

Homework 5
ECON 4818
Professor Martins

1. From your textbook, answer questions 5 and 6 from Chapter 2, question 4 items (i)-(iii) in Appendix C, and questions 1, 2, 3 and 4 in Appendix D.
2. Consider the following simple linear regression model:

$$Y_i = \beta X_i + U_i \text{ for } i = 1, 2, \dots, n.$$

where $E(U_i|X_i) = 0$ and $V(U_i|X_i) = \sigma^2$ and $\{U_i\}_{i=1}^n$ is a sequence of independent and identically distributed random variables.

- (a) Obtain the least squares estimator for β . Show that this estimator is unbiased and obtain its variance. Does the variance approach zero as the sample size $n \rightarrow \infty$? If so, is this a desirable property? Why?
- (b) Obtain an unbiased estimator for σ^2 .