Overview

This assignment aims to analyze the unconditional gender gap and its variation with the level of education for the occupations of Financial Managers (0120) and Financial Specialists (0800-0950). The additional considerations regarding the options for modeling as well as the interpretation of the key coefficients will also be explained in detail. GitHub repository: https://github.com/Alejandra-savagebriz/DA2

Unconditional gender gap

The unconditional gender gap is the difference in earnings between men and women, regardless of any other factors. To examine this, financial managers who had advanced degrees, aged between 24 and 65 were considered. Those who worked more than 20 hours a week or had no earnings were left out of the sample.

In the first regression, it was found that women earned 22.1 log points less than men, on average, implying that women earned about 22% less than men. Comparing employees of the same age, women are expected to earn around 21% (21.1 log points) less than men in this sample; 1 year older employees are expected to earn 0.6% more on average, other things equal.

To investigate the relationship between *gender* and *age* further, a third regression with *female,* as the dependent variable, and *age,* as the independent variable, was conducted resulting with -1.595 for the age coefficient, meaning that women were more likely to be younger than men. [See Table 1]

The unconditional gender wage gap is 22%, and the observed difference between this and the gender gap conditional on age is minimal (0.1%). Among financial managers, men tend to cluster more in the 45-54 age group, while women spread out more uniformly across different age groups. The largest group of women holding a graduate degree falls within the 40-45 age range, while men with similar qualifications peak around the same age range, gradually tapering off by the time they hit 55-60. [See Graph 1]

After the introduction of functional forms, such as polynomial terms, to the gender gap analysis revealed *statistically significant coefficients* for the higher-order polynomials. This indicates a nonlinear relationship between *age* and *earnings*, where models of high complexity are providing better predictive performance. However, for understanding the average gender gap in earnings, this increased complication may not be as crucial as it is for predictive purposes.

Gender gap variation with the level of education

This analysis focused on financial managers with a graduate degree (professional, master's, or doctoral degree). Three regressions were conducted to examine the gender wage gap. The first regression, without controlling for *education*, showed that women earn 8.7% less than those with a professional degree and 9% less than those with a PhD degree when compared to those with a master's degree. Even after considering education levels, the following regressions confirmed that the gender wage gap persists, indicating that factors beyond education play a role. The data indicates that women tend to have more lower-paying master's degrees compared to higher-paying professional or PhD degrees, yet this trend only partially clarifies the existing gender wage gap. [See Table 2]

Conducting gender regressions separately, clear differences in the relationship between age and earnings for men and women were noted: For each year of age, women experienced a slightly lower increase in average earnings (0.5%) compared to men (0.6%). Additionally, the association between *log earnings* and *age* was less positive for women, suggesting a widening earnings gap between *genders* as they age. This was supported by the addition of an interaction term, "female * age," which revealed an increasing earnings inequality between male and female workers as they age. The average wage gap increased from approximately 5% for people aged 25-30 to 18% by age 65, remaining constant between ages 40 and 55. These findings imply that the gender wage gap is not only constant, but also, wider over time. [See Graph 2]

Earning differences considering additional factors

An additional analysis was conducted to examine potential differences in earnings among groups, specifically between women and men. By controlling for various factors such as *race, ethnicity, nativity, marital status, number of children*, and *social class*, this aimed to establish some causality. The findings revealed a persistent gender earnings gap of 34.5%, even after adjusting for personal, family, and other job characteristics. While this disparity suggests the existence of gender-based differences in earnings, it does not directly prove discrimination as the only cause. The observed difference can arise from other external factors. Therefore, without further evidence, attributing the earnings difference to discrimination remains unreliable.

Table 1: Gender differences in earnings – log earnings and gender

	(1) ln wage	(2) ln wage	(3) age
ln wage			
female	-0.221***	-0.211***	-1.595
	(0.056)	(0.056)	(1.246)
age		0.006**	
		(0.003)	
Constant	3.755***	3.485***	45.030***
	(0.034)	(0.134)	(0.752)
Observations	267	267	267
R2	0.055	0.072	0.006
Adjusted R2	0.052	0.065	0.002
Residual Std. Error	0.441 (df=265)	0.438 (df=264)	9.796 (df=265)
F Statistic	15.728*** (df=1; 265)	11.398*** (df=2; 264)	1.640 (df=1; 265)
Note:	*p¡0.1; **p¡0.05; ***p¡0.01		

Graph 1: Kernel density estimates of age distribution of employees with a graduate degree separately for female and male.
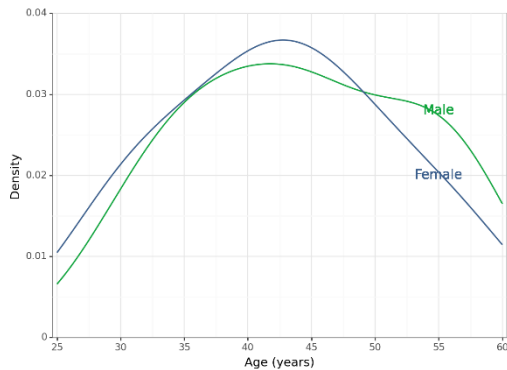
Table 2: Gender differences in earnings – log earnings, gender and education

	(1)	(2)	(3)
female	-0.221***	-0.219***	-0.219***
	(0.056)	(0.056)	(0.056)
ed_Profess	-0.087	0.005	
	(0.122)	(0.222)	
ed_Phd	-0.092		
	(0.188)		
ed_MA		0.092	
		(0.188)	
Constant	3.755***	3.760***	3.667***
	(0.034)	(0.035)	(0.184)
Observations	267	267	267
R2	0.055	0.058	0.058
Adjusted R2	0.052	0.047	0.047
Residual Std. Error	0.441 (df=265)	0.443 (df=263)	0.443 (df=263)
F Statistic	15.728*** (df=1; 265)	5.588*** (df=3; 263)	5.588*** (df=3; 263)
Note:	*p¡0.1; **p¡0.05; ***p¡0.01		

Graph 2: Gender differences in earnings by gender as a function of age versus log earnings, gender, 4th-order polynomial of age, and their interaction