

- 1) A 7%, 30-year bond has a par value of \$1,000 and a call price of \$1,030. It is callable in 10 years. The bond is currently selling for \$1,060. Calculate the current yield, yield-to-maturity, and yield-to-call of this bond.

current yield = $\frac{\text{annual interest}}{\text{market price}} = \frac{\$70}{\$1060} = 0.06604 \approx 6.604\%$ current yield

yield to maturity = $\frac{\text{Annual interest} + \frac{\text{Par Value} - \text{Market Value}}{\text{Years to Maturity}}}{\frac{\text{Par Value} + \text{Market Value}}{2}} = \frac{\$70 + \frac{1000 - 1060}{30}}{\frac{1000 + 1060}{2}} = \frac{70 + (-2)}{1030} = \frac{68}{1030} = 0.06602 \approx 6.602\%$ yield to maturity

yield to call = $\frac{\text{Annual interest} + \frac{\text{Call Price} - \text{Market Price}}{\text{Years to Call}}}{\frac{\text{Call Price} + \text{Market Price}}{2}} = \frac{\$70 + \frac{1030 - 1060}{10}}{\frac{1030 + 1060}{2}} = \frac{70 + (-3)}{1045} = \frac{67}{1045} = 0.06411 \approx 6.41\%$ yield to call

- 2) A married couple from California is in the 35% Federal tax bracket and the 11% California tax bracket. They are considering a 6% Arizona municipal bond (Federal tax-free), a 5 1/2% California bond (double tax-free) or an 8% corporate bond (fully-taxable). Which bond offers the highest after-tax interest rate?

8% corporate bond (0.08)
6% Arizona bond (0.06)
Taxable equivalent yield (Fed only) = $\frac{\text{muni bond yield}}{1 - \text{Fed tax bracket}} = \frac{0.06}{1 - 0.35} = \frac{0.06}{0.65} = 0.09231 \approx 9.23\%$ Arizona bond

5 1/2% California bond (0.055)
Taxable equivalent yield (Fed + Calif) = $\frac{\text{muni bond yield}}{1 - [\text{Fed bracket} + (\text{State bracket} * (1 - \text{Fed bracket}))]} = \frac{0.055}{1 - [0.35 + (0.11 * (1 - 0.35))]} = \frac{0.055}{1 - [0.35 + (0.11 * 0.65)]} = \frac{0.055}{1 - [0.35 + 0.0715]} = \frac{0.055}{1 - 0.4215} = \frac{0.055}{0.5785} = 0.09507 \approx 9.51\%$ Calif
Calif is highest taxable equivalent yield

- 3) Using annual compounding, find the prices for the following bonds:

a) 8%, 20-year bond priced to yield 5%
b) 6%, 10-year bond priced to yield 9%
bond price = Present value (interest income) + Present value (principal repayment)
= $\$80 * 12.462 + 1000 * 0.377$
= $\$996.96 + \377
= $\$1373.96$
premium bond
20-year 8% bond priced to yield 5%

6% 10 year 9% pricing
bond price = present value (interest income) + present value (principal repayment)
= $\$60 * 6.418 + 1000 * 0.422$
= $\$385.08 + \422
= $\$807.08$
discount bond
10-year 6% bond priced to yield 9%