

Robust Portfolio Allocation with Risk Contribution Restrictions

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Considered Objective Function

$$w^* = \underset{\substack{w > 0 \\ \langle 1, w \rangle = 1}}{\operatorname{argmin}} \mathcal{R}(w) + \delta(\mathcal{R}_S(w) - \pi\mathcal{R}(w))^2 + \lambda \left\langle w_0, \ln \left(\frac{w_0}{w} \right) \right\rangle$$

$\mathcal{R}_S(w) - \pi\mathcal{R}(w)$

→

Assets	Market contrib	Idiosyncratic contrib	Total contrib
1			$R_1(w)$
⋮			⋮
i	$R_{is}(w)$	$R_{iu}(w)$	$R_i(w)$
⋮			⋮
n			$R_n(w)$
Total	$R_S(w)$	$R_U(w)$	$R(w)$

↓ $\left\langle w_0, \ln \left(\frac{w_0}{w} \right) \right\rangle$

Discussion

- Pros
- Cons
- Context

$$w \odot \partial \mathcal{R}(w) \propto \pi$$