	(0.065)	(0.083)	(0.133)	No
Communication	-0.133*	0.012	-0.213***	
Communication	(0.072)	(0.161)	(0.080)	No
Education	-0.234***	-0.210***	-0.282***	
Eddeadon	(0.061)	(0.081)	(0.075)	No
Engineering	0.039	0.083	0.004	
Engineering	(0.061)	(0.079)	(0.084)	No
Entomology	0.146	0.279**	-0.273***	
Entomology	(0.101)	(0.116)	(0.090)	Yes***
Extension	-0.232***	-0.140	-0.360***	
Extension	(0.066)	(0.085)	(0.087)	Yes**
Human Development	-0.210***	-0.265***	-0.244***	
Tuman Development	(0.072)	(0.095)	(0.087)	No
Humanities	-0.347***	-0.304***	-0.387***	
Tumanides	(0.065)	(0.087)	(0.076)	No
Biological Chemistry	0.184**	0.228**	-0.039	
Diological Chemistry	(0.081)	(0.099)	(0.070)	Yes**
Mathematics	-0.279***	-0.239***	-0.325***	
Mathematics	(0.067)	(0.087)	(0.097)	No
Medicine	0.221**	0.233*	0.166	
Wiedienie	(0.110)	(0.134)	(0.155)	No
Nursing	0.067	-0.058	0.043	
Tursing	(0.093)	(0.288)	(0.112)	No
Pharmacy	0.216**	0.206*	0.104	
Паттасу	(0.099)	(0.116)	(0.181)	No
Diii C-i	-0.088	-0.055	-0.117	
Physical Sciences	(0.076)	(0.091)	(0.073)	No
Plant Sciences	0.093	0.176**	-0.051	
Flaint Sciences	(0.064)	(0.082)	(0.089)	Yes*
Dollar	-0.344***	-0.294***	-0.405***	
Policy	(0.065)	(0.088)	(0.077)	No
Developer	-0.229***	-0.268***	-0.238***	
Psychology	(0.068)	(0.096)	(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
Di-1i1 C-i	-0.143**	-0.090	-0.211**	
Biological Sciences	(0.067)	(0.086)	(0.096)	No
Economic Sciences	0.141**	0.179**	0.125	
Economic Sciences	(0.068)	(0.089)	(0.097)	No
Food Sciences	0.151*	0.167	0.146*	
1 Tood Sciences	(0.085)	(0.119)	(0.084)	No
Sch of the Environment	-0.167**	-0.191**	-0.125	
Sch of the Environment	(0.069)	(0.088)	(0.088)	No
Sociology	-0.245***	-0.180**	-0.322***	
Sociology	(0.064)	(0.087)	(0.072)	No
Veterinary Medicine	0.196***	0.226***	0.176**	
veterinary wedienie	(0.061)	(0.081)	(0.075)	No
Constant	11.454***	11.413***	11.485***	
Constant	(0.059)	(0.078)	(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.