Problem Set #4

1. The Open Market Committee of the Federal Reserve decides to expand the money supply by buying $1000 worth of government securities from you. They pay you by means of a check. You deposit this check into your account at Grove Bank. Assume that the required reserve ratio is 10%. The balance sheets before this open market operation are as follows:

\[
\begin{array}{c|c||c|c}
\text{Fed. Reserve} & \text{Liabilities} & \text{Grove Bank} & \text{Liabilities} \\
| Assets & \text{Commercial Bank} & \text{Assets} & \text{Liabilities} \\
| Gov Securities & Reserves & \text{Reserves} & \text{Demand Deposits} \\
| $150,000 & $150,000 & $500 & $5,000 \\
\end{array}
\]

a) Write the new balance sheets for the Federal Reserve and Grove Bank immediately after you have deposited your check but before Grove Bank has made any more loans.
b) How much is Grove Bank required to hold as reserves, given its new level of deposits?
c) How much are the excess reserves?

Grove Bank will loan out this excess reserve since the bank receives no interest on these funds. Suppose they loan it out, and the funds eventually get deposited in Motley Bank. The following are balance sheets for Motley Bank and for the commercial banking system as a whole.

\[
\begin{array}{c|c||c|c}
\text{Motley Bank} & \text{All Commercial Banks} \\
| Assets & Liabilities & Assets & Liabilities \\
| Reserve(R) & Demand Deposit (DD) & R & DD \\
| $1000 & $150,000 & $150,000 & $1,500,000 \\
| Loans(L) & $9000 & $10,000 & L \\
| $9000 & $10,000 & $1,350,000 & \\
\end{array}
\]

d) Write the new balance sheet for Motley immediately after the claim of Motley on Grove Bank is settled at the Fed (through a transfer between their reserve deposits at the Fed).
e) What are the excess reserves of Motley Bank now?

These procedures demonstrate how the banking system affects the money supply.
f) Once all banks become fully loaned up, how much will money supply increase?
g) Write the new balance sheet for the commercial banking system as a whole.
h) How is the ultimate impact of the initial excess reserve related to the required reserve ratio?

2. The economy of Narnia contains 2,000 $1 bills.

a) If people hold all money as currency, what is the quantity of money?
b) If people hold all money as demand deposits and banks maintain 100% reserves, what is the quantity of money?
c) If people hold equal amounts of currency and demand deposits and banks maintain 100% reserves, what is the quantity of money?
d) If people hold all money as demand deposits and banks maintain a reserve ratio of 10%, what is the quantity of money?
e) If people hold equal amounts of currency and demand deposits and banks maintain a reserve ratio of 10%, what is the quantity of money?

3. What would be the effect on the money supply of each of the following?
   a. Declining public confidence in the banks
   b. A desire on the part of banks to increase their levels of excess reserves
   c. A desire on the part of people to keep more cash in their mattresses
   d. Monopolizing of the banking system into a single super bank
   e. Increased use of credit cards

4. In 1999, there was a broad concern about the Y2K computer problem. Banks and the Fed predicted that many people would want to hold additional cash in case there were financial problems on January 1, 2000. Use the money multiplier analysis to predicted what would happen to deposits and the money supply if people increased their holding of cash and the Fed kept the dollar amount of total reserves fixed. What would be the consequences for interest rates?

Now suppose instead of keeping reserves fixed, the Fed attempted to keep the federal funds rate constant. What would be the consequences for the money supply of the increased demand for cash?

5. Consider the following four government transactions. In each case, think about what is happening with fiscal policy (G,T) and monetary policy (MS).
   i) The federal government (Treasury) borrows $1 billion from the Fed by issuing debt (Treasury bills), and uses the proceeds to provide subsidized meals for public school children.
   ii) The government (Treasury) borrows $1 billion from the public in exchange for $1 billion in Treasury bills, and uses the proceeds to fix the potholes in Los Angeles streets.
   iii) The government collects $1 billion in taxes and uses the proceeds to finance research in cold fusion technology.
   iv) The Fed buys $1 billion worth of old worn out blue jeans from the public.

   a) For each of the transactions described above, indicate the effects, if any, on the money supply. Assume that banks stay fully loaned up, that the required reserve ratio is 10%, and that the public does not change the currency it holds when deposits change. Be sure to trace these changes all the way through the banking system.
   b) Compare and contrast the effects of these policies on the economy. In which case will GDP expand by the most? Explain.

6. Using Aggregate Demand and Aggregate Supply curves, show how each of the following affect the Short Run level of GDP and the Price Level?
   a. The Federal Reserve lowers the discount rate.
   b. The wheat crop in the Western U.S. is wiped out by a destructive hail storm.
   c. The government reduces the minimum wage.
   d. Households start to save a larger proportion of their disposable income.

7. Suppose that a law required the Fed to do everything possible to keep the inflation rate equal to zero. Using AS and AD curves, illustrate and explain how the Fed would deal with a) a negative money demand shock (i.e., the introduction of ATM machines caused a drop in the
demand for money), b) a negative spending shock (i.e., firms become pessimistic about the future and decrease their investment plans), and c) a negative aggregate supply shock (i.e., OPEC raises oil prices). What would the costs and benefits of such a law be?

Due Thursday 3 April