- Modelo econométrico – **Notación matricial**:

$$Y=\beta_0+\beta_1\cdot X_1+\beta_2\cdot X_2+\ldots+\beta_k\cdot X_k+u \quad \Leftrightarrow y=X\cdot\beta+u$$

- Criterio de **Mínimos cadraticos**: $\underset{\beta_0,\beta_1,\ldots,\beta_k}{minimo}\sum \hat{u}^2$

Forma matricial $\underset{\beta_0,\beta_1,\ldots,\beta_k}{minimo}\hat{u}^t\hat{u}=\underset{\beta_0,\beta_1,\ldots,\beta_k}{minimo}(y-\hat{y})^t(y-\hat{y})=\underset{\beta_0,\beta_1,\ldots,\beta_k}{minimo}(y-X\hat{\beta})^t(y-X\hat{\beta})$

- **Varianza dos parámetros**:

$$Var(\hat{\beta})=\sigma^2(X^t X)^{-1}$$

- **Estimación da varianza dos parámetros**:

$$\widehat{Var}(\hat{\beta})=\hat{\sigma}^2(X^t X)^{-1}$$

Distribucións dos estimadores (poboacional: Se coñecésemos σ^2**)**

u ~ N(0, $\sigma^2 I_n$) $\quad \hat{\beta}\sim N[\beta,\sigma^2(X^t X)^{-1}] \quad \hat{y}=X\hat{\beta}\sim N[X\beta, X\sigma^2(X^t X)^{-1}X^t]$

$$\frac{\hat{\sigma}^2(n-k-1)}{\sigma^2}\sim\chi^2_{n-k-1}$$

$\hat{\beta}_j$ e $\hat{\sigma}^2$ son independentes

Inferencia: contraste sobre un único coeficiente (Non coñecemos σ^2**)**

$$\frac{\hat{\beta}_j-\beta_j^0}{S_{\hat{\beta}_j}}\sim t_{n-k-1}=t_{\text{graos de liberdade}}$$

Inferencia: contraste significación global

$H_0:\beta_1=\beta_2=\ldots=\beta_k=0 \quad H_0$: modelo restrinxido (MR)

$H_1:\exists j\ \text{t.q.}\ \beta_j\neq 0 \quad H_1$: modelo sen restrinxir (MSR)

Bondade de axuste

$$\bar{R}^2=1-\frac{n-1}{n-k-1}(1-R^2) \qquad \bar{R}^2=1-\frac{SCR/(n-k-1)}{SCT/(n-1)}$$

Matrices X^tX e X^ty

$$X^t X=\begin{pmatrix} N & \sum_{i=1}^n x_{1i} & \sum_{i=1}^n x_{2i} & \sum_{i=1}^n x_{3i} \\ \sum_{i=1}^n x_{1i} & \sum_{i=1}^n x_{1i}^2 & \sum_{i=1}^n\sum_{i=1}^n x_{2i}x_{1j} & \sum_{i=1}^n\sum_{j=1}^n x_{3i}x_{1j} \\ \sum_{i=1}^n x_{2i} & \sum_{i=1}^n\sum_{j=1}^n x_{1i}x_{2j} & \sum_{i=1}^n x_{2i}^2 & \sum_{i=1}^n\sum_{j=1}^n x_{3i}x_{2j} \\ \sum_{i=1}^n x_{3i} & \sum_{i=1}^n\sum_{j=1}^n x_{3i}x_{2j} & \sum_{i=1}^n\sum_{j=1}^n x_{3i}x_{2j} & \sum_{i=1}^n x_{3i}^2 \end{pmatrix} \quad X^t y=\begin{pmatrix} \sum_{i=1}^n y_i \\ \sum_{i=1}^n\sum_{j=1}^n y_i x_{1j} \\ \sum_{i=1}^n\sum_{j=1}^n y_i x_{2j} \\ \sum_{i=1}^n\sum_{j=1}^n y_i x_{3j} \end{pmatrix}$$