Problem Set II

Answers

Problems from the textbook:

Chapter 5:

1.  (a) Less, because your wealth has declined; (b) more, because its relative expected return has risen; (c) less, because it has become less liquid relative to bonds; (d) less, because its expected return has fallen relative to gold; (e) more, because it has become less risky relative to bonds.

7. In the loanable funds framework, when the economy booms, the demand for bonds increases: the public’s income and wealth rises while the supply of bonds also increases, because firms have more attractive investment opportunities. Both the supply and demand curves (B_d and B_s) shift to the right, but as is indicated in the text, the demand curve probably shifts less than the supply curve so the equilibrium interest rate rises. Similarly, when the economy enters a recession, both the supply and demand curves shift to the left, but the demand curve shifts less than the supply curve so that the interest rate falls. The conclusion is that interest rates rise during booms and fall during recessions: that is, interest rates are procyclical. The same answer is found with the liquidity preference framework. When the economy booms, the demand for money increases: people need more money to carry out an increased amount of transactions and also because their wealth has risen. The demand curve, M_d, thus shifts to the right, raising the equilibrium interest rate. When the economy enters a recession, the demand for money falls and the demand curve shifts to the left, lowering the equilibrium interest rate. Again, interest rates are seen to be procyclical.

12. Interest rates might rise. The large federal deficits require the Treasury to issue more bonds; thus the supply of bonds increases. The supply curve, B_s, shifts to the right and the equilibrium interest rate rises. Some economists believe that when the Treasury issues more bonds, the demand for bonds increases because the issue of bonds increases the public’s wealth. In this case, the demand curve, B_d, also shifts to the right, and it is no longer clear that the equilibrium interest rate will rise. Thus there is some ambiguity in the answer to this question.

14. The price level effect has its maximum impact by the end of the first year, and since the price level does not fall further, interest rates will not fall further as a result of a price level effect. On the other hand, expected inflation returns to zero in the second year, so that the expected inflation effect returns to zero. One factor producing lower interest rates thus disappears, so, in the second year, interest rates may rise somewhat from their low point at the end of the second year.

16. If the public believes the president’s program will be successful, interest rates will fall. The president’s announcement will lower expected inflation so that the expected return on goods decreases relative to bonds. The demand for bonds increases and the demand curve, B_d, shifts to the right. For a given nominal interest rate, the lower expected inflation means that the real interest rate has risen, raising the cost of borrowing so that the supply of bonds falls. The resulting leftward shift of the supply curve, B_s, and the rightward shift of the demand curve, B_d, causes the equilibrium interest rate to fall.
18. Interest rates will rise. The expected increase in stock prices raises the expected return on stocks relative to bonds and so the demand for bonds falls. The demand curve, $B_d$, shifts to the left and the equilibrium interest rate rises.

20. The slower rate of money growth will lead to a liquidity effect, which raises interest rates, while the lower price level, income, and inflation rates in the future will tend to lower interest rates. There are three possible scenarios for what will happen: (a) if the liquidity effect is larger than the other effects, then interest rates will rise; (b) if the liquidity effect is smaller than the other effects and expected inflation adjusts slowly, then interest rates will rise at first but will eventually fall below their initial level; and (c) if the liquidity effect is smaller than the expected inflation effect and there is rapid adjustment of expected inflation, then interest rates will immediately fall.

Chapter 6:

1. The bond with a C rating should have a higher interest rate because it has a higher default risk, which reduces its demand and raises its interest rate relative to that on the Baa bond.

3. During business cycle booms, fewer corporations go bankrupt and there is less default risk on corporate bonds, which lowers their risk premium. Similarly, during recessions, default risk on corporate bonds increases and their risk premium increases. The risk premium on corporate bonds is thus anticyclical, rising during recessions and falling during booms.

5. If yield curves on average were flat, this would suggest that the risk premium on long-term relative to short-term bonds would equal zero and we would be more willing to accept the expectations hypothesis.

7. (a) The yield to maturity would be 5 percent for a one-year bond, 5.5 percent for a two-year bond, 6 percent for a three-year bond, 6 percent for a four-year bond, and 5.8 percent for a five-year bond; (b) the yield to maturity would be 5 percent for a one-year bond, 4.5 percent for a two-year bond, 4 percent for a three-year bond, 4 percent for a four-year bond, and 4.2 percent for a five-year bond. The upward- and then downward-sloping yield curve in (a) would tend to be even more upward sloping if people preferred short-term bonds over long-term bonds because long-term bonds would then have a positive risk premium. The downward- and then upward-sloping yield curve in (b) also would tend to be more upward sloping because of the positive risk premium for long-term bonds.

9. The steep upward-sloping yield curve at shorter maturities suggests that short-term interest rates are expected to rise moderately in the near future because the initial, steep upward slope indicates that the average of expected short-term interest rates in the near future are above the current short-term interest rate. The downward slope for longer maturities indicates that short-term interest rates are eventually expected to fall sharply. With a positive risk premium on long-term bonds, as in the preferred habitat theory, a downward slope of the yield curve occurs only if the average of expected short-term interest rates is declining, which occurs only if short-term interest rates far into the future are falling. Since interest rates and expected inflation move together, the yield curve suggests that the market expects inflation to rise moderately in the near future but fall later on.

11. The government guarantee will reduce the default risk on corporate bonds, making them more desirable relative to Treasury securities. The increased demand for corporate bonds
and decreased demand for Treasury securities will lower interest rates on corporate bonds and raise them on Treasury bonds.

13. Abolishing the tax-exempt feature of municipal bonds would make them less desirable relative to Treasury bonds. The resulting decline in the demand for municipal bonds and increase in demand for Treasury bonds would raise the interest rates on municipal bonds, while the interest rates on Treasury bonds would fall.

15. The slope of the yield curve would fall because the drop in expected future short rates means that the average of expected future short rates falls so that the long rate falls.

Chapter 7:

3. \[
\frac{1}{1.15} + \frac{20}{1.15} = 18.26
\]

7. Although Joe’s expectations are typically quite accurate, they could still be improved by his taking account of a snowfall in his forecasts. Since his expectations could be improved, they are not optimal and hence are not rational expectations.

9. True, as an approximation. If large changes in a stock price could be predicted, then the optimal forecast of the stock return would not equal the equilibrium return for that stock. In this case, there would be unexploited profit opportunities in the market and expectations would not be rational. Very small changes in stock prices could be predictable, however, and the optimal forecast of returns would equal the equilibrium return. In this case, an unexploited profit opportunity would not exist.

11. The stock price will rise. Even though the company is suffering a loss, the price of the stock reflects an even larger expected loss. When the loss is less than expected, efficient markets theory then indicates that the stock price will rise.

15. False. All that is required for the market to be efficient so that prices reflect information on the monetary aggregates is that some market participants eliminate unexploited profit opportunities. Not everyone in a market has to be knowledgeable for the market to be efficient.

19. No, because this expected change in the value of the dollar would imply that there is a huge unexploited profit opportunity (over a 100% expected return at an annual rate). Since rational expectations rules out unexploited profit opportunities, such a big expected change in the exchange rate could not exist.

Chapter 19:

1. You are more likely to drink California wine because the franc appreciation makes French wine relatively more expensive than California wine.

5. In the long run, the fall in the demand for a country’s exports leads to a depreciation of its currency, but the higher tariffs lead to an appreciation. Therefore, the effect on the exchange rate is uncertain.

7. The dollar will appreciate. Because expected U.S. inflation falls as a result of the announcement, there will be an expected depreciation of the foreign currency and the
expected return on foreign deposits will fall. The $R^F$ curve thus shifts in to the left and the equilibrium exchange rate rises.

9. The franc will appreciate. The announcement of tariffs will raise the expected future exchange rate for the franc and so increase the expected appreciation of the franc. Taking France as the foreign country, this means that $R^F$ shifts out to the right, and the dollar exchange rate falls, so the franc appreciates.

11. The dollar will appreciate. The increase in U.S. productivity raises the expected future exchange rate and results in an expected depreciation of the franc, thus lowering the expected return on foreign deposits. The resulting leftward shift of the $R^F$ schedule leads to a rise in the equilibrium exchange rate.

15. Because it is harder to get French goods, people will buy more foreign goods and the French exchange rate in the future will fall. As a result the expected return on franc assets will fall at each exchange rate, $R^F$ will shift in and the value of the franc will fall (value of the dollar will rise).

Other questions:

1. a. This is explained by the tax advantage of municipal bonds. Because municipal bonds are income tax exempt, the expected return on municipal bonds is higher than the treasuries. Refer to pp 134 – 135 and Figure 3 of chapter 5 of the textbook for detailed analysis.
   b. The default risk on municipal bonds increases with its term to maturity. As the term to maturity becomes longer, municipal bonds become less desirable relative to treasuries. In other words, the default risk associated with longer term works against the tax advantage of municipal bonds. Hence the difference (municipal bond yield - treasury yield) becomes smaller in absolute value, while still remaining negative.

2. a. Apply the expectation hypothesis of term structure i.e., the long-term interest rates are averages of short terms. Then the yields on bonds of different maturities are

<table>
<thead>
<tr>
<th>Maturity</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- yr</td>
<td>5%</td>
</tr>
<tr>
<td>2- yr</td>
<td>$(5+6)/2 = 5.5%$</td>
</tr>
<tr>
<td>3- yr</td>
<td>$(5+6+7)/3 = 6%$</td>
</tr>
<tr>
<td>4-yr</td>
<td>$(5+6+7+6)/4 = 6%$</td>
</tr>
<tr>
<td>5-yr</td>
<td>$(5+6+7+6+6)/5 = 6%$</td>
</tr>
</tbody>
</table>

b. After adding corresponding liquidity premiums, the yields will be as follows:

<table>
<thead>
<tr>
<th>Maturity</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- yr</td>
<td>$5 + 0 = 5%$</td>
</tr>
<tr>
<td>2- yr</td>
<td>$5.5 + 0.25 = 5.75 %$</td>
</tr>
<tr>
<td>3- yr</td>
<td>$6 + 0.5 = 6.5 %$</td>
</tr>
<tr>
<td>4-yr</td>
<td>$6 + 0.75 = 6.75 %$</td>
</tr>
<tr>
<td>5-yr</td>
<td>$6 + 1 = 7 %$</td>
</tr>
</tbody>
</table>