Generated Y (from DGP Tab)

Assumed Distribution



Statistical Model

$$egin{aligned} Y_i^* &\sim \mathrm{STL}(\mu_i) \ \mu_i &= X_i eta &= eta_0 + eta_1 X_i \ Y_i \perp \!\!\! \perp Y_j \quad orall \ i &\neq j \ \end{aligned} \ y_i &= egin{cases} 1 & ext{if} \quad y_i^* < au_0 \ 2 & ext{if} \quad au_0 \leq y_i^* < au_1 \ 3 & ext{if} \quad au_1 \leq y_i^* \ \end{cases} \ au_1 &= \exp(\gamma) \end{aligned}$$

Log Likelihood

Likelihood for data $y = (y_1, \ldots, y_n)$: $L(\beta, \gamma | y, X) = k(y) \cdot \prod_{i=1}^n [\Pr(Y_i = j)]$ $\ln[L(\beta, \gamma | y, X)] \doteq \ln[F_{stl}(\exp(\gamma_j)|x_i\beta)] - F_{stl}(\exp(\gamma_{j-1})|x_i\beta)]$

Maximum Likelihood Estimates

$$\hat{\theta} = [\hat{eta}_0, \hat{eta}_1, \hat{eta}_2, \hat{\gamma}]$$

= [-1.29, -1.11, 2.56, 0.55]

$$\hat{V}(\hat{\theta}) = \begin{bmatrix} 0.59 & 0.02 & -0.88 & 0.01 \\ 0.02 & 0.16 & -0.26 & -0.02 \\ -0.88 & -0.26 & 1.97 & 0.06 \\ 0.01 & -0.02 & 0.06 & 0.09 \end{bmatrix}$$

Guesstimate







