

Econometrics I
Fall 1999
Assignment 4

Today's Date: 10/05/99

Due Date: 10/11/99

1. G 5.2
2. G 5.3
3. G 5.7
4. G 6.1
5. In a population, the proportion of individuals in occupation A is .2, in occupation B is .5, and in occupation C is .3. The earnings (Y) of individuals in occupation i is distributed as a negative exponential, with density

$$f_{Y|I}(y|I = i) = \lambda_i \exp(-\lambda_i y); \quad y > 0, \quad i = A, B, C,$$

where $\lambda_A = .1$, $\lambda_B = .2$, and $\lambda_C = .5$.

- (a) Find $E(Y|I)$.
 - (b) Find $P(I = i|Y)$, $i = A, B, C$ [you need only solve for two of these since $P(I = C|Y) = 1 - P(I = A|Y) - P(I = B|Y)$]. Note that these conditional probabilities can also be viewed as conditional expectations of the random variables $\chi[I = i]$, which take the value 1 if $I = i$ and otherwise are equal to 0. Use these expressions to evaluate the following:
 - i. $P(I = A|Y = 10)$.
 - ii. $P(I = C|Y = 2)$.
 - iii. $P(I = B|Y = 5)$.
 - (c) "Decompose" the total variance in earnings into components attributable to the between group [i.e., occupation] variance and the within group variance using $T10$ on page 48 of Goldberger. What do you conclude about the "explanatory power" of occupation?
6. MGB IV.14 (page 170)