

Overview

A joint Administration-Academic Senate Committee redesigned our annual campus pay equity study of ladder rank faculty salaries. The committee included:

- Diane O'Dowd (Chair), Vice Provost, Academic Personnel
- Nina Bandelj, Associate Vice Provost for Faculty Development
- Ryan Cherland, Assistant Vice Chancellor, Institutional Research & Decision Support
- Jean Chin, Director, Academic Personnel
- Teresa Dalton, Lecturer SOE, Criminology, Law and Society
- Jennifer Luong, Principal Compensation Analyst, Academic Personnel
- Jone Pearce, Dean's Professor of Organization and Management, Paul Merage School of Business
- Preston Reed, Principal Research Analyst, Institutional Research
- Jessica Utts, Professor, Statistics
- Yaming Yu, Professor, Statistics

The analyses presented in this report focus on regression models that go beyond the annual residual analysis conducted in the past (1997-2014) and include evaluation of rate of progression through the ranks. Data were examined at the whole campus level, and for 14 Schools/Units. SOM faculty continue to be excluded from this study due to the differences in compensation associated with participation in the COMP plan. For the first time in 2020, Professors of Teaching are included in the analyses with other ladder rank faculty. This occurred after the 2019 transition of Lecturers with Security of Employment to stepped Professors of Teaching titles. For analytical purposes, they are treated the same as other ladder rank faculty.

Analysis of salary data from October 2019 indicated no evidence of systemic disparity in pay associated with gender and/or ethnicity at the campus level when experience, discipline, and rank are included in the model. However, there is further work to do to understand the issues around the 1) low percentage of women and minority faculty at the higher ranks and steps across campus, and 2) differences in the rate of progression through the ranks and salary disparities by gender/ethnicity in some units.

Methodology

Multiple linear regression model: A series of regressions were used to examine potential correlations between gender/ethnicity variables and salary. This approach provided a broad view of faculty employment and pay structure by demographic variables and by experience, discipline, and rank.

- Demographic factors entered the equation as indicator variables for Women, Asian, and Underrepresented Minorities (URM).
- Experience variables include Years Since Degree, Years of Service, and Decade of Hire. Years Since Degree is the number of years passed from the year the highest degree was earned to the present. Years of Service is the number of years passed since the individual became a Ladder Rank faculty member. Decade of Hire consists of four binary

categorical variables to account for the decade the individual became senate faculty: 2010 to 2019, 2000 to 2009, 1990 to 1999, or prior to 1989.

- Discipline is accounted for by adding an indicator variable for each school. The discipline variable accounts for internal demand and a market ratio derived using AAUDE salary data for UCI's peer institutions is used to account for external demand by field.
- Rank includes Current Rank and Step, Initial Rank and Step at time of hire, and Progress Rate.

Progress Rate measures number of years the faculty member is ahead or behind normal progression through the ranks. Normative time to achieve each rank is determined by computing the number of years it would take to move from the initial rank to the current rank and step, if the individual is progressing at the university's established normal rate. If an individual was promoted to their specific rank/step in the normative time, then rate of progression is 0. If they took longer than normative time, rate of progression is expressed as a negative number (years). If they took less than normative time then rate of progression is expressed as a positive number (years). The appendix shows normative time table and sample calculations.

In order to evaluate whether biases exist within progression through the ranks, several box and scatter plots by gender, ethnicity, rank, and school were generated to visualize and investigate the data. Progression rate differences by demographic groups were also tested with t-tests. Finally, a series of regression models were run to quantify progression rate differences that may exist by gender or ethnicity.

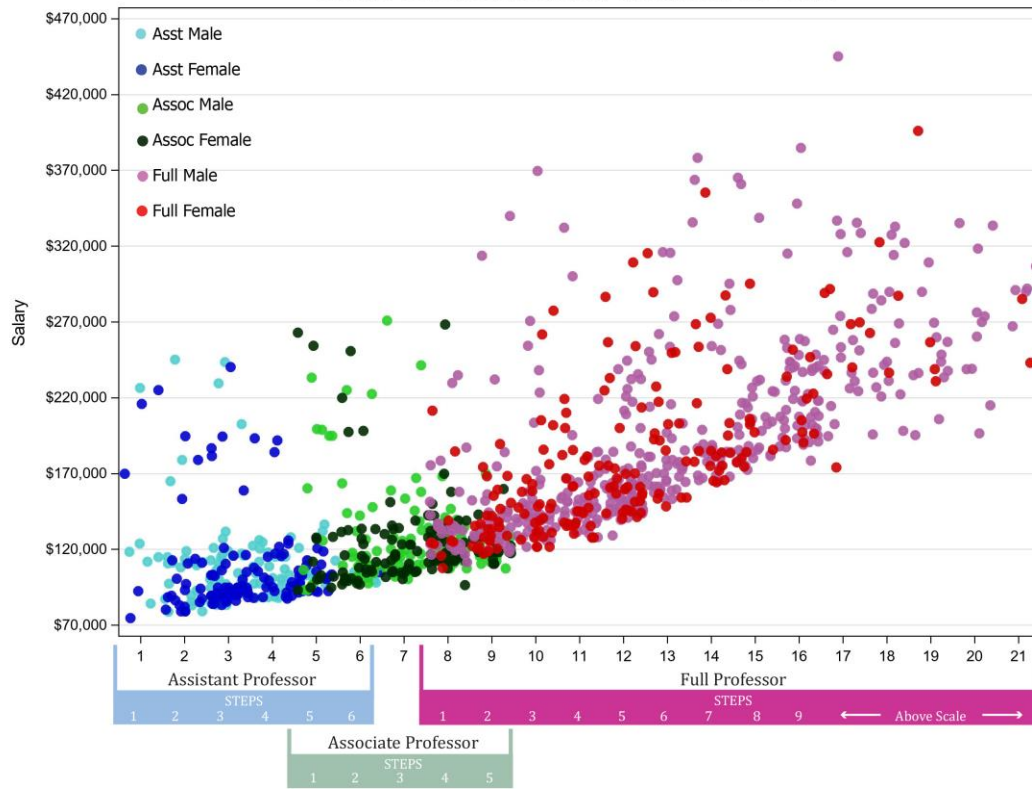
There is a possibility that one or more of the explanatory factors in the salary regression models are correlated; we therefore evaluated the effect of multicollinearity in our models. There was evidence of multicollinearity, therefore, data are presented with and without removal of variables with variance inflation factors (VIF) ≥ 10 . In the interest of consistency over time, except in rare circumstances of high levels of collinearity (VIF > 20), variables retained in the final model corrected for collinearity are the same as the previous year.

Results for Salary Data (October 2019)

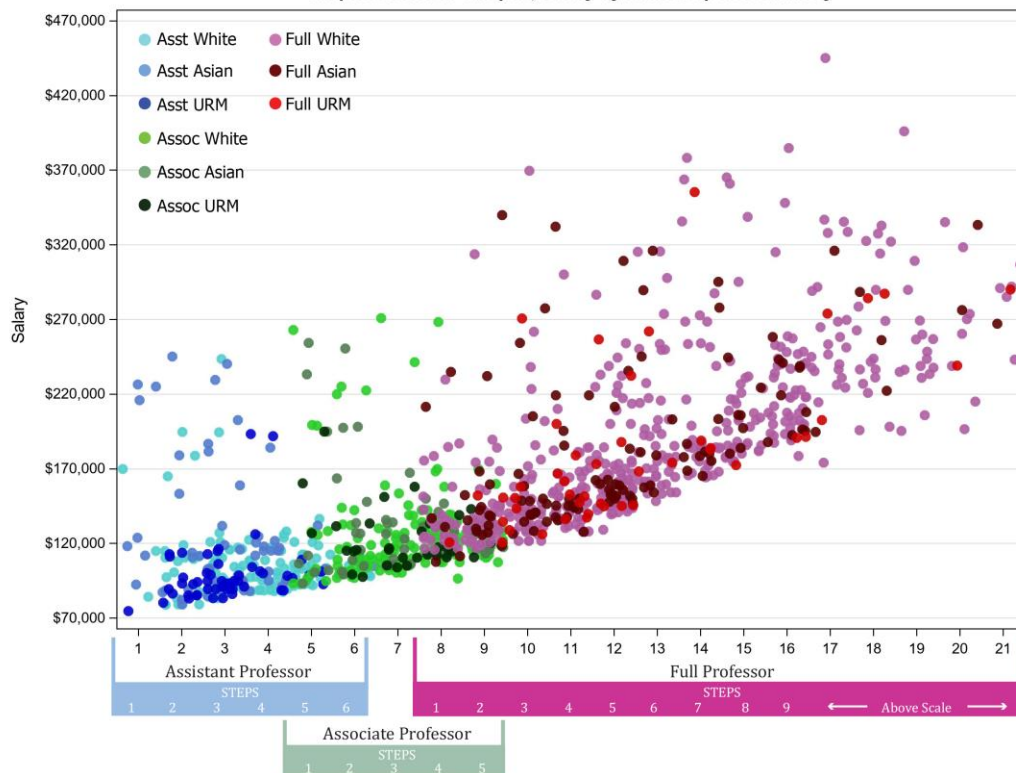
Campus level

1. Salary data for all ladder rank faculty plotted as a function of rank/step/gender and rank/step/ethnicity are illustrated in Graphs 1 and 2.

Graph 1: General Campus, Salary by Rank/Step and Gender



Graph 2: General Campus, Salary by Rank/Step and Ethnicity



2. Multiple linear regression analysis: When these data are evaluated with the simplest model that includes only demographic variables the result indicate that, compared to their colleagues who are male, women earn salaries that are 12% lower, Asian faculty 1.8% lower, and URM faculty 15.% lower. However, only 6% of the salary variation is explained by the model (Table 1). As additional explanatory variables are added to the model, salary differences diminish to approximately 1% or less between women, Asian, and URM faculty when compared to white men; and the percentage of salary variation explained by the model increases to 91%. This indicates that at the campus level, there is little evidence of salary inequity associated with gender and/or ethnicity.

Table 1.

Submodel ¹	R-sq	Significant Variables	Salary Difference		
			Women vs Men	Asian vs White	URM vs White
1 Demography	0.06	Women***, URM***	-12.0%	-1.8%	-15.0%
2 Demography, Experience	0.41	Women***, Asian*, URM**, Experience***	-5.9%	4.7%	-6.9%
3 Demog, Exper, Field	0.71	Women***, URM*, Experience***, Field***	-4.2%	-1.0%	-4.4%
4 Demog, Exper, Field, Rank	0.91	Experience*, Field***, Rank***	-1.2%	1.2%	0.5%
5 Demog, Exper, Field, Rank ²	0.91	Field***, Rank***	-1.1%	1.2%	0.4%

*p<0.05, **p<0.01, ***p<0.001

¹Experience includes years of service, years since degree, and decade of hire. Field includes school and the market ratio of salaries tied to the faculty member's department. Rank includes their starting rank at UCI, their current rank at UCI, and where they stand in relation to normal progress.

²Final model corrected for collinearity and included demographics, decade of hire, years since degree, school***, market salary ratio***, progress***, current rank***, and initial rank***.

3. Rank/Step Distribution Analysis: The distribution of faculty among ranks both currently and at time of hire is displayed in Table 2 and Table 3. The tables, along with the graphs of data illustrate that, whereas women make up roughly an even number of those starting in the level of junior faculty, more of those who were hired at the highest level were men. Further, white men made up a growing percentage of those hired at the middle and senior levels of faculty relative to Asian and URM faculty.

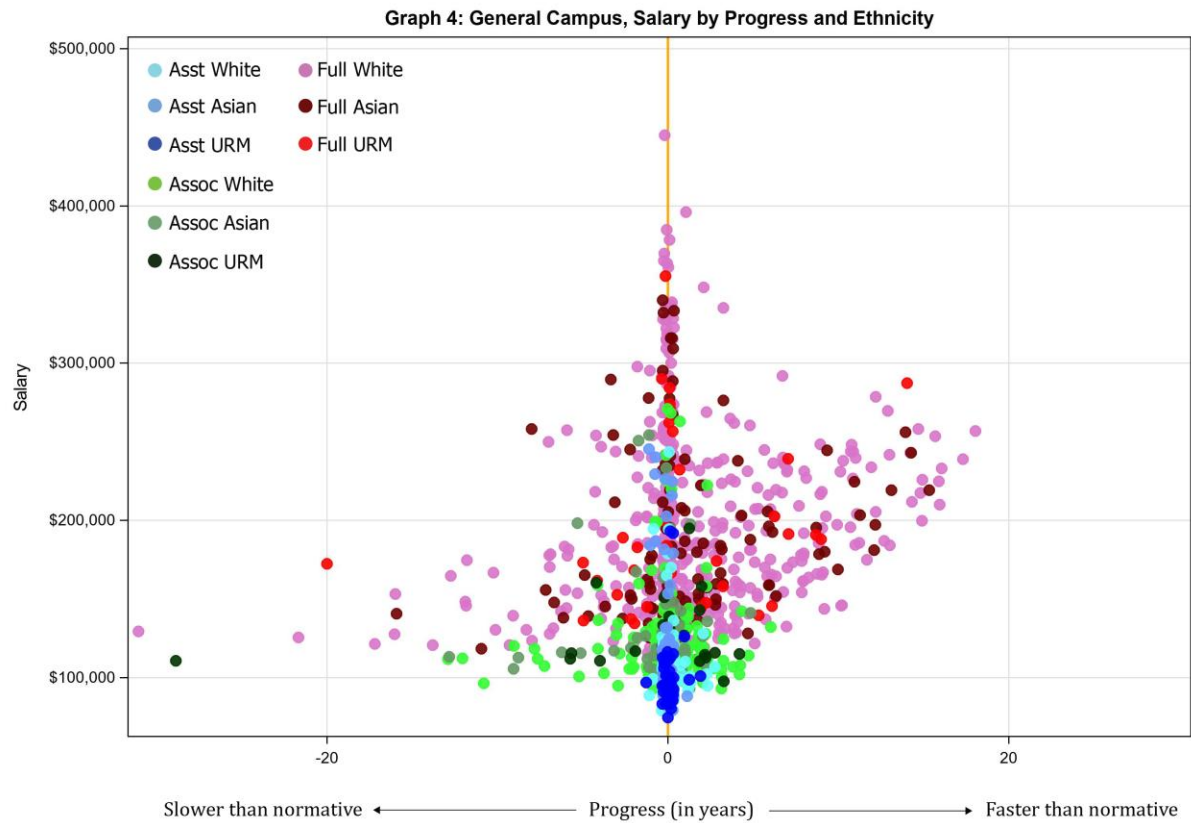
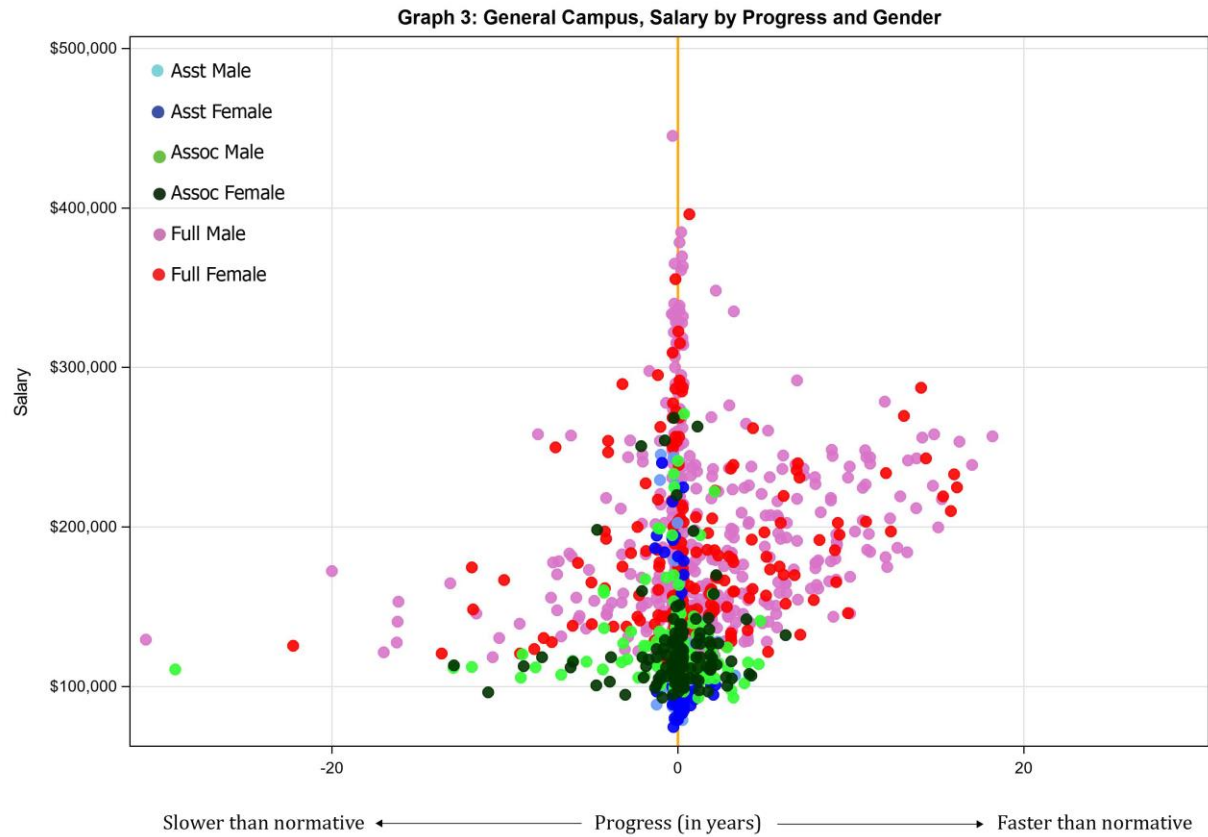
Table 2. White men vs. Women faculty

All Faculty		Current Salary				CPI Initial Salary			
		N	%	Mean	StdErr	N	%	Mean	StdErr
I. Asst Prof, all Steps	White/Unk Men	68	35%	\$105,500	\$2,710	332	49%	\$87,625	\$1,228
	Women	126	65%	\$107,694	\$2,870	341	51%	\$89,085	\$1,529
II. Assoc Prof, all Steps	White/Unk Men	92	40%	\$127,696	\$3,204	57	50%	\$109,286	\$3,711
	Women	140	60%	\$123,829	\$2,532	57	50%	\$111,766	\$4,105
III. Full Prof, Steps 1-5	White/Unk Men	170	58%	\$155,410	\$2,706	68	57%	\$151,995	\$6,228
	Women	125	42%	\$157,761	\$3,272	52	43%	\$143,000	\$5,703
IV. Full Prof, Steps 6-9 and Above Scale	White/Unk Men	176	70%	\$231,265	\$4,157	47	73%	\$228,239	\$7,746
	Women	76	30%	\$220,592	\$5,769	17	27%	\$221,350	\$13,460

Table 3. White men vs. Asian and URM faculty

All Faculty		Current Salary				CPI Initial Salary			
		N	%	Mean	StdErr	N	%	Mean	StdErr
I. Asst Prof, all Steps	White/Unk Men	68	38%	\$105,500	\$2,710	332	54%	\$87,625	\$1,228
	Asian	58	32%	\$126,260	\$5,937	182	29%	\$97,199	\$2,518
	URM	53	30%	\$99,723	\$2,929	104	17%	\$86,852	\$1,849
II. Assoc Prof, all Steps	White/Unk Men	92	49%	\$127,696	\$3,204	57	61%	\$109,286	\$3,711
	Asian	62	33%	\$130,108	\$4,383	25	27%	\$122,414	\$8,162
	URM	32	17%	\$123,597	\$3,631	11	12%	\$109,752	\$6,189
III. Full Prof, Steps 1-5	White/Unk Men	169	62%	\$154,940	\$2,681	68	67%	\$151,995	\$6,228
	Asian	74	27%	\$164,268	\$5,526	24	24%	\$153,311	\$11,177
	URM	29	11%	\$160,745	\$6,910	10	10%	\$165,471	\$11,790
IV. Full Prof, Steps 6-9 and Above Scale	White/Unk Men	175	74%	\$230,781	\$4,153	47	77%	\$228,239	\$7,746
	Asian	46	19%	\$219,357	\$6,935	9	15%	\$228,734	\$16,486
	URM	16	7%	\$227,975	\$14,223	5	8%	\$227,935	\$28,035

Progress Rate Graphs: By Gender and Ethnicity



5. **Progress Rate Analysis:** There has been debate on whether rank should be included in predicting salary. In previous studies, rank is generally included in predictive modeling unless there is evidence of bias against one group progressing through the ranks. Cursory *t*-tests on the rate of progression indicate there is no statistically significant difference in progression rate means by Asian and White male faculty. However, women faculty on average advanced at a rate that was 0.67 years and URM faculty 1.05 years slower than White men. After using multivariate regression to adjust for experience, discipline, and initial rank, there was no statistically significant difference in rates of progression between White and Asian faculty. Women progressed at a statistically significant slower rate than men ($b = -0.51$, $p = 0.039$), and URM faculty progressed at a statistically significant slower rate than White faculty ($b = -0.87$, $p = 0.021$).

This is the first year with statistically significant differences in rates of progress between White male faculty and other demographic groups. As this is the first year we are including Professors of Teaching, we ran analyses both with and without Professors of Teaching. When the Professors of Teaching were excluded, difference between White males and other demographic groups were not statistically significant. However, the average magnitude of differences was roughly the same, suggesting that the lack of statistical significance was likely due to the decreased sample size not the addition of the Professors of Teaching.

For the sake of consistency in comparing results year over year, finalized salary regression models will maintain the same variables as previous years (which includes current rank and step for most schools) while we further explore the reasons behind these differences and possible mitigating steps if appropriate.

Table 2. Progress Rate (in years) Comparison

Comparison	n	Mean	t	df	p-value
White Male vs	504	1.06			
Women ^a	467	0.39	-2.59	945	0.010
URM	130	0.01	-2.44	634	0.015
Asian ^a	240	0.46	-1.93	555	0.055

^aHomogeneity of variance assumption not met. Satterthwaite variance estimator used.

Note. Multivariate regression was conducted estimating rates of progression adjusting for experience, discipline, and initial rank. These analyses suggested women and URM faculty progress at rates that are significantly slower than white male faculty.

School Level

Analyses at the school level yield a range of results. When controlling for experience, department within the school, and rank, salary differences are, for the most part, similar to that of the campus as a whole, but there are exceptions. Some units show statistically significant

higher salaries for minority groups relative to white faculty, whereas other units show no statistically significant differences between ethnicities or genders. One school does show a statistically significant lower salary for women relative to men that is being studied further. Known limitations to the current analysis are that data on “Stop the Clock” are not readily available nor was there enough data to consistently address the impact of outside offers.

Summary

In summary, we found no evidence for systemic inequity in salary associated with gender and/or ethnicity among faculty at the campus level. However this study does highlight several areas for further evaluation including understanding factors contributing to low representation of women and minority faculty in the higher ranks and steps. The study showed that women and URM faculty progressed through the ranks at somewhat slower rates than White male faculty. Further analysis is needed to examine potential explanations of these trends and appropriate remediation.

Appendix

PROGRESSION THROUGH THE RANKS

Normal time (in years) it takes to achieve rank/step

STARTING RANK/STEP	ENDING RANK/STEP																			
	Asst2	Asst3	Asst4	Asst5	Asst6	Assoc1	Assoc2	Assoc3	Assoc4	Assoc5	Prof1	Prof2	Prof3	Prof4	Prof5	Prof6	Prof7	Prof8	Prof9	ProfAS
Asst1	2	4	--	--	--	6	8	10	--	--	12	15	18	21	24	27	30	33	36	40
Asst2	--	2	4	--	--	6	8	10	--	--	12	15	18	21	24	27	30	33	36	40
Asst3	--	--	2	4	--	--	6	8	10	--	--	13	16	19	22	25	28	31	34	38
Asst4	--	--	--	2	4	--	--	6	8	11	--	--	14	17	20	23	26	29	32	36
Asst5 *	--	--	--	--	--	--	2	4	6	--	--	9	12	15	18	21	24	27	30	33
Asst6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Assoc1	--	--	--	--	--	--	2	4	--	--	6	9	12	15	18	21	24	27	30	34
Assoc2	--	--	--	--	--	--	--	2	4	--	--	7	10	13	16	19	22	25	28	32
Assoc3	--	--	--	--	--	--	--	--	2	5	--	--	8	11	14	17	20	23	26	30
Assoc4	--	--	--	--	--	--	--	--	--	3	--	--	6	9	12	15	18	21	24	28
Assoc5	--	--	--	--	--	--	--	--	--	--	--	--	3	6	9	12	15	18	21	25
Prof1	--	--	--	--	--	--	--	--	--	--	--	3	6	9	12	15	18	21	24	28
Prof2	--	--	--	--	--	--	--	--	--	--	--	--	3	6	9	12	15	18	21	25
Prof3	--	--	--	--	--	--	--	--	--	--	--	--	--	3	6	9	12	15	18	22
Prof4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	6	9	12	15	19
Prof5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	6	9	12	16
Prof6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	6	9	13
Prof7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	6	10
Prof8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	7
Prof9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4
ProfAS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

EXAMPLES:

Professor A: Normal Progression

Initial Rank/Step: Assistant Professor III
Current Rank/Step: Professor VI
Years of Service: 25 years
Expected time to get from Asst III to Prof VI: 25 years
Progress Rate: 0 (Normal Progression)

Professor B: Accelerated Progression

Initial Rank/Step: Assistant Professor II
Current Rank/Step: Professor VIII
Years of Service: 26 years
Expected time to get from Asst II to Prof VIII: 33 years
Progress Rate: +7 (Accelerated Progression)

Professor C: Slower Progression

Initial Rank/Step: Assistant Professor I
Current Rank/Step: Associate Professor IV
Years of Service: 20 years
Expected time to get from Asst I to Assoc IV: 12 years*
Progress Rate: -5 (Accelerated Progression)

For Professor C, why is the progress rate not -8?

Because we have to correct for the 3 years that Prof C would have normally gotten to progress to the next step (it should not count against Prof C). Otherwise everyone who is between reviews and progressing normally will look like they are progressing slowly.

* It is not normative for someone who started at Asst I to end up as an Assoc IV. One would expect that this individual would have moved to Full Professor by now, which is why the matrix does not have a year attributed to that cross section. We obtained the expected time from Asst I to Assoc IV by adding 2 years (normal review cycle for Assoc III to Assoc IV) to the expected time from Asst I to Assoc III (10 years).