Assignment 1: Answers
(September 24, 1998)

1. Treasuries ...

<table>
<thead>
<tr>
<th>Maturity (Yrs)</th>
<th>Disc Factor</th>
<th>Spot Rate (%)</th>
<th>Forward Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a,b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.9756</td>
<td>5.001</td>
<td>5.001</td>
</tr>
<tr>
<td>1.0</td>
<td>0.9246</td>
<td>8.000</td>
<td>11.043</td>
</tr>
<tr>
<td>1.5</td>
<td>0.8763</td>
<td>9.000</td>
<td>11.015</td>
</tr>
</tbody>
</table>

By way of example, the first discount factor is \(d_1 = 98.536/101\) (a claim to 101 in one period costs 98.536).

(c) Use the par yield formula: 7.941%.

(d) The idea is to find quantities of A and B that have the same cash flows as a two-period zero:

\[
0 = x_A \times 101 + x_B \times 2 \\
100 = x_B \times 102.
\]

The answer is \(x_A = -0.019\) (a short position) and \(x_B = 0.980\). What this means is that you buy a little less than one unit of B (since the second-period cash flow of 102 is more than 100), and short enough of A to offset the first-period coupon.

(e) Yield-to-maturity: 5.001 for A, 7.969 for B, and 8.938 for C (all %)

2. Disney (annual coupon and compounding): \(n = 2\), (a) \(u = 70\), (b) Accrued Interest = 1.677, (c) Invoice Price = 109.344, and (d) Yield = 4.116%.

3. Wal-Mart (traditional semi-annual US corporate): \(n = 51\), (a) \(u = 136\), (b) Accrued Interest = 2.550, (c) Invoice Price = 109.102, and (d) Yield = 6.230%.

4. Mexico (a eurobond with semi-annual payments): \(n = 56\), (a) \(u = 108\), (b) Accrued Interest = 3.450, (c) Invoice Price = 92.044, and (d) Yield = 13.026%.

Note that Mexican debt (rated Ba2) sells at a steep discount (higher yield) to comparable Wal-Mart debt (rated Aa2).