

# KOHERENCE VaR a CVaR (1)

$$\text{VaR}_\alpha(X) = \inf \{ l \in \mathbb{R} : P(X > l) \leq 1 - \alpha \}$$

TRANSLATION EQUIVARIANCE (EKVIVARIANCE VŮČI POSUNUTÍ)

$$\begin{aligned} \text{VaR}_\alpha(X + c) &= \inf \{ l \in \mathbb{R} : P(X + c > l) \leq 1 - \alpha \} \\ &\stackrel{k := l - c}{=} \inf \{ k + c : P(X > k) \leq 1 - \alpha \} \\ &= c + \inf \{ k : P(X > k) \leq 1 - \alpha \} \\ &= c + \text{VaR}_\alpha(X) \quad \checkmark \end{aligned}$$

POSITIVE HOMOGENEITY (POZITIVNÍ HOMOGENITA)

$$\begin{aligned} \text{VaR}_\alpha(0) &= 0 \quad \checkmark \\ \text{VaR}_\alpha(nX) &= \inf_{k = l/n} \{ l \in \mathbb{R} : P(nX > l) \leq 1 - \alpha \} \\ &= \inf \{ nk : P(X > k) \leq 1 - \alpha \} \\ &= n \cdot \inf \{ k : P(X > k) \leq 1 - \alpha \} \\ &= n \cdot \text{VaR}_\alpha(X) \quad \checkmark \end{aligned}$$

MONOTONICITY (MONOTONIE)

necht  $Y \geq X$  s.j. pak  $P(Y > l) \geq P(X > l) \quad \forall l$

$$\begin{aligned} \text{VaR}_\alpha(Y) &= \inf \{ l : P(Y > l) \leq 1 - \alpha \} \\ &\geq \inf \{ l : P(X > l) \leq 1 - \alpha \} = \text{VaR}_\alpha(X) \end{aligned}$$

protože se zvětšila množina přípustných  $l$ .