

Ch: 17 Binary Dependent Variables

Latent variable framework

Latent (unobserved) var.

$$y^* = \beta_0 + \beta_1 x + u$$

such that $y = 0$ if $y^* < 0$
 $y = 1$ if $y^* \geq 0$

↓

$$\beta_0 + \beta_1 x + u \geq 0$$

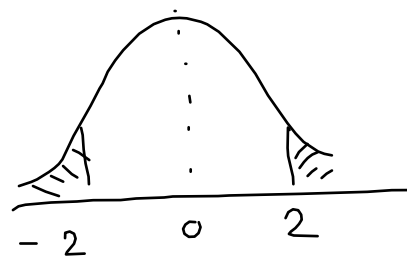
or, $u \geq -\beta_0 - \beta_1 x$

$$P(y=1 | x) = P(u \geq -\beta_0 - \beta_1 x)$$

↳ b/w 0 and 1

Probit

$$u \sim N(0,1)$$



$$P(y=1|x) = P(u \geq -\beta_0 - \beta_1 x)$$

$$= P(u \leq \beta_0 + \beta_1 x)$$

$$= \Phi(\beta_0 + \beta_1 x)$$

$\hat{\beta}_0, \hat{\beta}_1$: from maximum likelihood estimation.