

HW #2 - SOLUTIONS

①

$$(1) d_1 = \frac{[\ln(80/80) + (.08 + (.3)^2/2)(.5)]}{.3\sqrt{.5}} = 0.2946$$

$$d_2 = d_1 - .3\sqrt{.5} = 0.0825$$

$$\Rightarrow N(d_1) = 0.6158 \quad N(d_2) = 0.5329$$

$$\Rightarrow V_c = C = 80(0.6158) - 80 \cdot e^{-.08(.5)}(0.5329) = \underline{\underline{8.30}}$$

$$(2) P = 8.30 + 80 \cdot e^{-.04} - 80 = \underline{\underline{5.16}}$$

$$(3) \text{MODIFIED DURATION} = \underline{\underline{2.65}}$$

$$(4) \text{CONVEXITY} = \underline{\underline{9.78}}$$

SEE SPREADSHEET
SOLUTION FILE.

$$(5) \text{TRUE PRICE @ 7\%} = 1,000.00$$

$$\text{ESTIMATE: CHANGE} = -2.6576(.01) + \frac{1}{2}(9.7835)(.01)^2 = -.026027$$

$$\text{EST. PRICE} = 1026.73(1 - .0260) = 1,000.01$$

$$\text{DIFF.} = \underline{\underline{0.01}}$$

$$(6) \text{MODIFIED DURATION} = \underline{\underline{10.43}}$$

$$(7) \text{CONVEXITY} = \underline{\underline{187.81}}$$

SEE SPREADSHEET
SOLUTION FILE.

$$(8) \text{TRUE PRICE @ 8\%} = 1,000.00$$

$$\text{ESTIMATE: CHANGE} = -[10.43(-.01)] + [0.5(187.81)(.01)^2] = .113737$$

$$\text{EST. PRICE} = 891.26(1 + .113737) = 999.32$$

$$\text{DIFF.} = \underline{\underline{0.68}}$$

$$(9) \frac{79}{1000} = \underline{\underline{0.079}} \text{ OR } \underline{\underline{7.9\%}}$$

$$(10) \frac{44}{1000} = \underline{\underline{0.044}} \text{ OR } \underline{\underline{4.4\%}}$$