1.3 Estimating the Betas

Wednesday, January 13, 2021 10:03 PM

$$y_i = E(y|x) + \Lambda_i = \sum_j \beta_j x_{ij} + \Lambda_i$$

$$\Lambda_i = y_i - \sum_j \beta_j x_{ij}$$

$$\Lambda_i^2 = (y_i - \sum_j \beta_j x_{ij})^2$$

$$SSR = \sum_i \Lambda_i^2 = \sum_i (y_i - \sum_j \beta_j x_{ij})^2$$

Sample

$$\sum \hat{\Lambda}_i^2 = \sum_i (y_i - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \dots - \hat{\beta}_k x_{ik})^2$$

$\hat{\beta}$ is best estimate of β

$\hat{y}$ is best prediction of y

$$\hat{y}_i = \hat{\beta}_0 + \hat{\beta}_1 x_{i1} + \dots$$

$$\hat{\Lambda}_i = y_i - \hat{y}_i$$

Min sample SSR OLS