EXERCISE 7

Purpose: To learn how to estimate and analyze a **Tobit Model** (named after the Nobel Prize winner James Tobin). This model is useful when a limited dependent variable is roughly continuous over strictly positive values of the dependent variable but zero for a nontrivial fraction of the population. This model is a special case of the **Censored Regression Model**. The Tobit is a Censored Regression model that is left-censored at zero. The general Censored Regression model allows left-censoring, right-censoring, or both. **Censored** observations occur when all of the population can be sampled but for some reason (like top-coding) the observations on the dependent variable are bounded by an upper bound or a lower bound or both, with several observations occurring at the boundary (or boundaries).

Go to my website and download the data file Affair.dat and the SAS program Affair.sas. Affair.dat is the data on extramarital affairs analyzed by Fair (1978). The variables in the Fair data set are (in order left to right) the dependent variable **y_pt** = number of extramarital affairs and the explanatory variables **z1** = male dummy (1 for male, 0 for female), **z2** = age, **z3** = number of years married, **z4** = child dummy (one for children, 0 otherwise), **z5** = a measure of how religious the person is, **z6** = level of education of person, **z7** = occupation of person, and **z8** = a measure of marriage satisfaction. The number of observations is 601. Import the Affair.dat data into an EVIEWS workfile that, let's say, you call it Affair.wf1. Use this EVIEWS workfile to answer the following questions:

(a) Before starting your analysis of the Fair data, specify what you think should be the appropriate signs of the coefficients on the explanatory variables. Explain your reasoning.

(b) Use the **backward selection technique** to build a final model of extramarital affairs. Report your final model including estimated coefficients and standard errors. Are the signs of the coefficients on the remaining variables the same as you expected (in part (a))? Are you surprised at which variables turned out to be statistically insignificant and which variables turned out to be statistically significant? Explain your reasoning.

(c) Use EVIEWS to print out the actual and predicted number of extramarital affairs of the first and last 20 people in the Fair data set. **Among the first 20 individuals,** which three individuals, according to your final Tobit model, demonstrated the most "restraint" by having no extramarital affairs? Explain your reasoning. **Among the last 20 individuals**, which three individuals demonstrated the least "restraint" in having extramarital affairs? Explain your reasoning.

(d) You will notice that the SAS program Affairs.sas conducts the same analysis as conducted by your EVIEWS program. Run the program and verify that the answers SAS produces are almost identical to what you obtained in EVIEWS. Note Proc Lifereg has the capability of estimating Censored Regression models of the left-censored, right-censored, and left- and right-censored types.