Homework 2 Solution. Quantitative Methods for fixed Income Securities

CHAPTER 2-4 (Tuckman)

4.1 There are 89 days between February 15, 2001, and May 15, 2001. There are 181 days between February 15, 2001, and August 15, 2001. Therefore, the accrued interest on this Treasury bond is

$$\frac{89}{181} \times \frac{5.00}{2} = 1.229282$$

And the invoice price on $100,000 is

$$\$100,000 \times \left(96 - 23\tfrac{1}{2} + 1.229282\right)/100 = \$97,963.66$$

2.2 The return must satisfy this equation:

$$\$100 \times \left(1 + r/2\right)^6 = \$120$$

Solving, *r*=6.1707%.

2.3 Use equation (2.10) of the text for *t* equal to .5, 1, and 1.5.

$$\hat{r}(t) = 2\left(\frac{1}{d(t)^{1/2t}} - 1\right)$$

The resulting spot rates are 3.822%, 3.997%, and 4.230%, respectively.

3.2 4.8964%.

3.7 a. The value of the annuity over 25 years is

$$\frac{\$25,000}{.03} \times \left[1 - \left(\frac{1}{1.03}\right)^{50}\right] = \$643,244$$

but only

$$\frac{\$25,000}{.03} \times \left[1 - \left(\frac{1}{1.03}\right)^{30}\right] = \$490,011$$

over 15 years. So the woman should buy the annuity at a price of $575,000 if she expects to live 25 years but not if she expects to live only 15 years.