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

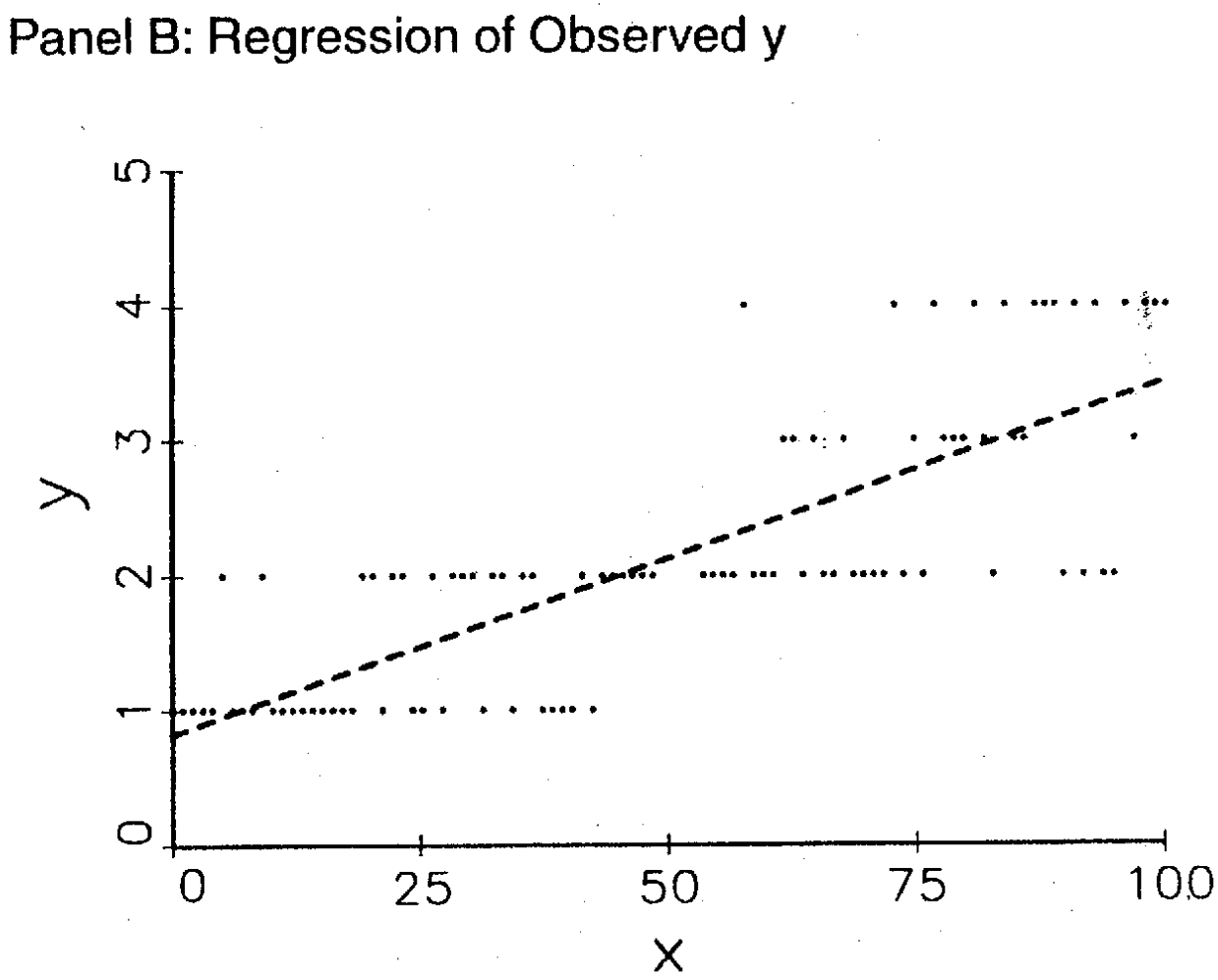
1. Deriving a likelihood function for ordered probit

Recall from lecture the ordered probit model:

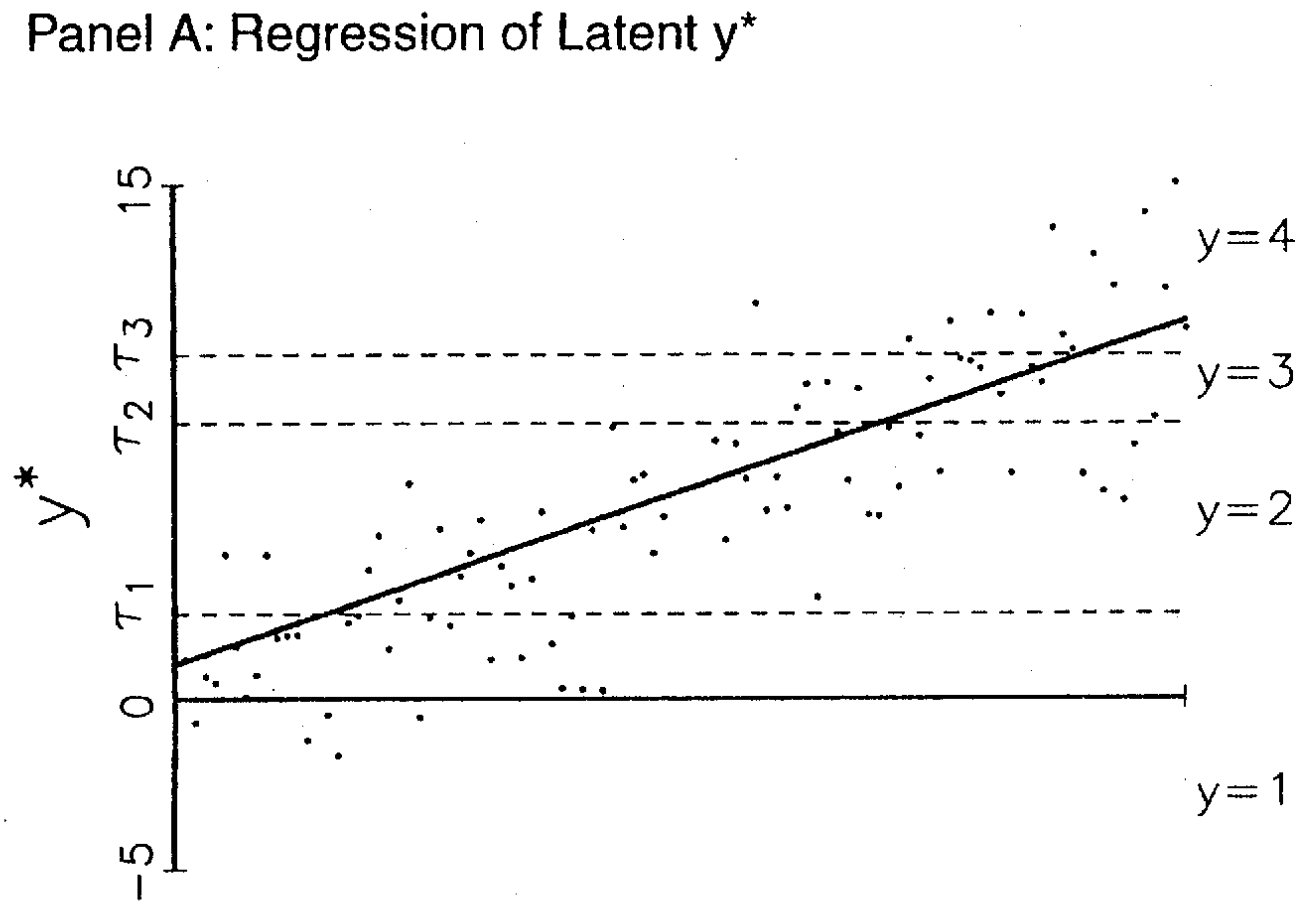
$$\Pr(y_i = j|\boldsymbol{x}_i) = \int_{\tau_{j-1}}^{\tau_j} \text{Normal}(\boldsymbol{x}_i\beta, 1)\text{dx}_i\beta$$

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

1. Deriving a likelihood function for ordered probit



1. Deriving a likelihood function for ordered probit



1. Deriving a likelihood function for ordered probit

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

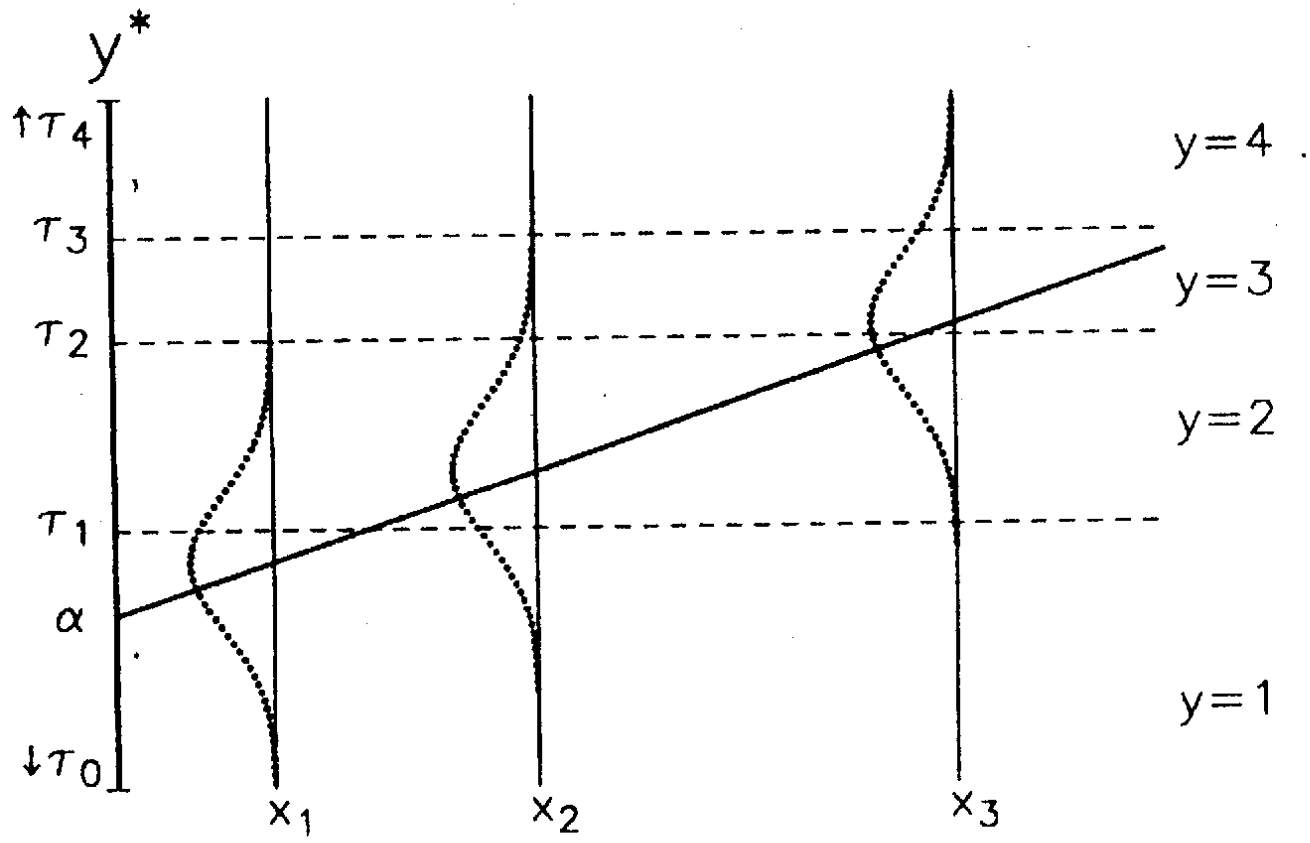


Figure 5.2. Distribution of y^* Given x for the Ordered Regression Model