Empirical IO II
Assignment 2

Spring 2024

To be submitted through Canvas before Friday March 29th 6:00pm. When asked to report results present the answer in tables. You should also attach the code you used to generate the results.

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1 Bresnahan and Reiss (1991)

Download from the Canvas web site the file ps2.csv in CSV format. This file contains data for tire dealers used in the paper by Bresnahan and Reiss (1991). There are 12 variables:

ID: unique market identifier
TIRE: number of tire dealers in the market (county)
TPOP: Town population (in thousands)
NGRW: Negative TPOP growth
PGRW: Positive TPOP growth
OCTY: Commuters out of the county (in thousands)
OPOP: Nearby Population (in thousands)
LANDV: Value per acre of farm-land and buildings ($1,000s)
ELD: 65 years and older divided by county population
FFRAC: Fraction of land in farms
PINC: Per capital income ($1,000's)

LNHDD: Log of heating degree days

Your task is to replicate the estimates for the tire dealers column of Table 4 (p. 994) of the paper. The model considered by Bresnahan and Reiss (1991) and studied in class is as follows (please refer to the paper for details):

$$S = tpop + \lambda_1 nrgw + \lambda_2 pgrw + \lambda_3 octy + \lambda_4 opop \tag{1}$$

$$V_N = \alpha_1 + \beta_1 ffrac + \beta_2 eld + \beta_3 pinc + \beta_4 lnhhd - \sum_{n=2}^{N} \alpha_n \tag{2}$$

$$F_N = \gamma_1 + \gamma_L landv + \sum_{n=2}^{N} \gamma_n \tag{3}$$

The per-firm profit in an N-firm market is:

$$\Pi_N = S\, V_N - F_N + \epsilon \tag{4}$$

where ϵ is a market-specific error term that is distributed i.i.d. N(0,1) across all markets.

The econometric model is an ordered probit model with latent variable (profit) that depends on the number of active firms. The dependent variable is the number of tire dealers. This variable can take on the values {0,1,2,3,4,5+}.

1.1 (100 points)

Reproduce the results for the tire dealers reported in Table 4 of the paper. Note that Bresnahan and Reiss (1991) estimate the model imposing the constraints $\alpha_n \geq 0$ and $\gamma_n \geq 0$. You should impose the same constraints.