

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0, \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad 1$$

$$\ln Li(\beta) = y_i \log\{\phi(x_i\beta)\} + (1 - y_i)\log\{1 - \phi(y_i\beta)\} \quad 2$$

$$Pr(y_i^* > 0|x_i) = \phi(x_i\beta) \quad 3$$