KOHERENCE VaR a CVaR

③

DUALITA V LP

$$= \max_{y_1,y_2,y_3} \; 4y_1 + 3y_2 + 2y_3$$

$$\text{s.t.} \quad y_1 + y_2 + y_3 = 1$$

$$y_1 \leq \frac{3}{5}$$

$$y_2 \leq \frac{3}{5}$$

$$y_3 \leq 18{,}8$$

$$y_1, y_2, y_3 \geq 0$$

VIDÍME, ŽE OPTIMÁLNÍ ŘEŠENÍ JE:

$$y_1^* = \frac{3}{5}, \quad y_2^* = \frac{2}{5}, \quad y_3^* = 0$$

A TEDY: $CVaR_\alpha(X) = 4 \cdot \frac{3}{5} + 3 \cdot \frac{2}{5} = \frac{18}{5}$

ANALOGICKY: $CVaR_\alpha(Y) = \frac{18}{5}$

A TEĎ $CVaR_\alpha(X+Y)$:

$$CVaR_{0{,}95}(X+Y) = \min \; a + \frac{1}{0{,}05}\left[0{,}06 z_1 + 0{,}94 z_2\right]$$

$$\text{s.t.} \quad z_1 \geq 7 - a \; ; \; z_2 \geq 4 - a$$

$$z_1 \geq 0 \; ; \; z_2 \geq 0$$

$$= \max \; 7y_1 + 4y_2$$

$$\text{s.t.} \quad y_1 + y_2 = 1$$

$$y_1 \leq \frac{6}{5}$$

$$y_2 \leq 18{,}8$$

$$= 7$$

T. J. $CVaR_\alpha(X+Y) = 7 \leq \frac{18}{5} + \frac{18}{5} = CVaR_\alpha(X) + CVaR_\alpha(Y)$