

Homework

Econ 6243

November 2, 2011

Using the `auto.dta` data, complete the following.
Consider the following model:

$$\Pr(y_t = 1) = F(\beta_1 + \beta_2 \text{weight}_t + \beta_3 \text{mpg}_t) \quad (1)$$

where y_t is equal to 1 if the car is foreign and is zero otherwise.

1. Estimate the model as a linear probability model. Estimate two versions. One using ols with robust standard errors and one using fgls. You'll need to check for negative variances and make adjustments as needed. Use both the truncated (omit the negative ones) and censored versions (set the negatives to 0.01) of the correction.
2. Estimate the model using probit and logit. Compare estimates and t-ratios to each other and to those in part 1. Are there any significant differences? Is this to be expected?
3. Compare the classification tables for the different estimators. Any significant differences?
4. You suspect that variance depends on price. Use the GNR to test for heteroskedasticity. Let $\alpha = 0.05$
5. Use the GNR to test for adequacy of the functional form of the linear index. Let $\alpha = 0.05$
6. Estimate the model as a heteroskedastic probit, again using price as the cause of heteroskedasticity. Test the hypothesis that the model is homoskedastic at the 5% level. Use both a Wald type test and a LR test.
7. Compute the marginal effect of an increase in mpg on the probability that a car is foreign. Compare the AME to the ME at the average. Also, compute the marginal effects at the medians. How do these compare to the ME from the LPM?