Question 3

Use the data in APPLE.RAW for this question. These are phone survey data. where each respondent was asked the amount of "ecolabaled" (or "ecologically friendly") apples he or she would purchase at given prices for both ecolabaled apples and regular apples. The prices are cents per pound, and ecolbs and reglbs are both in pounds.

(a) For what fraction of the sample is ecolbsi = O? Discuss generally whether ecolbs is a good candidate for a Tobit model.

(b) Estimate a linear regression model for ecolbs, with explanatory variables log(ecoprc), log,(regprc), log(famine), educ, hhsize, and num$5_1$7. Are the signs of the coefficient for log(ecoprc) and log(regprc) the expected ones? Interpret the estimated coefficient on log(ecoprc).

(c) Test the linear regression in part b for heteroskedasticity by running the regression u^2 2 on 1, ecolbs, ecolbs2 and carrying out an F test. What do you conclude?

(d) Obtain the OLS fitted values. How many are negative?

(e) Now estimate a Tobit model for ecolbs. Are the signs and statistical significance of the explanatory variables the same as for the linear regression model? What do you make of the fact that the Tobit estimate on log(ecoprc) is about twice the size of the OLS estimate in the linear model?

(f) Obtain the estimated partial effect of log(ecoprc) for the Tobit model using the following equation:

$$\frac{\partial E(y|x)}{\partial x} = \Phi(x\beta/\sigma)\beta,$$

where the x are evaluated at the mean values. What is the estimated price elasticity (again, at the mean values of the x)?

(g) Reestimate the Tobit model dropping the variable log(regprc). What happens to the coefficient on log(ecoprc)? What kind of correlation does this result suggest between log(ecoprc) and log(rcgprc)?

(h) Reestimate the model from part (e), but with ecoprc and regprc as the explanatory variables, rather than their natural logs. Which functional form do you prefer? (Hint: Compare log-likelihood functions.)