Problem Set #9
Sonoma State University
Economics 317- Introduction to Econometrics

Analyzing Male-Female Wage Differentials I

(a) Using the data set Wage1.dta,
(i) Compare the average wage of men and women in the sample. Is there a
difference between male and female wages?
(ii) Show graphically the distribution of wages for males and females
separately. Describe your graphs.

(b) Perform a hypothesis test on the difference between the mean wage of men and
women. Be sure to formally state your null and alternative hypothesis.

(i) Calculate the critical wage differential.
(ii) Is the observed difference between male and female wages statistically
significant? Explain fully.

(c) Estimate the wage equation: Wage = \( \beta_0 + \beta_1 X_1 + U \).
Where: Wage is the hourly wage rate and
\( X_1 \) is a dummy variable for females.

(i) How much of the variation in wages is explained by gender?
(ii) Interpret the coefficient on female. Is it statistically significant?
(iii) Show your regression equations graphically in a scatter diagram.
Describe your graph.

(d) Are your results consistent with the hypothesis test in (b)?

(e) Consider the following wage equation:
Wage = \( \beta_0 + \beta_1 X_1 + \beta_2 X_2 + U \).
Where \( X_1 \) = Experience.
\( X_2 \) = Female.

(i) What are the expected signs of the coefficients?
(ii) Write out the regression equation for men.
(iii) Write out the regression equation for women.

(f) Estimate the above equation.
(i) How much of the variation in wages is explained by the model.
(ii) Interpret your estimated coefficients. Are your estimated coefficients
significant?
(iii) Show your regression equations graphically in a scatter diagram.
Describe your graph.
(g) Construct the interaction variable between female and experience. Interpret this variable.

Consider the regression equation:
Wage = β₀ + β₁X₁ + β₂X₂ + β₃X₃ + U.
Where X₁ = Experience.
X₂ = Female.
X₃ = Interaction variable.

(i) What are the expected signs of the coefficients?
(ii) Write out the regression equation for men.
(iii) Write out the regression equation for women.

(h) Estimate the above equation:
(i) How much of the variation in wages is explained by the model.
(ii) Interpret your estimated coefficients. Are your estimated coefficients significant?
(iii) Show your regression equations graphically in a scatter diagram. Describe your graph.