

Homework Assignment No. 12, Math 5760/6890, due Nov. 27

1. The current US treasury yield curve has an inverted shape, which implies that longer maturities have lower yields compared to short maturities. For example, the 6-month yield is 4.93%, the 2-year yield is 4.76%, and the 10-year yield is 4.59%. Let's assume these are all zero-coupon bills or bonds and continuously compounded. Find the prices of these treasury bills or bonds, assuming a face value \$100. Now suppose you want to price the 1-year treasury bond by interpolation using the given information about the 6-month, 2-year and 10-year treasury notes. Should you interpolate the yields, or the prices? Compute the difference and determine whether one is always above the other or the other way around, by studying the convexity behavior of the price-yield relationship and the shape of the yield curve.
2. The term structure of interest rates is downward-sloping (inverted). Put the following in order of magnitude:
 - (a) The 5-year zero rate (the yield on a zero-coupon bond);
 - (b) The yield on a 5-year coupon-bearing bond;
 - (c) The forward rate corresponding to the period between 5 and 5.25 years in the future.

What is the answer to this question when the term structure of the interest rates is upward-sloping?