Risk Budgeting

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Risk Budgeting

$$\sigma(w) = w^T \Sigma w$$

Contribution au risque de l'actif i:

$$\mathrm{RC}_i = \frac{w_i (\Sigma w)_i}{\sqrt{w^T \Sigma w}}$$

Risk Parity & Budgeting

Parity:

$$\mathrm{RC}_i = \frac{1}{N}\sigma(w)$$

Bugeting:

$$\mathrm{RC}_i = b_i\sigma(w)$$

Cas Paticulier: Σ diagonal

$$\Omega = \sqrt{\text{diag}(\Sigma)}$$

$$w = \frac{\Omega^{-1}}{1^T \Omega^{-1}}$$

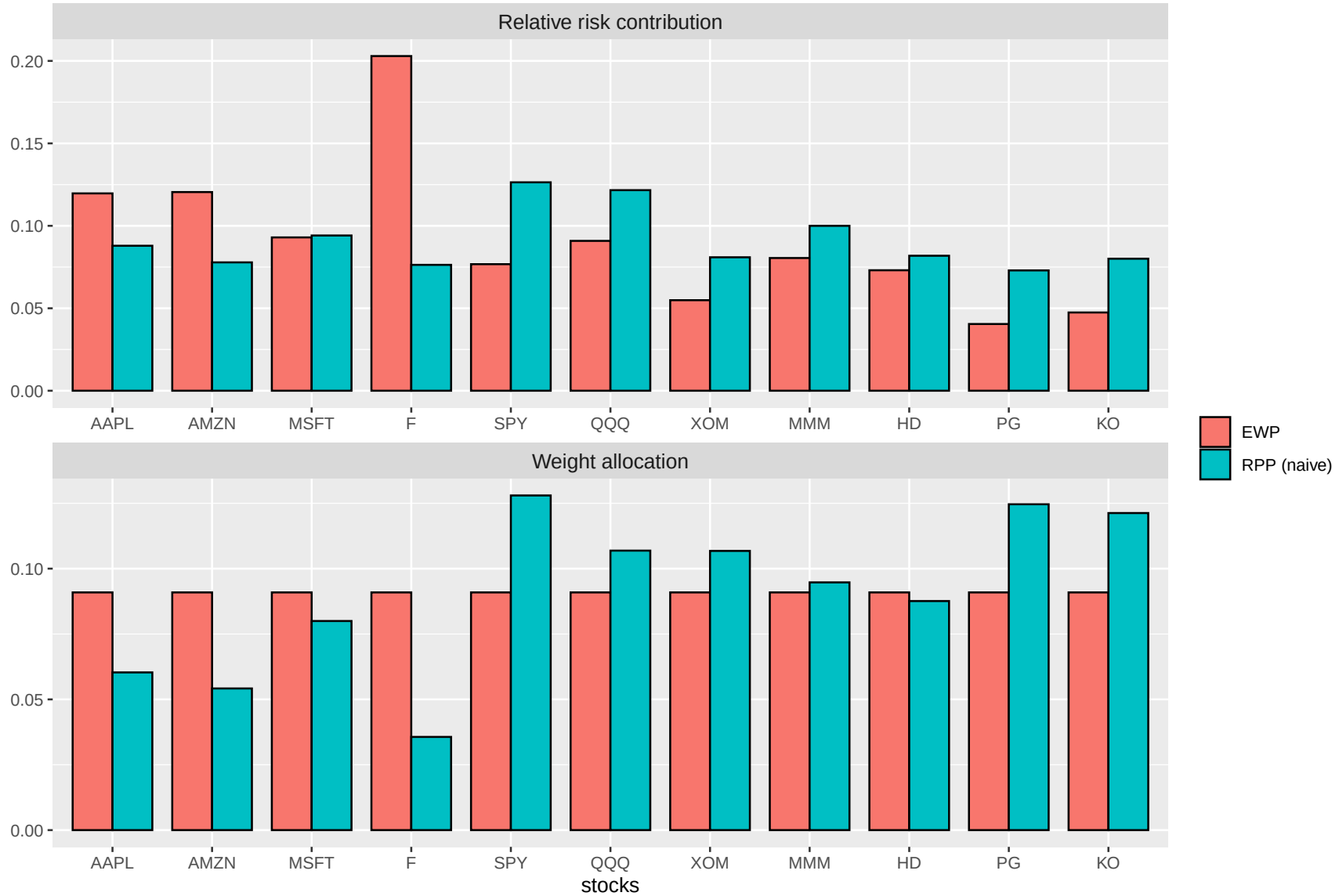
Risk Parity & Budgeting: Exemple.

```
Sigma <- cov(monthly.ret)
mu <- colMeans(monthly.ret)
rpp_naive <- riskParityPortfolio(Sigma, formulation = "diag
rpp_vanilla <- riskParityPortfolio(Sigma)
rpp_mu <- riskParityPortfolio(Sigma, formulation = "rc-over
                              mu = mu, lmd_mu = 1e-3,
                              w_ub = 0.16)

w_all <- cbind("EWP"           = rep(1/nrow(Sigma), nrow(Si
               "RPP (naive)"   = rpp_naive$w)
```

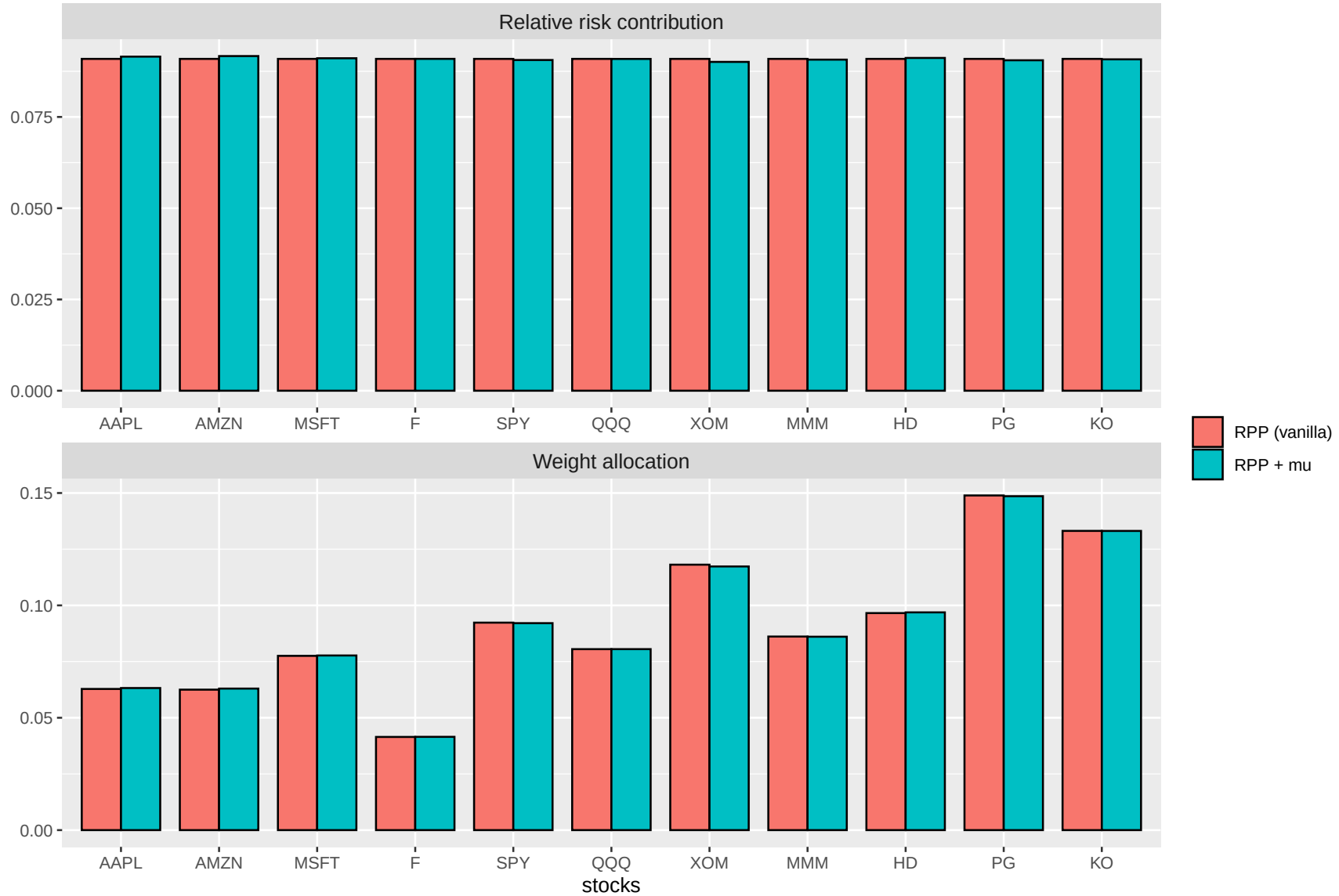
Risk Budgeting

Portfolio capital and risk distribution



Risk Budgeting

Portfolio capital and risk distribution



Exercice

Utiliser le package “riskParityPortfolio” et le dataset “monthly returns.”

A partir de l’exemple: “A pratical example using FAANG price data,” comparer par un backtest les performances et la composition d’un portefeuille tangent et d’un portefeuille “risk parity.”

Ajouter des contraintes au portefeuille tangent:

- Poids $<= 20\%$
- Secteur Technologie $<= 30\%$

https://cran.r-project.org/web/packages/riskParityPortfolio/vignettes/RiskParityPortfolio.html