

1. Suppose that a person's yearly income is \$60,000. Also, suppose that this person's money demand function is given by:

$$M^d = \$Y(0.35 - i)$$

- a. What is this person's demand for money when the interest rate is 5%; 10%?
- b. Explain how the interest rate affects money demand.
- c. Suppose that the interest rate is 10%. In percentage terms, what happens to this person's demand for money if the yearly income is reduced by 50%?
- d. Suppose that the interest rate is 5%. In percentage terms, what happens to this person's demand for money if the yearly income is reduced by 50%?
- e. Summarise the effect of income on money demand. In percentage terms, how does this effect depend on the interest rate?

2. Consider a bond that promises to pay \$100 in one year.

- a. What is the interest rate on the bond if its price today is \$75; \$85; \$95?
- b. What is the relation between the price of the bond and the interest rate?
- c. If the interest rate is 8%, what is the bond's price today?

3. Suppose that money demand is given by:

$$M^d = \$Y(0.25 - i)$$

where: Y is \$100. Also, suppose that the supply of money is \$20.

- a. What is the equilibrium interest rate?
- b. If the central bank wants to increase the equilibrium interest rate i by 10 percentage points from its value in part (a), at what level should it set the supply of money?

4. Suppose that a person's wealth is \$50,000 and that their yearly income is \$60,000. Also, suppose that their money demand function is given by:

$$M^d = \$Y(0.35 - i)$$

- a. Derive the demand for bonds. Suppose the interest rate increases by 10 percentage points. What is the effect on their demand for bonds?
- b. What are the effects of an increase in wealth on their demand for money and bonds? Explain in words.
- c. What are the effects of an increase in income on their demand for money and bonds? Explain in words.
- d. Consider the statement 'When people earn more money, they obviously will hold more bonds.' What is wrong with this statement?

5. Suppose that before ATMs and credit cards, this person goes to the bank once at the beginning of each four days and withdraws from their savings account all the money they need for four days. Assume that they need: 4 per day.

- a. How much does this person withdraw each time they go to the bank? Compute this person's money holdings for days 1 to 4 (in the morning, before they need any of the money withdrawn).
- b. What is the amount of money this person holds, on average?
- c. Suppose now that this person withdraws money once every two days with the advent of ATMs.
- d. Recompute your answer to part (a).
- e. Recompute your answer to part (b).

Finally, with the advent of credit cards, this person pays for all her purchases using her card. They withdraw no money until the fourth day when they withdraw the

whole amount necessary to pay for the credit card purchases over the previous four days.

- f. Recompute your answer to part (a).
 - g. Recompute your answer to part (b).
 - h. Based on your previous answers, what do you think has been the effect of ATMs and credit cards on money demand?
6. *Assume the following:*
- i. *The public holds no currency.*
 - ii. *The ratio of reserves to deposits is 0.1.*
 - iii. *The demand for money is given by:*
- $$M^d = \$Y(0.8 - 4i)$$
- Initially, the monetary base is: 100 billion, and nominal income is \$5 trillion.*
- a. What is the demand for central bank money?
 - b. Find the equilibrium interest rate by setting the demand for central bank money equal to the supply of central bank money.
 - c. What is the overall supply of money? Is it equal to the overall demand for money at the interest rate you found in part (b)?
 - d. What is the effect on the interest rate if central bank money is increased to \$300 billion?
 - e. If the overall money supply increases to \$3,000 billion, what will be the effect on i ? (Hint: Use what you discovered in part (c).)

7. *Suppose that money demand is given by:*

$$M^d = \$Y(0.25 - i),$$

where \$Y is \$100.

- f. If the central bank sets an interest rate target of 5%, what is the money supply the central bank must create?
 - a. If the central bank wants to increase i from 5 to 10%, what is the new level of the money supply the central bank must set?
 - b. What is the effect on the central bank's balance sheet of the increase in the interest rate from 5 to 10%?
8. *Suppose that money demand is given by:*

$$M^d = \$Y(0.25 - i)$$

as long as interest rates are positive. The questions below then refer to situations where the interest rate is zero.

- a. What is the demand for money when interest rates are zero and $\$Y = 80$?
- b. If $\$Y = 80$, what is the smallest value of the money supply at which the interest rate is zero?
- c. Once the interest rate is zero, can the central bank continue to increase the money supply?

ADDITIONAL QUESTIONS:

1. *Label each of the following statements true, false or uncertain. Explain briefly:*
 - a. Income and financial wealth are both examples of stock variables.
 - b. The term investment, as used by economists, refers to the purchase of bonds and shares of stock.
 - c. The demand for money does not depend on the interest rate because only bonds earn interest.
 - d. A large proportion of US currency appears to be held outside the United States.

- e. The central bank can increase the money supply by selling bonds in the market for bonds.
- f. The central bank can determine the money supply, but it cannot change interest rates.
- g. Bond prices and interest rates always move in opposite
- h. directions.
- i. An increase in income (GDP) will always be accompanied by an increase in interest rates when the money supply is not increased.