

Economics 696F, Homework 4

Due Friday, March 3, 2006

This homework continues from HW3. Use the maximum likelihood programs you wrote in HW3 (you may revise them if you discover errors).

Data for this homework is contained in the file `hw4.dat`, a text file with the first column containing observations on y , a binary outcome variable, and the second column containing observations on w , a continuous regressor.

As in the previous model, assume a logit model

$$Pr(y = 1|x) = \frac{\exp(x'\beta)}{1 + \exp(x'\beta)}.$$

Here, $x = (1, w)$ is a 2×1 vector including a constant and the continuous regressor w .

1. Use your ML routine to calculate the ML estimate of β , and report the result.
2. Now, suppose that the sample was a choice-based sample (with strata corresponding to the two possible values of y with known population shares). Assume that $Q_s = 1/4$ for $y = 0$ and $Q_s = 3/4$ for $y = 1$. Use your weighted ML routine and provide estimates of β .
3. Return to assuming standard IID sampling and your (unweighted) ML estimator. Implement a parametric bootstrap to estimate the asymptotic standard error of the estimator.
4. Repeat question 3, but using the nonparametric bootstrap.