1 Homework #3 Answer Key

Chapter 9 Questions

1. The money markets can be characterized as having securities that trade in one year or less, are of large denomination, and are very liquid.

5. Following the Great Depression, regulators were primarily concerned with stopping banks from failing. By removing interest-rate competition, bank risk was substantially reduced. The problem with these regulations was that when market interest rates rose above the established interest-rate ceiling, investors withdrew their funds from banks.

8. Merrill Lynch initially felt that it could better service its regular customers by making it easier to buy and sell securities from an account held at the brokerage house. The brokerage could offer a market interest rate on these funds by investing them in the money markets.

14. Large businesses with very good credit standings sell commercial paper to raise short-term funds. The most common use of these funds is to extend short-term loans to customers for the purchase of the firm’s products.

Chapter 12 Questions

8. Most mortgage loans are sold to government agencies. These agencies establish criteria for which loans they will accept. If the loans do not meet these criteria, the initiating bank cannot sell them.

14. A mortgage-backed security is one which has a pool of mortgages pledged as collateral.

15. The payments on a pool of mortgages are sent by the borrowers to a trustee, who then passes the payments through to holders of securities that are backed by the pass-through.

Chapter 7 Question

1. Because of traditional American hostility to a central bank and centralized authority, the system of 12 regional banks was set up to diffuse power along regional lines.

Chapter 8 Questions

3. The T-accounts are:

<table>
<thead>
<tr>
<th></th>
<th>Banking Sector</th>
<th>Federal Reserve System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>Liabilities</td>
<td></td>
</tr>
<tr>
<td>Reserves</td>
<td>+$1 million</td>
<td>Securities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+$1 million</td>
</tr>
</tbody>
</table>

4. The T-accounts are

<table>
<thead>
<tr>
<th></th>
<th>Banking Sector</th>
<th>Federal Reserve System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>Liabilities</td>
<td></td>
</tr>
<tr>
<td>Reserves</td>
<td>-$500,000</td>
<td>Discount Loans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-$500,000</td>
</tr>
</tbody>
</table>

8. Since the reserve requirement is 8.0%, the potential money multiplier is 1/.08, or 12.5. The sale of T-bills will act to decrease the money supply. The contraction will be on the order of $100,000,000×12.5=$1,250,000,000. However, if there are excess reserves in the system, it may not be this high.
Answers to remaining questions

1. Since the Fed’s assets have increased by roughly 250%, this means the monetary base has increased by the same amount. This could signal a huge increase in the money supply and possible inflation.

2. Given the quadratic utility function we have: \( U'(w) = k - w; U''(w) = -1 \). Since absolute risk aversion is given by:

\[
\text{ARA} = -\frac{U''(w)}{U'(w)} = \frac{1}{k - w}
\]

So ARA is increasing in \( w \) ⟹ Rich agents are more risk averse than poor agents. The figure below plots ARA for this utility function:

3. Certainty equivalence is the amount of wealth (or consumption, i.e. whatever is the argument in the utility function) that equates the certain utility of that amount to the expected utility of a gamble.

4. Certainty equivalent level of wealth is defined to be:

\[
E[U(w)] = U(w_{ce})
\]

or, using the functional form for utility

\[
E[-e^{-2w}] = -e^{-2w_{ce}} \quad \text{or}
\]

\[
E[e^{-2w}] = e^{-2w_{ce}}
\]

Let \( z = e^{-2w} \), then \( \ln z = -2w \). This implies \( \ln z \) is distributed normally with \( E(\ln z) = -4, Var(\ln z) = 4 \). Then, using the relationship that \( E(z) = e^{\mu + \frac{1}{2}\sigma^2} \) this implies the certainty equivalence is defined by

\[
E[e^{-2w}] = e^{-4 + \frac{1}{2}4} = e^{-2} = e^{-2w_{ce}}
\]

So \( w_{ce} = 1 \). Note that, due to risk aversion, \( 1 = w_{ce} < E(w) = 2 \). The figure below illustrates the answer:
5. See below

(a) Insurance profits are \( \pi = (1 - p) h + p (h - y) = 0 \) which implies \( h = py \).

(b) Using the result from (a), \( W_1 = W_0 - py, W_2 = W_0 - py - x + y \). Then \( \Delta W_1 = -p \Delta y \) while \( \Delta W_2 = (1 - p) \Delta y \). So

\[
\frac{\Delta W_2}{\Delta W_1} = \frac{-1 - p}{p}
\]

(c) \( E[U(W)] = pU(W_2) + (1 - p) U(W_1) \). Along an indifference curve: \( \Delta E[U(W)] = 0 = pU'(W_2) \Delta W_2 + (1 - p) U'(W_1) \Delta W_1 \). This implies

\[
\frac{\Delta W_2}{\Delta W_1} = \frac{-1 - p}{p} \frac{U'(W_1)}{U'(W_2)}
\]

(d) The optimum requires that the slope of the fair odds line (budget line) equals the slope of the indifference curve. But this implies that \( U'(W_1) = U'(W_2) \) which requires \( W_1 = W_2 \). Given the definition of these terms, this implies \( y = x \).