

The Monetary System and the Fed's Policy Rule

ECON 3133

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Problems

1. Suppose that the required reserve ratio is 0.08 for deposits, the excess reserves-to-deposit ratio is 0.04, and the currency-to-deposit ratio is 0.30.
 - a. If the monetary base is \$40 billion, what is the level of the money supply?
 - b. By how much does the money supply change if the Fed increases the required reserve ratio to 0.16? Assume that monetary base is unchanged at \$40 billion.
 - c. By how much does the money supply change if the Fed buys \$1 billion of government bonds in the open market? (keep the required reserve ratio at 0.08)

2. Consider the following cash management problem. A college student earns \$400 a month which she uses to meet personal expenses. All expenses are paid for in cash. She maintains a savings account at a local bank which pays 1 percent per month in interest. At the beginning of each month she deposits her \$400 paycheck in her savings account and makes periodic cash withdrawals throughout the month. Cash withdrawals are made through an automatic teller at a service charge of 25 cents each.
 - a. Calculate the student's average currency holdings and the number of withdrawals made each month.
 - b. Suppose it's observed that the student always withdraws \$40. There are several possible explanations. Perhaps she doesn't wish to risk losing larger amounts of cash. Protection against such loss is one of the benefits of a savings account. In addition, she may wish to avoid the temptation of spending more money than she can really afford. Call this the piggy bank value of savings accounts. What must the value of such benefits be, expressed as a rate of return, in order for her withdrawal of \$40 to be optimal?

3. Explain the effect that a lowering of the discount rate has on the money supply. In particular, consider the effect of such a change on the borrowed reserves, nonborrowed reserves, and total reserves. If total reserves change, what can the Fed do to offset that change?

4. The velocity of money V is defined by the expression: $V = P \times Y / M$. One way the Fed can set the money supply is described as follows. First, it assumes that the velocity of money remains roughly constant from year to year. Next, the Fed forecasts this year's inflation rate. Finally, the Fed chooses its target rate for real output growth. This results in a target growth rate for the money stock.
 - a. Suppose that inflation for the current year is forecasted to be 5 percent and that the Fed's target output growth rate is 2 percent. By how much should it increase the money stock?
 - b. Suppose now that money demand is given by the expression

$$M/P = (k \times Y - h \times R).$$

Derive an expression for the velocity of money V . On what does V depend?

- c. What economic events could change V ? Consider both the cases where $h > 0$ and $h = 0$.