CHAPTER 5

Multiple Regression Analysis:

OLS Asymptotics

Gauss-Markov Assumptions

MLR1. linearity in β

MLR2. Random Sampling

MLR3. $Var(x_j) \neq 0$ and No Perfect Collinearity

MLR4. $E(u|X) = 0$

MLR5. $Var(u|x) = \sigma^2$

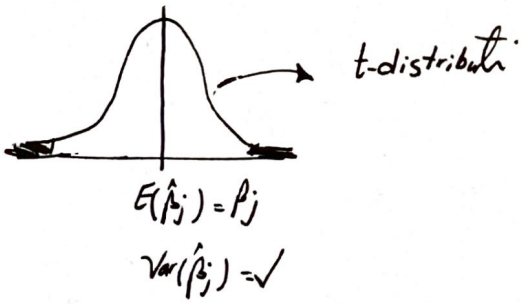
MLR6. $u \& X_j$ are indep + $u \sim N(0, \sigma^2)$

Classical linear Model Assumption

MLR1-4: unbiasedness $E(\hat{\beta}_j) = \beta_j$

MLR1-5: $Var(\hat{\beta}_j) = \frac{\sigma^2}{SST_j(1-R_j^2)}$

→ We know the exact dist of $\hat{\beta}_j$



① Today, Relaxing

MLR4 $\xrightarrow{to}$ MLR4'

$E(u|X) = 0 \xrightarrow{to} Cov(u, X) = 0$

and ② Deleting MLR6 !!

③ MLR1 - MLR4': Consistency

$plim(\hat{\beta}_{j,n}) = \beta_j$ as $n \to \infty$