

Analysis of Faculty Compensation Fiscal Year 2013

May 9, 2013

Statistical Analysis

- ▶ Statistical analysis was based on a total of 946 individuals in tenure track positions ¹.

¹33 faculty were excluded that were in primarily administrative roles or who left the university during the year

Statistical Analysis

- ▶ Statistical analysis was based on a total of 946 individuals in tenure track positions ¹.
- ▶ Salaries are 9 month base pay (or equivalent for Basic Science or other Division/Departments with 12 month appointments or part-time faculty)

¹33 faculty were excluded that were in primarily administrative roles or who left the university during the year

Statistical Analysis

- ▶ Statistical analysis was based on a total of 946 individuals in tenure track positions ¹.
- ▶ Salaries are 9 month base pay (or equivalent for Basic Science or other Division/Departments with 12 month appointments or part-time faculty)
- ▶ Excludes supplementary pay (Department chairs, etc)

¹33 faculty were excluded that were in primarily administrative roles or who left the university during the year

Statistical Analysis

- ▶ Statistical analysis was based on a total of 946 individuals in tenure track positions ¹.
- ▶ Salaries are 9 month base pay (or equivalent for Basic Science or other Division/Departments with 12 month appointments or part-time faculty)
- ▶ Excludes supplementary pay (Department chairs, etc)
- ▶ Separate analyses for
 - ▶ Assistant Professors
 - ▶ Associate Professors
 - ▶ Full Professors

¹33 faculty were excluded that were in primarily administrative roles or who left the university during the year

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank
- ▶ Rank at Hire (new)

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank
- ▶ Rank at Hire (new)
- ▶ Department Chair Indicator (Full)
- ▶ Distinguished Professor Indicator (Full)

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank
- ▶ Rank at Hire (new)
- ▶ Department Chair Indicator (Full)
- ▶ Distinguished Professor Indicator (Full)
- ▶ Gender

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank
- ▶ Rank at Hire (new)
- ▶ Department Chair Indicator (Full)
- ▶ Distinguished Professor Indicator (Full)
- ▶ Gender
- ▶ Race - collapsed to Caucasian versus non-Caucasian (Asian, Black, Hispanic, or more than 2 races/ethnic groups)

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank
- ▶ Rank at Hire (new)
- ▶ Department Chair Indicator (Full)
- ▶ Distinguished Professor Indicator (Full)
- ▶ Gender
- ▶ Race - collapsed to Caucasian versus non-Caucasian (Asian, Black, Hispanic, or more than 2 races/ethnic groups)

Statistical Models

- ▶ Linear Regression using log transformation of Salary

Statistical Methodology

Variables used in explaining differences in Salary

- ▶ Department
- ▶ Time in Rank
- ▶ Rank at Hire (new)
- ▶ Department Chair Indicator (Full)
- ▶ Distinguished Professor Indicator (Full)
- ▶ Gender
- ▶ Race - collapsed to Caucasian versus non-Caucasian (Asian, Black, Hispanic, or more than 2 races/ethnic groups)

Statistical Models

- ▶ Linear Regression using log transformation of Salary
- ▶ Robust Regression Models using log Salary

Assistant Professor Summary (n = 167)

- ▶ Variables used: Department, Rank at Hire, Race, and Gender

Assistant Professor Summary (n = 167)

- ▶ Variables used: Department, Rank at Hire, Race, and Gender
- ▶ Model explains 95% of the variation in Salaries

Assistant Professor Summary (n = 167)

- ▶ Variables used: Department, Rank at Hire, Race, and Gender
- ▶ Model explains 95% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 2.15% lower [95% CI 4.59% lower to 0.14% higher] than non-Caucasians

Assistant Professor Summary (n = 167)

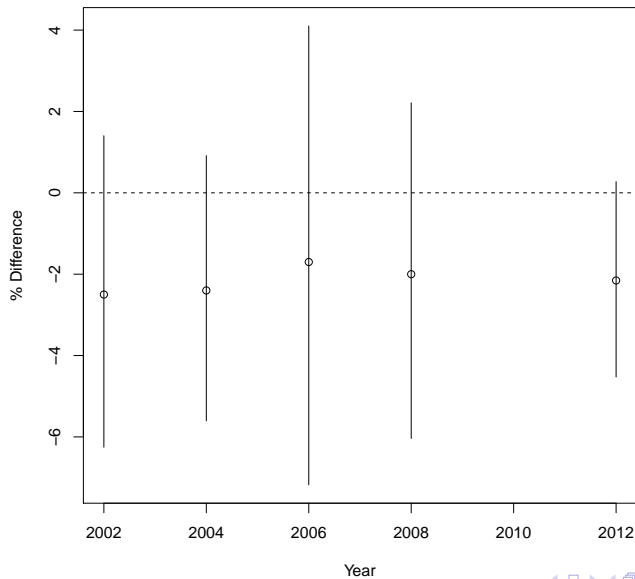
- ▶ Variables used: Department, Rank at Hire, Race, and Gender
- ▶ Model explains 95% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 2.15% lower [95% CI 4.59% lower to 0.14% higher] than non-Caucasians
- ▶ Median Salaries for Males were 1.68% higher [95% CI 0.90% lower to 4.29% higher] than Females

Assistant Professor Summary (n = 167)

- ▶ Variables used: Department, Rank at Hire, Race, and Gender
- ▶ Model explains 95% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 2.15% lower [95% CI 4.59% lower to 0.14% higher] than non-Caucasians
- ▶ Median Salaries for Males were 1.68% higher [95% CI 0.90% lower to 4.29% higher] than Females
- ▶ Neither Gender nor Race are statistically significant predictors of Salary after adjusting for Departments.

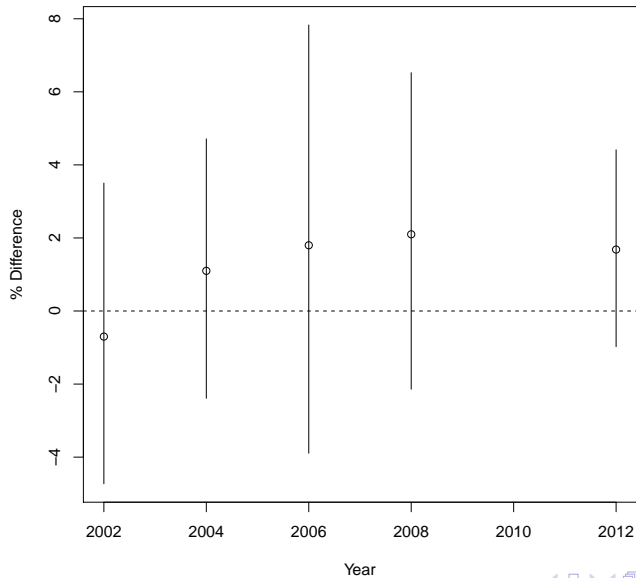
Trend - Race

Assistant Professors: Caucasians minus Non-Caucasians



Trend - Gender

Assistant Professors: Males minus Females



Associate Professor Summary (n = 230)

- ▶ Additional Predictor: Time in Rank

Associate Professor Summary (n = 230)

- ▶ Additional Predictor: Time in Rank
- ▶ Model explains 77% of the variation in Salaries

Associate Professor Summary (n = 230)

- ▶ Additional Predictor: Time in Rank
- ▶ Model explains 77% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 2.78% lower [95% CI 7.44 % lower to 1.52% higher] than non-Caucasians

Associate Professor Summary (n = 230)

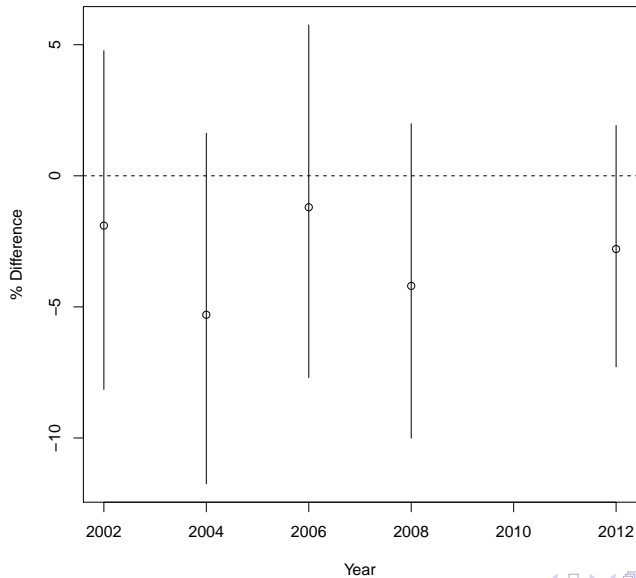
- ▶ Additional Predictor: Time in Rank
- ▶ Model explains 77% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 2.78% lower [95% CI 7.44 % lower to 1.52% higher] than non-Caucasians
- ▶ Median Salaries for Males were 3.75% higher [95% CI 0.93 % lower to 8.64% higher] than Females

Associate Professor Summary (n = 230)

- ▶ Additional Predictor: Time in Rank
- ▶ Model explains 77% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 2.78% lower [95% CI 7.44 % lower to 1.52% higher] than non-Caucasians
- ▶ Median Salaries for Males were 3.75% higher [95% CI 0.93 % lower to 8.64% higher] than Females
- ▶ Neither Gender nor Race are statistically significant predictors of Salary after adjusting for Department, Time in Rank, and Rank in Hire.

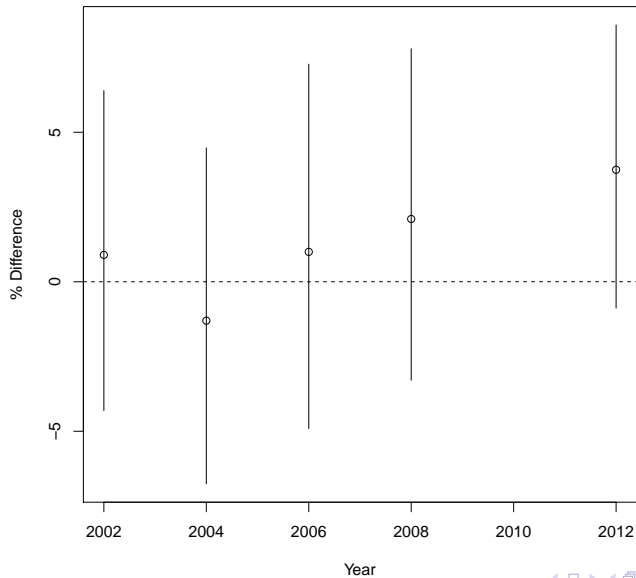
Trend - Race

Associate Professors: Caucasians minus non-Caucasians



Trend - Gender

Associate Professors: Males minus Females



Full Professors ($n = 548$)

- ▶ Predictors: Department, Time in Rank, Rank at Hire, Department Chair, and Distinguished Professor

Full Professors (n = 548)

- ▶ Predictors: Department, Time in Rank, Rank at Hire, Department Chair, and Distinguished Professor
- ▶ Model explains 70% of the variation in Salaries

Full Professors (n = 548)

- ▶ Predictors: Department, Time in Rank, Rank at Hire, Department Chair, and Distinguished Professor
- ▶ Model explains 70% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 0.77% lower [95% CI 5.22% lower to 3.45% higher] than non-Caucasians

Full Professors (n = 548)

- ▶ Predictors: Department, Time in Rank, Rank at Hire, Department Chair, and Distinguished Professor
- ▶ Model explains 70% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 0.77% lower [95% CI 5.22% lower to 3.45% higher] than non-Caucasians
- ▶ Median Salaries for Males were 4.45% higher [95% CI 0.64% to 8.17% higher] than Females

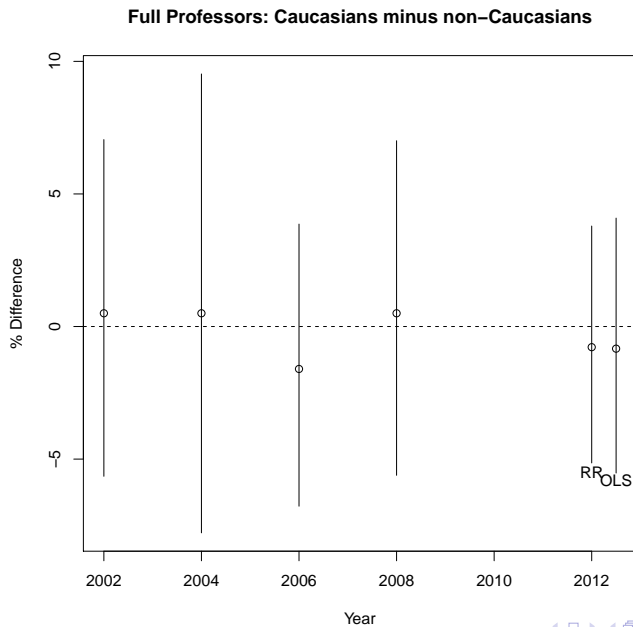
Full Professors (n = 548)

- ▶ Predictors: Department, Time in Rank, Rank at Hire, Department Chair, and Distinguished Professor
- ▶ Model explains 70% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 0.77% lower [95% CI 5.22% lower to 3.45% higher] than non-Caucasians
- ▶ Median Salaries for Males were 4.45% higher [95% CI 0.64% to 8.17% higher] than Females
- ▶ Race is not a statistically significant predictor of Salary after accounting for Departments and other variables

Full Professors (n = 548)

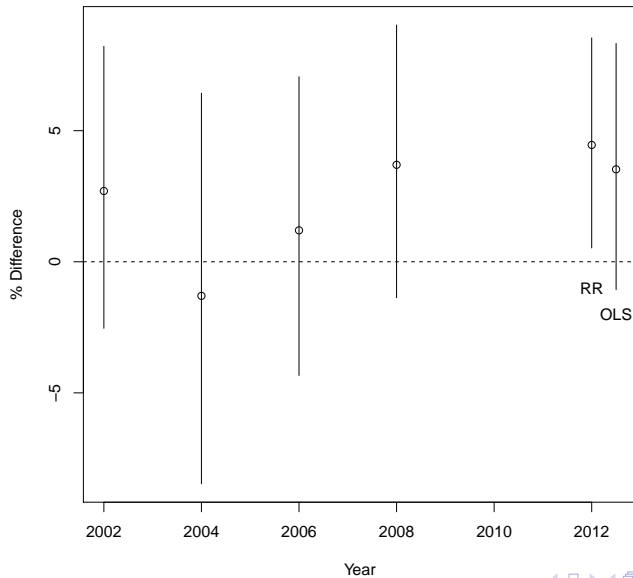
- ▶ Predictors: Department, Time in Rank, Rank at Hire, Department Chair, and Distinguished Professor
- ▶ Model explains 70% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 0.77% lower [95% CI 5.22% lower to 3.45% higher] than non-Caucasians
- ▶ Median Salaries for Males were 4.45% higher [95% CI 0.64% to 8.17% higher] than Females
- ▶ Race is not a statistically significant predictor of Salary after accounting for Departments and other variables
- ▶ Gender does appear to be significant using the robust regression

Trend - Race



Trend - Gender

Full Professors: Males minus Females



Distinguished Professors (n = 212)

- ▶ Model explains 63% of the variation in Salaries

Distinguished Professors (n = 212)

- ▶ Model explains 63% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 4.81% lower [95% CI 10.58% lower to 2.48 % higher] than non-Caucasians

Distinguished Professors (n = 212)

- ▶ Model explains 63% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 4.81% lower [95% CI 10.58% lower to 2.48 % higher] than non-Caucasians
- ▶ Median Salaries for Males were 3.23% higher [95% CI 2.93% lower to 10.01%] higher than Females

Distinguished Professors (n = 212)

- ▶ Model explains 63% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 4.81% lower [95% CI 10.58% lower to 2.48 % higher] than non-Caucasians
- ▶ Median Salaries for Males were 3.23% higher [95% CI 2.93% lower to 10.01%] higher than Females
- ▶ Neither Race nor Gender are statistically significant predictors of Salary after adjusting for other variables

Comments

Differences for Full Professors without the Distinguished Professors

Comments

Differences for Full Professors without the Distinguished Professors

- ▶ Promotions

Comments

Differences for Full Professors without the Distinguished Professors

- ▶ Promotions

- ▶ Decrease Time to Promotion from Associate to Full for Women

Comments

Differences for Full Professors without the Distinguished Professors

- ▶ Promotions
 - ▶ Decrease Time to Promotion from Associate to Full for Women
 - ▶ Differences primarily in Salaries after 2008
 - ▶ Promotion of Female Full Professors to Distinguished Professors

Comments

Differences for Full Professors without the Distinguished Professors

- ▶ Promotions
 - ▶ Decrease Time to Promotion from Associate to Full for Women
 - ▶ Differences primarily in Salaries after 2008
 - ▶ Promotion of Female Full Professors to Distinguished Professors

Next Step

- ▶ Prediction Model (using only Male Faculty Salaries) at each rank

Next Step

- ▶ Prediction Model (using only Male Faculty Salaries) at each rank
- ▶ Identify cases with potential inequity where salary is lower than expected

Next Step

- ▶ Prediction Model (using only Male Faculty Salaries) at each rank
- ▶ Identify cases with potential inequity where salary is lower than expected
- ▶ Further review by the Provost of individual cases to take into account other factors such as quality/productivity of work, salary compression with recent hires, etc

Next Step

- ▶ Prediction Model (using only Male Faculty Salaries) at each rank
- ▶ Identify cases with potential inequity where salary is lower than expected
- ▶ Further review by the Provost of individual cases to take into account other factors such as quality/productivity of work, salary compression with recent hires, etc
- ▶ Increase salary where warranted

Next Step

- ▶ Prediction Model (using only Male Faculty Salaries) at each rank
- ▶ Identify cases with potential inequity where salary is lower than expected
- ▶ Further review by the Provost of individual cases to take into account other factors such as quality/productivity of work, salary compression with recent hires, etc
- ▶ Increase salary where warranted

Limitations

- ▶ Model gives “average” Salary
- ▶ Factors that influence individual Salary but not accounted for:
 - ▶ Difference among sub-fields within a department
 - ▶ Productivity/quality of work
 - ▶ Outside offers from other institutions (formal records are not routinely kept) *Coefficients for new hires at Duke, suggest that increases may be on the order of 15% or more.*
 - ▶ Previous administrative roles
 - ▶ Leaves taken in prior years
 - ▶ Partial retirement not accounted for in system

Full Professors w/out Distinguished Professors (n = 336)

- ▶ Predictors: Department, Time in Rank, New Hire, and Department Chair
- ▶ Model explains 56% of the variation in Salaries
- ▶ Median Salaries for Caucasians were 1.79% higher [95% CI 3.47% lower to 7.64% higher] than non-Caucasians
- ▶ Median Salaries for Males were 5.92% higher [95% CI 0.68% higher to 11.2% higher] than Females
- ▶ Race is not a statistically significant predictor of Salary after adjusting for difference in Salaries explained by Departments and other variables
- ▶ Gender does appear to be significantly associated with Salary after adjusting for the other predictors

Distribution of Positions

	Assistant	Associate	Professor	Distinguished
Female	61	75	79	49
Male	106	155	258	163

	Assistant	Associate	Professor	Distinguished
Asian	38	32	35	20
Black	6	16	10	10
Caucasian	116	174	287	179
Hispanic	6	8	5	3
2+	1	0	0	0

Distributions of Gender by Divisions

	Female	Male
Basic Sciences	24	97
Divinity	7	19
Fuqua School of Business	13	71
Humanities	64	85
Law	12	29
Natural Sciences	29	124
Nicholas School of the Environment	10	38
Pratt School of Engineering	16	80
Sanford School of Public Policy	13	21
School of Nursing	26	4
Social Sciences	50	114

Distributions of Race by Division

	Hispanic	2+	Asian	Black	Caucasian
Basic Sciences	5	0	22	0	94
Divinity	1	0	0	3	22
Fuqua	2	0	17	1	64
Humanities	5	0	13	15	116
Law	0	0	2	2	37
Natural Sciences	1	0	33	4	115
NSoE	2	0	3	0	43
Pratt	3	0	20	3	70
Sanford	0	1	2	2	29
School of Nursing	0	0	3	0	27
Social Sciences	3	0	10	12	139