Gestion de Portefeuille

Exo Risk Parity

Version: 09 mars 2022

Risk parity portfolio

To set all risk contributions identical, minimize the squared difference between the contributions of pairs of assets.

$$\min_w \sum_i (CR_i - CR_{i-1})^2$$

```
sigma <- c(.1, .2, .3)
rho <- matrix(c(1,.8, .7,.8, 1, .6, .7, .6, 1), nrow = 3)
Sigma <- diag(sigma) %*% rho %*% diag(sigma)
```

Using Newton's method

Risk parity condition:

$$w_i \frac{\partial \sigma_P}{\partial w_i} = w_j \frac{\partial \sigma_P}{\partial w_j} = \lambda \quad \forall\, i, j$$

Compute the weights by solving a set of non-linear equations. Use package nleqslv.