

Final Project

DATA 557

Background

Differences in salaries between men and women are well-documented in many labor markets, including at U.S. colleges and universities. Because salary discrimination based on sex is illegal in the U.S., there is considerable controversy over whether observed differences between male and female faculty members' salaries are due to sex-based bias or discrimination. Other explanations that have been put forward for salary disparities between men and women include differences in experience, degree attained, the field in which one works, administrative responsibilities, and productivity, among others.

Two general approaches are possible for investigating the presence of sex bias. One approach involves attempting to determine whether individuals have been victims of bias by examining their particular circumstances. The other approach examines salaries at the group level and attempts to uncover differences in average salary between groups of men and women within an institution. This is the general approach we will take in this project.

There are many factors influencing faculty salaries, and each of these may be confounded with sex differences. Market forces are important at some universities; salaries may be determined by the demand for experts in certain fields and/or by salaries offered outside the university. Thus, higher values may be placed on some fields within the university and faculty within those areas will be paid higher salaries.

Experience is another factor that influences faculty salaries. A faculty member's salary tends to increase with the amount of time that person is employed at the university. If the faculty member is hired after having worked at another institution, then their prior experience may be used in determining their salary. Sometimes salary increases are given when a faculty member is promoted from one rank to another, although these increases are not necessarily based solely on the promotion. Furthermore, universities generally follow strict timetables regarding promotion from Assistant Professor to Associate Professor: most faculty are considered for promotion in their sixth year, and if they are not promoted, they generally are only allowed to stay on at the university one more year. There is no similar timetable for promotion from Associate Professor to full Professor.

A faculty member's salary is also influenced by their productivity. Many different productivity measures can be used, including research grant funding, number of papers published, teaching performance, and administrative duties, among others.

The Data

The data used in this analysis consist of faculty members' salaries at a single U.S. university. Data were collected on 1,597 faculty members employed at the university in 1995 (medical school faculty were excluded). Monthly salary was determined for each faculty member for each year from 1976 through 1995. Other variables available include sex, highest degree attained, year of highest degree, field, year hired, rank, and administrative duties. Note that rank and administrative duties may change over time but the others are constant over time.

The file **salary.txt** is in free-field format with tabs separating the fields. Each record in the data file represents information on salary and the other variables for a particular faculty member in a particular year

(there are 19,792 records). Missing data is denoted by **NA**. The first line of the file contains the variable names.

Variable Definitions

- **case**: case number
- **id**: identification number for the faculty member
- **sex**: M (male) or F (female)
- **deg**: highest degree attained: **PhD**, **Prof** (professional degree, e.g., medicine or law), or **Other** (Master's or Bachelor's degree)
- **yrdeg**: year highest degree attained
- **field**: **Arts** (Arts and Humanities), **Prof** (professional school, i.e., Business, Law, Engineering, or Public Affairs), or **Other**
- **startyr**: year in which the faculty member was hired (2 digits)
- **year**: year (2 digits)
- **rank**: rank of the faculty member in this year: **Assist** (Assistant), **Assoc** (Associate), or **Full** (Full)
- **admin**: indicator of whether the faculty member had administrative duties (e.g., department chair) in this year: 1 (yes), or 0 (no)
- **salary**: monthly salary of the faculty member in this year, in dollars

Questions of Interest

In your project, please consider the following questions with respect to both direction **and magnitude**:

1. Does wage discrimination exist in the starting salaries of faculty members (i.e., salaries in the year hired)?
2. Does wage discrimination exist in granting promotions from Associate Professor to Full Professor?
3. Overall, how would you answer the question: *Is there wage discrimination in salaries at the university?*
4. What issues are involved in generalizing your results?

Project Details

There will be a number of project milestones to guide you through this project. Details on these will be posted to Canvas.