

CSSS 510: Lab 5

Ordered Probit

2017-11-10

0. Agenda

1. Deriving a likelihood function for the ordered probit model
2. Fitting an ordered probit model using `optim()` and `glm()`
3. Interpreting the results
4. Simulating predicted values and confidence intervals
5. Evaluating goodness of fit

1. Deriving a likelihood function for ordered probit

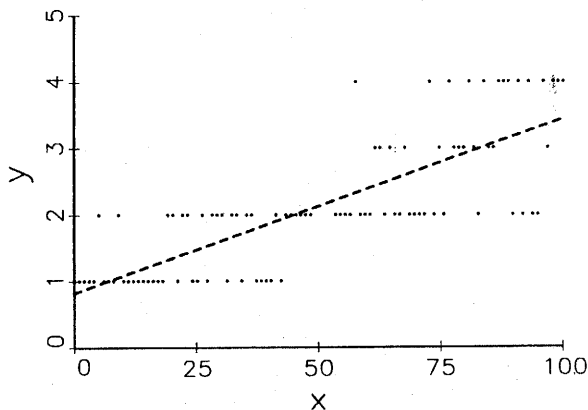
Recall from lecture the ordered probit model:

$$\Pr(y_i = j | \mathbf{x}_i) = \int_{\tau_{j-1}}^{\tau_j} \text{Normal}(\mathbf{x}_i \boldsymbol{\beta}, 1) d\mathbf{x}_i \boldsymbol{\beta}$$

How does this model differ from the others we've covered so far in the course?

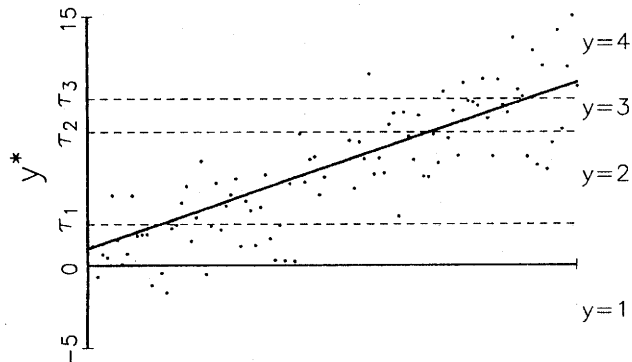
1. Deriving a likelihood function for ordered probit

Panel B: Regression of Observed y



1. Deriving a likelihood function for ordered probit

Panel A: Regression of Latent y^*



1. Deriving a likelihood function for ordered probit

$$\Pr(y_i = 1 | \mathbf{x}_i) = \Pr(\tau_0 \leq y_i^* < \tau_1 | \mathbf{x}_i)$$

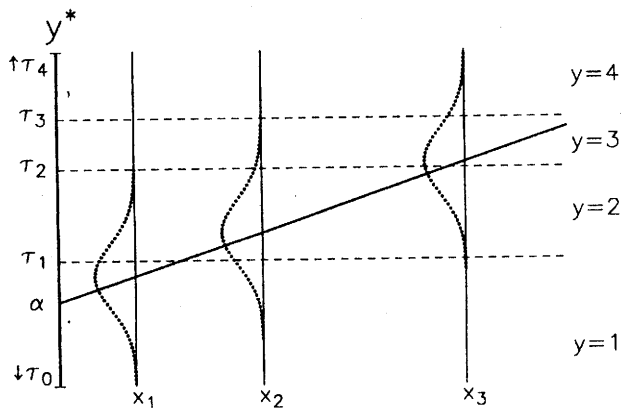


Figure 5.2. Distribution of y^* Given x for the Ordered Regression Model