14.02: Spring 98
Problem Set 3

1. Stocks vs. Flows. Please classify the following as a stock or a flow:
a. GDP
b. your credit card debt of $200
c. your financial investment of $300 in Apple stock
d. the $100/week you earn as a Research Assistant
e. the interest of 5%/year you earn on your savings account

2. Money Demand I. What has been the effect of the increased use of credit cards on money demand? How about the effect of the introduction of ATM's? Explain.

3. Money Demand II. Suppose that a person with yearly income of $30,000 has the following demand-for-money function:

$$M^d = \$Y(.6 - i)$$

a. What is the person's demand for money when the interest rate is 5%? 10%?
b. What is the person's demand for money when her yearly income is $50,000 and the interest rate is 5%? 10%?

4. Velocity. Using the information from Problem 3, assume that the demand for money is equal to the supply of money.
a. Find an expression for velocity at any given interest rate.
b. How does an increase in the interest rate affect velocity?
c. In the early 1990s, velocity was nearly double what it was in the early 1960s. Yet, the interest rate was almost the same in both periods. Please offer an explanation.

5. Equilibrium. Suppose that the money supply is $500 billion, nominal income is $5,000 billion and the demand for money is given by:

$$M^d = \$Y(.2 - i)$$

a. Determine the equilibrium interest rate. At that interest rate, what is the current price of a bond promising to pay $110 in one year?

b. Determine the impact on the interest rate if nominal income increases to $6,500 billion.
c. At the original level of nominal income, suppose that the central bank decided to set the interest rate at exactly 5%. What is the supply of money required in equilibrium?
d. Describe the central bank operations necessary to achieve the result in part (c). What is the current price of a bond promising to pay $110 in one year?

6. The Bond Market. Using the original information from problem (5) answer the following:
a. Determine the equilibrium interest rate in the bond market.
b. If nominal wealth in the economy is $3,000 billion, what is the demand for bonds?

7. The Money Multiplier. Suppose that the public holds no currency, the ratio of reserves to deposits is 0.2, and that the monetary base is $100 billion. What is the value of the money supply?