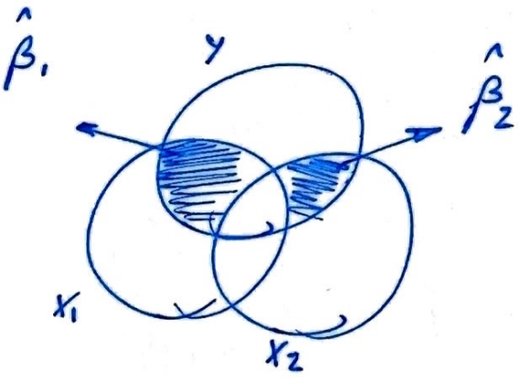
So far $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$



OLS is unbiased

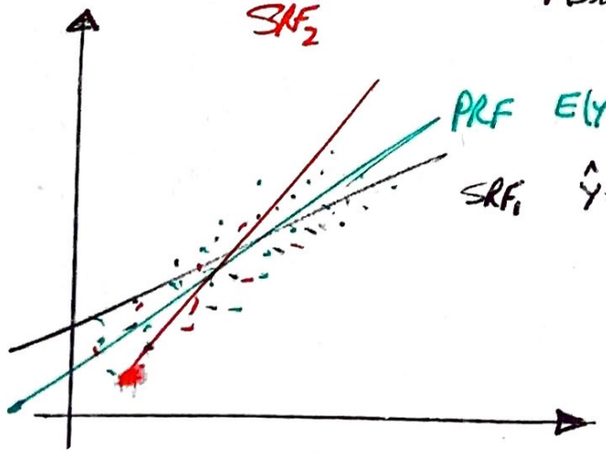
$E(\hat{\beta}_j) = \beta_j$

- MLR1. linear in β
- MLR2. Rand Sampling
- MLR3. $Var(x) \neq 0$ and No Perfect collinearity
- MLR4. $E(u|x) = 0$
- MLR5. $Var(u|x) = \sigma^2$ Homosk

Gauss_Markov Ass Says Nothing about dist of $\hat{\beta}_j$

- MLR6. u indep of x and $u \sim N(0, \sigma^2)$ → CLM Assumption → Strong

$$Var(\hat{\beta}_j) = \frac{\sigma^2}{SST_j (1 - R_j^2)} = \frac{\sigma^2}{SST_j} Vif_j$$



PRF $E(y|x) = \beta_0 + \beta_1 x_1$

SRF $\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x$

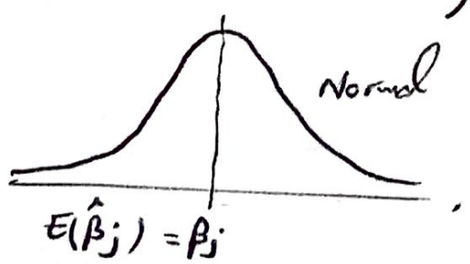
$E(u) = 0$

$E(u|x) = 0$

$Va E(u|x) = \sigma^2$

having Ass 3 & 4 in it

$\hat{\beta}_j \sim N(\beta_j, Var(\hat{\beta}_j))$



$$Var(\hat{\beta}_j) = \frac{\sigma^2}{SST_j} Vif_j$$

$\Rightarrow$ dist $\hat{\beta}_j$ ✓ → Ho testing