

PREMISAS DEL TÉRMINO DE PERTURBACIÓN

$$y_i = \beta_1 + \beta_2 x_{2i} + \beta_3 x_{3i} + \dots + \beta_k x_{ki} + u_i$$

\downarrow
 v.a.

PARTE DETERMINISTA (INFO)

u_i (v.a.)
 PARTE ALEATORIA (NO INFO) ideal

- $E(u_i) = 0$

- $Var(u_i) = \sigma_u^2$

$$\left. \begin{array}{l} Var(u_1) = \sigma_u^2 \\ Var(u_2) = \sigma_u^2 \\ \vdots \\ Var(u_n) = \sigma_u^2 \end{array} \right\} \begin{array}{l} \text{Varianza constante} \\ \text{HOMOCEDEASTICIDAD} \end{array}$$

$$\left[\begin{array}{l} Var(u_i) = \sigma_i^2 \\ \text{HETEROCEDASTICIDAD} \end{array} \right\} \begin{array}{l} Var(u_1) = \sigma_1^2 \\ Var(u_2) = \sigma_2^2 \\ \vdots \\ Var(u_n) = \sigma_n^2 \end{array} \left. \right\} \begin{array}{l} \text{Varianzas} \\ \text{distinguidas} \end{array}$$

- $\left. \begin{array}{l} cov(u_i, u_j) = 0 \quad \forall i \neq j \\ corr(u_i, u_j) = 0 \quad \forall i \neq j \end{array} \right\} \text{NO-AUTOCORRELACIÓN}$

$$E(u_i u_j) = 0 \quad \forall i \neq j$$

$$\begin{array}{l} cov(u_1, u_3) = 0 \\ cov(u_1, u_1) \neq 0 \\ cov(u_i, u_{i-1}) = 0 \end{array}$$

• $u_i \sim \text{Normal}$

$E(u_i)$ $\text{Var}(u_i)$
 \downarrow \downarrow

$$u_i \sim N(0, \sigma_u^2)$$

$$U \sim N(0, \sigma_u^2 I_N)$$

PERTURBACIÓN ESFÉRICA → ausencia de información

MATRIZ DE VARIANZAS Y COVARIANZAS DEL TÉRMINO DE PERTURBACIÓN

$\text{Var}(U) = \sigma_u^2 I_N =$

$\text{Var}(u_i) = \sigma_u^2 \rightarrow \text{HOMOCEDEASTICIDAD}$

$\text{Cov}(u_i, u_j) = 0 \rightarrow \text{NO-CORRELACIÓN}$

PERTURBACIÓN ESFÉRICA $\left\{ \begin{array}{l} u_i \sim N(0, \sigma_u^2) \\ U \sim N(0, \sigma_u^2 I_N) \end{array} \right.$

$$\text{Var}(u) = \begin{pmatrix} \sigma_u^2 & 0 & \dots & 0 \\ 0 & \sigma_u^2 & \dots & 0 \\ \vdots & 0 & \ddots & \vdots \\ 0 & \dots & \dots & \sigma_u^2 \end{pmatrix} = \sigma_u^2 \underbrace{\begin{pmatrix} 1 & 0 & \dots & 0 \\ 0 & 1 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & \dots & \dots & 1 \end{pmatrix}}_{I_N} = \sigma_u^2 I_N$$

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