

Zakon o prenosu varianc in kovarianc:

$$\Sigma_{yy} = \mathbf{J}\Sigma_{xx}\mathbf{J}^T \quad \Sigma_{yx} = \mathbf{J}\Sigma_{xx}$$

Zakon o prenosu varianc in kovarianc pri *posredni izravnavi po MNK*:

$$\begin{aligned} \mathbf{v} + \mathbf{B}\Delta &= \mathbf{f} \quad \mathbf{P} = \mathbf{Q}^{-1} = \sigma_0^2 \Sigma^{-1} \\ \mathbf{N} &= \mathbf{B}^T \mathbf{P} \mathbf{B} \quad \mathbf{t} = \mathbf{B}^T \mathbf{P} \mathbf{f} \\ \Delta &= \mathbf{N}^{-1} \mathbf{t} \quad \mathbf{v} = \mathbf{f} - \mathbf{B}\Delta \quad \hat{\mathbf{l}} = \mathbf{l} + \mathbf{v} \\ \mathbf{Q}_{\Delta\Delta} &= \mathbf{N}^{-1} \quad \mathbf{Q}_{\mathbf{v}\mathbf{v}} = \mathbf{Q} - \mathbf{B}\mathbf{Q}_{\Delta\Delta}\mathbf{B}^T \quad \mathbf{Q}_{\hat{\mathbf{l}}\hat{\mathbf{l}}} = \mathbf{Q} - \mathbf{Q}_{\mathbf{v}\mathbf{v}} \\ \hat{\sigma}_0^2 &= \frac{\mathbf{v}^T \mathbf{P} \mathbf{v}}{r} \end{aligned}$$

Zakon o prenosu varianc in kovarianc pri *pogojni izravnavi po MNK*:

$$\begin{aligned} \mathbf{A}\mathbf{v} &= \mathbf{f} \quad \mathbf{P} = \mathbf{Q}^{-1} = \sigma_0^2 \Sigma^{-1} \\ \mathbf{Q}_e &= \mathbf{A}\mathbf{Q}\mathbf{A}^T \quad \mathbf{P}_e = \mathbf{Q}_e^{-1} \quad \mathbf{k} = \mathbf{P}_e \mathbf{f} \\ \mathbf{v} &= \mathbf{Q}\mathbf{A}^T \mathbf{k} \quad \hat{\mathbf{l}} = \mathbf{l} + \mathbf{v} \\ \mathbf{Q}_{\mathbf{v}\mathbf{v}} &= \mathbf{Q}\mathbf{A}^T \mathbf{P}_e \mathbf{A}\mathbf{Q} \quad \mathbf{Q}_{\hat{\mathbf{l}}\hat{\mathbf{l}}} = \mathbf{Q} - \mathbf{Q}_{\mathbf{v}\mathbf{v}} \\ \hat{\sigma}_0^2 &= \frac{\mathbf{v}^T \mathbf{P} \mathbf{v}}{r} \end{aligned}$$

Potrebna natančnost geodetskih opazovanj:

$$\sigma_{x_i} = \frac{\sigma_y}{\left| \frac{\partial y}{\partial x_i} \right| \sqrt{n}} \quad \sigma_{x_i} = \frac{\sqrt{\sigma_y^2 - \sum_{j=1}^k \left(\frac{\partial y}{\partial x_j} \right)^2 \sigma_{x_j}^2}}{\left| \frac{\partial y}{\partial x_i} \right| \sqrt{n-k}} \quad (i = k+1, k+2, \dots, n)$$

Elipse pogreškov:

$$\lambda_{1,2} = \frac{\sigma_y^2 + \sigma_x^2}{2} \pm \sqrt{\frac{(\sigma_y^2 - \sigma_x^2)^2}{4} + \sigma_{yx}^2} \quad \tan(2\theta) = \frac{2\sigma_{yx}}{\sigma_y^2 - \sigma_x^2}$$

Splošni model izravnave po MNK:

$$\begin{aligned} \mathbf{A}\mathbf{v} + \mathbf{B}\boldsymbol{\Delta} &= \mathbf{f} & \mathbf{P} &= \mathbf{Q}^{-1} = \sigma_0^2 \boldsymbol{\Sigma}^{-1} \\ \mathbf{Q}_e &= \mathbf{A}\mathbf{Q}\mathbf{A}^T & \mathbf{P}_e &= \mathbf{Q}_e^{-1} \\ \mathbf{N} &= \mathbf{B}^T \mathbf{P}_e \mathbf{B} & \mathbf{t} &= \mathbf{B}^T \mathbf{P}_e \mathbf{f} \\ \boldsymbol{\Delta} &= \mathbf{N}^{-1} \mathbf{t} & \mathbf{v} &= \mathbf{Q}\mathbf{A}^T \mathbf{P}_e (\mathbf{f} - \mathbf{B}\boldsymbol{\Delta}) & \hat{\mathbf{I}} &= \mathbf{I} + \mathbf{v} \\ \mathbf{Q}_{\Delta\Delta} &= \mathbf{N}^{-1} & \mathbf{Q}_{\mathbf{v}\mathbf{v}} &= \mathbf{Q}\mathbf{A}^T \mathbf{P}_e (\mathbf{I} - \mathbf{B}\mathbf{Q}_{\Delta\Delta} \mathbf{B}^T \mathbf{P}_e) \mathbf{A}\mathbf{Q} & \mathbf{Q}_{\hat{\mathbf{I}}\hat{\mathbf{I}}} &= \mathbf{Q} - \mathbf{Q}_{\mathbf{v}\mathbf{v}} \\ \hat{\sigma}_0^2 &= \frac{\mathbf{v}^T \mathbf{P}\mathbf{v}}{r} \end{aligned}$$

Globalni test modela:

$$\frac{\chi_{\alpha/2, r}^2}{r} < \frac{\hat{\sigma}_0^2}{\sigma_0^2} < \frac{\chi_{1-\alpha/2, r}^2}{r}$$

Iskanje grobih pogreškov:

$$|\omega_i| = \left| \frac{v_i}{\sigma_0 \sqrt{q_{v_i v_i}}} \right| < N_{\alpha/2} \qquad |T_i| = \left| \frac{v_i}{\hat{\sigma}_0 \sqrt{q_{v_i v_i}}} \right| < \tau_{\alpha/2, r}$$