

15.4: Model Assumptions

→ Model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p + \varepsilon$$

→ Assumptions:

1. $E(\varepsilon) = 0$ for all ε .
2. $\text{Var}(\varepsilon) = \sigma^2$ (constant) for all ε .
3. All values of ε are independent.
4. All values of ε are Normal.

→ Remark:

Validating the Model Assumptions

- A1 } plots of residual against X_1, X_2, \dots, X_p .
- A2 } plot of residual against \hat{y} .
- A3 } plot(s) of standardized Residual.

A4 → Normal prob. plot.

From excel.

| | X_1 Residual plot | X_2 Residual plot |
|------|---------------------|---------------------|
| (A1) | ✓ | ✓ |
| (A2) | ✓ | ✓ |
| (A3) | ✓ | ✓ |
| (A4) | ✓ | Normal prob plots |

The Model Assumptions are satisfied.