(1) $y_m^- = 3\% - 0{,}05\% = 2{,}95\%$

$y_m^+ = 3\% + 0{,}05\% = 3{,}05\%$

$P_0^- = 105{,}804232$

$P_0^+ = 105{,}510494$

$$\text{MOD. DUR} = \frac{105{,}804232 - 105{,}510494}{2 \cdot 0{,}0005 \cdot 105{,}657223} = \underline{2{,}7801}$$

(2)

$$\text{MAC. DUR} = 2{,}7801 \cdot (1 + 0{,}03)$$

$$\text{MAC. DUR} = \underline{2{,}8635}$$

(3)

$$\text{EF. DURACE} = \frac{510{,}1 - 373{,}6}{2 \cdot 455{,}4 \cdot 0{,}01} = 14{,}987 = \underline{14{,}99}$$

(4) $P_0 = 98{,}722$

$P_0^- = 98{,}782$

$P_0^+ = 98{,}669$

$10bp = 0{,}1\% \Rightarrow 0{,}001$

$$\text{KONVEXITA} = \frac{P_0^+ + P_0^- - 2 \cdot P_0}{(\Delta \text{YIELD})^2 \cdot P_0} = \frac{98{,}669 + 98{,}782 - 2 \cdot 98{,}722}{(0{,}001)^2 \cdot 98{,}722}$$

$$\text{KONVEXITA} = \underline{10{,}9061}$$

(5) DURACE = 7,020

KONVEXITA = 65,180

Δ YIELD = − 25 bp. ⇒ − 0,25 % → − 0,0025

$$\Delta P = - 7{,}020 \cdot (-0{,}0025) + 0{,}5 \cdot 65{,}180 \cdot (-0{,}0025)^2$$

$$\Delta P = 0{,}01755 + 0{,}000020387$$

$$\Delta P = + 1{,}755\,\% + 0{,}0020387\,\% = 1{,}7570387\,\% = 1{,}76\,\%$$

(6) DURACE = 7,140

KONVEXITA = 66,20

Δ YIELD = 50 bp. ⇒ 0,5 % ⇒ 0,005

$$\Delta P = - 7{,}140 \cdot (0{,}005)^2 + 0{,}5 \cdot 66{,}2 \cdot 0{,}005^2$$

$$\Delta P = - 0{,}0357 + 0{,}0008275$$

$$\Delta P = - 3{,}57\,\% + 0{,}08275\,\%$$

$$\Delta P = - 3{,}48743\,\% = - 3{,}49\,\%$$

(7) DURATION GAP = [illegible] ⇒ 0 ⇒ PŘEVLÁDÁ RIZIKO

= MAC. DURACE − INV. HORIZ. TRŽNÍ CENY

= 11,470 · (1 + 0,06) − 8 = 4,1582 LET

DURATION GAP < 0 PŘEVLÁDÁ REINVESTIČNÍ RIZIKO

(8) EXCEL