Midterm for Math 361

Quantitative Methods for Fixed-Income Securities

April 14, 2008

Problems (with credits indicated in parentheses):

1 Give the definitions of

1.1 (2) a spot-rate curve;

1.2 (2) a forward-rate curve; and

1.3 (2) a par yield curve.

Also,

1.4 (2) express a coupon bond price in terms of its yield;

1.5 (2) express a coupon bond price in terms of spot rates;

1.6 (2) express a coupon bond price in terms of forward rates;

1.7 (2) express a forward rate in terms of spot rates;

1.8 (2) express a spot rate in terms of forward rates;

1.9 (2) express a par yield in terms of discount bonds; and

1.10 (2) express a par yield in terms of forward rates.

2 (4) With the coupon bond of 5.5s of July 14, 2011, explain how to calculate the yield of a bond today, April 14, 2008. Suppose the price today is $110, write down the equation for the bond yield (You don't need to solve for the bond yield).

3 Suppose that both 5.5s of April 14, 2011 and 5s of April 14, 2009 are par bonds. Do the following:

3.1 (4) Calculate the DV01s of the two bonds;

3.2 (2) Calculate the modified durations of the two bonds;

3.3 (2) Suppose that you long one unit of 5.5s of April 14, 2011, calculate the units of 5s of April 14, 2009 that you need to *short sell* to neutralize duration.

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