

Econometrics I

Fall 2006

Assignment 4

Today's Date: September 26

Due Date: October 3

Please show all of your work and clearly indicate your final response to each question. You are to write your own GAUSS (or MATLAB, Fortran, etc.) program in answering each of the computational questions.

1. Using the data set described in the assignment of last week, estimate the regression model

$$wage = \beta_0 + \beta_1 Less_HS + \beta_2 HS_dip + \beta_3 Age + \beta_4 Male + \varepsilon, \quad (1)$$

where ε is mean independent of the regressors. Assume that

$$E(\varepsilon^2|X) = \sigma^2 Age$$

- (a) Compute the standard errors of the $\hat{\beta}$ under the (incorrect) homoskedasticity assumption.
 - (b) Compute the standard errors of the $\hat{\beta}$ using the “correct” estimate of the covariance matrix of the ε .
 - (c) Compute the HEW standard errors of the OLS estimator $\hat{\beta}$.
 - (d) Compute the GLS estimator of β . Before doing so, state why your estimator is GLS and not Feasible GLS.
 - (e) Summarize what you have learned by comparing the results of the analyses conducted in (a) – (d).
2. You are to reestimate the specification in (1) with the dependent variable $\ln(wage)$. Continue to assume mean independence, but assume that the conditional variance function is

$$E(\varepsilon^2|Male, Age) = \exp(\alpha_0 + \alpha_1 Male + \alpha_2 Age).$$

- (a) Estimate the model using OLS. Using the conditional variance specification, find a consistent estimator of the OLS standard errors.

- (b) Use the conditional variance specification to estimate β using FGLS.
 - (c) Comment on the results in (a) and (b).
3. Which specification of the wage equation makes more sense to you, the one given in Problem 1 or the one given in Problem 2? Reasons should ideally be based on both statistical and economic considerations.
 4. Text 7.23
 5. Text 7.24