Money and Banking  
Economics 301/01  
Fall 2006  
Problem Set 1

Directions: Use this handout for your final answers only. Your answers must be legible and neatly presented in order to receive full credit. Your answers should first show the correct formula, indicating what the notation means. In doing these exercises, you may use a calculator; but you must show all the steps. Be careful to show only economically significant and sensible results. Do not show too many digits or too few (i.e. 4.234836 or 4 percent). Only show as many digits as matter economically.

1. You have a choice of investing $1,000 in two different certificates of deposit. Bank of America offers a CD for 2 years, at 4.9 percent interest rate compounded quarterly, while the Chase-Morgan Bank offers a 2 year CD at 4.3 percent, compounded daily. Which CD would you prefer? Show your work. (15 points)

2. If a million dollar (face value) U.S. Treasury strip has a maturity of 7 years and a price of $589,899, what is its yield to maturity? (10 points)
3. If upon arrival at Rutgers University at age 18 you needed to pay all your tuition of $28,000 up front, how much would your parents need to invest when you were born to attain this sum? Assume that they can invest in a fund that yields 5.2 percent annually. Also assume that there will be no inflation. If they planned for your sister to go to Harvard at a cost of $160,000, and they invested the same amount that they invested for you, what would be the required return to yield $160,000 when she was ready for college? (15 points)

4. If the price of a $100,000 face value U.S. Treasury bill is $98,327 and it has 79 days to maturity, what is its yield to maturity? What is its yield on a discount basis? (10 points)

5. If the annual coupon on a British consol is 5,000 pounds sterling and its market price is 32,222 pounds, what is yield? (10 points)
6. You want to buy a $30,000 new car. You have saved up $4,000 and need to borrow $26,000. Write down the formula for a 4 year car loan with the payments made annually. Write down the formula where the payments are made monthly. You do not need to write down every payment but use “…” where needed. Find an auto loan calculator on the internet. Find out what the monthly payment for this car loan would be at 4.5 percent and 7.5 percent. (15 points)

7. On September 1, 2005 you bought a coupon bond for $695. During the year, you received a coupon of $25. On September 1, 2006, you sold the bond for $703. What was your total rate of return? If there was inflation of 5.5 percent of the year, what was your real return? (10 points.)
8. You have the following data

<table>
<thead>
<tr>
<th>Year</th>
<th>10 Yr Bond Rate</th>
<th>Inflation Rate</th>
<th>Real Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>5.09</td>
<td>2.54</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>4.03</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>4.01</td>
<td>3.39</td>
<td></td>
</tr>
</tbody>
</table>

Calculate the real rate and fill in the table.

(3 points)

9. Using the information above, if a bottle of Coke cost $2.39 in December 2002 and $2.69 in December 2004, did the real price rise? Show your work. (5 points)

10. If the September 2006, 10 year rate U.S. Bond rate is 5.6 percent and the best forecast of inflation over the next 12 months is 3.5 percent, what is the expected real rate of interest? Suppose the actual rate of inflation is 5.2 percent, what is the actual real rate of interest for 2006? If your tax rate is 28 percent, what are the expected and actual after-tax real rates of interest? (7 points)