CHAPTER 2
Money and Its Role in the Economy

Learning Objectives

- What the functions of money are
- How the Fed defines the monetary aggregates M1 and M2 and the credit aggregate domestic nonfinancial debt (DNFD)
- The evolution of the payments system
- How the demand and supply of money influence the interest rate
- How, in general, changes in money and credit influence the level of economic activity

Chapter Outline/Lecture Notes

I. Defining money

A. **Money** is anything that functions as a medium of exchange, a unit of account, and a store of value.

B. Money is unique among financial assets because it is acceptable as a **means of payment (medium of exchange)**. A **unit of account** is a standardized accounting unit such as the dollar that provides a consist measure of value. A **store of value** retains its value over time.

C. Money eliminates the need of a **double coincidence of wants** in a **barter economy**.

D Money will spontaneously develop in an exchange economy because it reduces the transactions costs of making exchanges.

II. The monetary aggregates and Domestic Nonfinancial Debt (DNFD)

A. The Fed monitors, collects, and publishes information on two different **monetary aggregates,** M1 and M2. One of the reasons the Fed does so is because what functions as money has changed overtime.

B. **M1** (transactions money) includes currency in the hands of the public, **checkable deposits**, and Travelers checks. Checkable deposits include **demand deposits** and **Negotiable Order of Withdrawal (NOW) Accounts.**

C. **M2** includes everything in M1 plus other highly liquid assets (**near monies**) including small savings and time deposits (<$100,000), including **money market deposit accounts** plus individual money market mutual funds.

D. In addition to M1 and M2, the Fed keeps track of **domestic nonfinancial debt (DNFD)** which is a measure of outstanding loans and debts accumulated by domestic nonfinancial sectors including the U.S. government, state and local governments, private nonfinancial firms, and households in the present and past years. The debt of financial institutions that borrow for the purpose of relending is not included to prevent double counting.

IV. The economy and the aggregates

A. Sometimes a given aggregate has been more highly correlated with the level of economic activity than at other times.

B. In the early and mid-1980s, M1 was the primary measure of money that the Fed watched. M2 gained importance in the late 1980s because there was a more stable relationship between changes in M2 and economic activity than between M1 and economic activity. In the early 1990s, changes in DNFD were most highly correlated with changes in economic activity. If credit is increasing, economic activity is increasing and vice versa. However, correlation does not imply causation.

C. In the mid 2000s, the Fed has looked to other indicators to aid in the execution of policy and used the monetary aggregates and DNFD as informational variables only.

V. The evolution of the payments system

A. The **payments mechanism** is the means by which transactions are completed.

B. Because of technological innovations, a larger percent of payments are made using an **electronic funds transfer system** which is the transfer of funds to third parties in response to electronic instruction rather than instructions written on a paper check.

C. Such innovations include **debit cards**, **stored-value cards**, **smart cards**, **point-of-sale terminals**, and **ATMs**.

VI. The demand for money

A. The **interest rate** is the cost to borrowers of obtaining money and the return (or yield) on money to lenders.

B. The **quantity demanded of money** is the specific amount of money that spending units will wish to hold at a specific interest rate (price). Ceteris paribus, there is an inverse relationship between the interest rate and the quantity demanded of money.

C. The **demand for money** is the entire set of interest rate-quantity demanded combinations as represented by a downward-sloping demand curve for money. The demand for money is directly related to income.

D. A change in the demand for money is represented by a shift of the demand curve while a change in the quantity demanded of money is represented by a movement along a demand curve due to a change in the interest rate.

VII. The supply of money

A. The **supply of money** is the stock of money which includes currency in the hands of the public plus checkable deposits issued by depository institutions. **Depository institutions** hold **reserves** equal to a certain fraction of checkable deposits. The reserve assets may be held as either vault case or deposits accounts with the Fed.

B. The Fed sets the **required reserve ratio** which is the percentage of deposit liabilities that depository institutions must hold as reserve assets. The Fed also influences the amount of cash assets outstanding and hence the amount available for reserves. Because of these two factors, the Fed has substantial influence over the supply of money.

C. The **quantity supplied of money** is the specific amount of money that will be supplied at a specific interest rate. The **supply of money** is the entire set of interest rate-quantity supplied combinations. The supply of money is a vertical line.

D. A change in the supply of money is represented by a shift of the supply curve while a change in the quantity supplied of money is represented by a movement along a supply curve due to a change in the interest rate.

VIII. Money and interest rates

A. The interest rate is determined by the supply and demand for money. The market gravitates to the interest rate where the quantity demanded is equal to the quantity supplied.

B. If demand increases, the interest rate rises and vice versa.

C. If supply increases, the interest rate falls and vice versa.

Answers to Review Questions

1. Discuss or define briefly the following terms and concepts: means of payment, store of value, unit of account, barter, monetary aggregates, liquidity, domestic nonfinancial debt, electronic funds transfer system, and risk.

Means of payment: Something that is generally accepted and used to make payments.

Store of value: Something that retains its value over time.

Unit of account: A standardized accounting unit, such as the dollar, which is the standard measure of value.

Barter: Trading goods for goods in an exchange economy.

Monetary Aggregates: The measures of money, including MI, M2, M3, and L, which the Fed keeps track of and monitors.

Liquidity: The ease with which a non-monetary asset can be converted to money without loss of value.

Domestic Nonfinancial Debt: Total credit market debt owed by the nonfinancial sector and accumulated in the past and present years; includes the debt owed by the household, nonfinancial business, government, and rest of the world (foreign) sectors.

EFTS (Electronic Funds Transfer System): The transfer of funds to third parties in response to electronic instructions rather than instructions written on paper checks.

Risk: The possibility of financial assets losing value.

2. What are the functions of money? Which function do you think is most important?

The functions of money are to serve as a means of payment (medium of exchange), a unit of account, and a store of value.

The most important function of money is to serve as a means of payment (medium of exchange). Thus, it is critical that money is generally accepted to make payments. Without a generally accepted means of payment, exchange is very costly. For an exchange to take place,

there would have to be a double coincidence of wants where the person you wished to buy from wanted what you were offering in exchange.

3. Suppose we define *money* as that which serves as a store of value. Explain why this is a poor definition.

Defining money as something that serves as a store of value is a poor or incomplete definition of money. Many items such as diamonds, gold, bank accounts, or houses can store value, but are not generally accepted as means of payment. For example, you cannot buy a hamburger with a rare oil painting even though it may be an excellent store of value.

4. How does the Fed calculate M1, M2, and DNFD? Are these aggregates all money? Why or why not? Which contains the most liquid assets? Which is smallest? Which is largest?

To calculate M1, M2, and DNFD, we merely add up the items included in the aggregate as follows:
M1 = currency in the hands of the public + demand deposits at commercial banks + other checkable deposits + travelers' checks

M2 = M1 + small savings and time deposits (less than $100,000), including money market deposit accounts + individual money market mutual funds

DNFD = credit market debt of the U.S. Government and state and local governments + corporate bonds + mortgages + consumer credit (including bank loans) + other bank loans + commercial paper + other debt instruments

All of these aggregates except DNFD are a measure of money. M1 is the narrowest measure of money and the smallest aggregate. M1 is generally used for transactions and contains the most liquid assets—assets that are money per se. M2 is a broader measure of money that includes M1 and other near money assets. For example, M2 contains everything in M1 plus some other highly liquid near monies. DNFD is the largest aggregate but many of the items in DNFD are not money or near monies. DNFD is the broadest measure of nonfinancial credit in the domestic economy.

5. Why is the debt of financial institutions excluded from DNFD?

Financial institutions borrow funds from net lenders for the purpose of relending the funds to net borrowers. The reason why DNFD excludes the debt of financial institutions is that including such debt would be double counting. For example, suppose Bank X borrows surplus funds from small passbook savers and relends them to Jack to buy his first home. If the debt of the financial institution is counted, both the mortgage debt of Jack and the debt of Bank X to the passbook saver would be included in the aggregate.

6. What is the payments mechanism? What changes are occurring in this mechanism? Why are they occurring? How do smart cards differ from stored value cards?

The "payments mechanism" is the means by which transactions are consummated: that is, how money is transferred in an exchange. With technological advances, the means by which payments are made is dramatically changing. More and more payments are now being made electronically rather than with cash or instructions written on a paper check. For example, the use of debit cards, smart cards, stored-value cards, point-of-sale terminals, and other electronic transfers are all ways to make payments electronically. These changes are occurring because

technological advances have made it cheaper to make payments electronically rather than using cash or checks.
Stored-value cards are plastic cards that have a certain amount of funds embedded on a magnetic strip. Smart cards are much more sophisticated in that they have a microprocessor chip embedded in them that stores information and usually includes a digital signature. Like stored-value cards, they are used to make payments.

7. Zoto is a remote island that has experienced rapid economic development. In contrast, Zaha is an island where growth has been sluggish and the level of economic activity remains low. How could the existence of money have affected these two outcomes?

Since money facilitates economic development, one would suspect that Zoto has sophisticated and advanced "money," while Zaha relies mainly on barter. The existence of money could explain the differing growth rates.

8. Your friend took a class in money and banking two years ago and recalls that currency in the hands of the public is in M1. Explain to your friend why currency in the hands of the public is also included in M2.

M2 includes everything in M1 plus other less liquid, near money assets. Since currency in the hands of the public is in M1, it is therefore in M2 also.

9. Briefly define the interest rate, reserves, and the required reserve ratio.

Interest Rate: The cost to borrowers of obtaining money and the return (or yield) of money to lenders.

Reserves: Assets that are held by depository institutions as either vault cash or reserve deposit accounts with the Fed.

Required Reserve Ratio: Depository institutions must have reserve assets equal to a certain percentage of deposit liabilities; the required reserve ratio is that percentage.

10. Discuss the similarities between how the price of compact discs is determined in the compact disc market and how the interest rate is determined in the market for money.

The price of compact discs is determined by the demand and supply of compact discs in the market for compact discs. The interest rate (the price of borrowing or lending money) is determined by the supply and demand for money in the market for money. In both cases, the price is determined by the factors affecting the supply and demand of each item.

11. What is the difference between the demand for money and the quantity demanded of money?

The demand for money is amount of money that will be demanded at various interest rates. In other words, it is the entire set of interest rate-quantity demanded combinations as represented by a downward-sloping demand curve.

The quantity demanded of money is the amount that will be demanded by spending units at a specific interest rate. When the interest rate changes, the quantity demanded of money changes. The interest rate and the quantity demanded are inversely related, ceteris paribus.

12. What is the opportunity cost of holding money?

The opportunity cost of holding money is the value of the next best alternative to holding money. This is the interest that could be earned by holding non-monetary assets.

13. Chris and Harold Yoshida are a young couple with a growing income. What will happen to their demand for money over time?

Since income is directly (positively) related to the demand for money, as the Yoshida's income grows over time, their demand for money will also grow.

14. In what form can a depository institution hold reserves? Who determines the amount of funds available for reserves? How does the Fed influence the amount of reserves a depository institution must hold?

A depository institution can hold reserves as either vault cash or reserve deposit accounts with the Fed. The Fed determines the amount of cash assets outstanding and hence the amount available for reserves. The Fed influences the amount of reserves assets a depository institution must hold by setting the required reserve ratio.

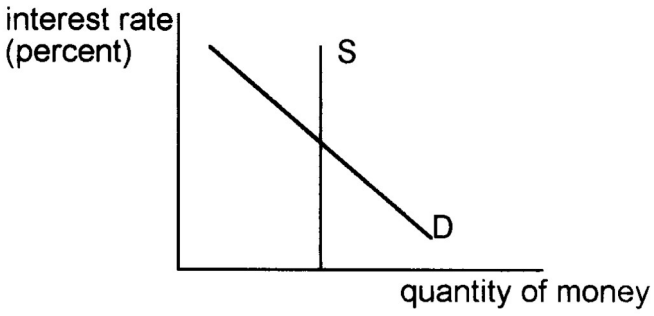
Answers to Analytical Questions

15. In which monetary aggregate(s) is each of the following assets included?

a. Small savings and time deposits ($100,000 or less)
b. Money market deposit accounts
c. Currency in the hands of the public
d. Checkable deposits
e. Individual money market mutual funds
f. Institutional money market mutual funds
g. Large time deposits
h. Travelers' checks

a. M2
b. M2
c. M1, M2,
d. M1, M2,
e. M2
f. Neither M1 or M2
g. Neither M1 or M2
h. M1, M2

16. Show on a graph how the interest rate and the quantity demanded of money are related. Do the same for the quantity supplied of money. When is the market in equilibrium?



The demand curve of the graph above shows that the interest rate and the quantity demanded of money are inversely related. The supply curve of the graph above also shows that any given supply of money—as determined by the Fed—is independent of the interest rate. The market is in equilibrium at the interest rate where the supply curve (S) and the demand curve (D) intersect. That is, at the interest rate where the quantity demanded of money is equal to the quantity supplied.

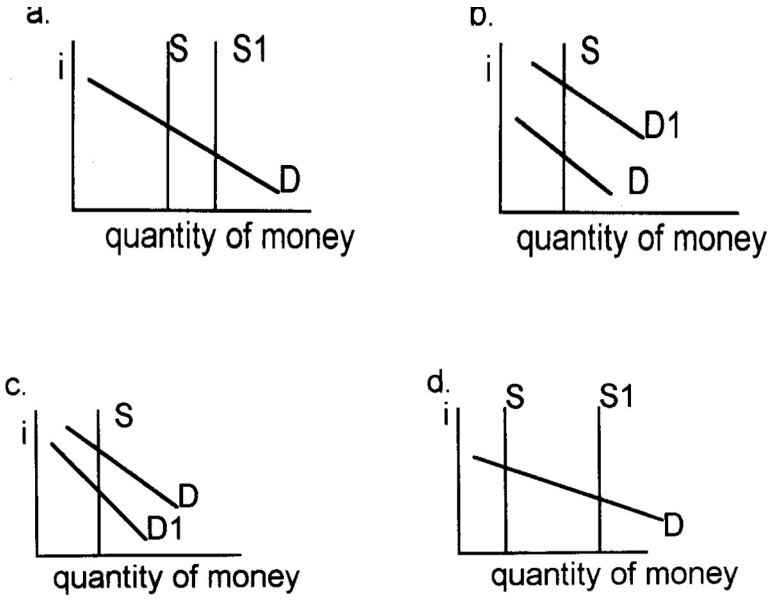
17. Assume the market for money is originally in equilibrium. Explain what happens to demand, supply, quantity demanded, and/or quantity supplied, ceteris paribus, given each of the following events:

a. The Fed lowers reserve requirements.
b. Households increase their spending plans.
c. Income falls due to a severe recession.
d. The Fed steps up its provision of reserves to depository institutions.

a. Demand for money stays the same; the supply of money increases (supply curve shifts rightward); quantity demanded increases due to the fall in interest rates; quantity supplied increases because of the rightward shift of the supply curve.
b. Demand for money increases (demand curve shifts rightward) causing the interest rate to rise; the supply of money stays the same; quantity demanded stays the same; quantity supplied stays the same.
c. Demand for money decreases (demand curve shifts leftward); the supply of money stays the same; quantity demanded and quantity supplied stay the same.
d. Demand for money stays the same; the supply of money increases due to the increased provision of reserves; quantity demanded and quantity supplied both increase.

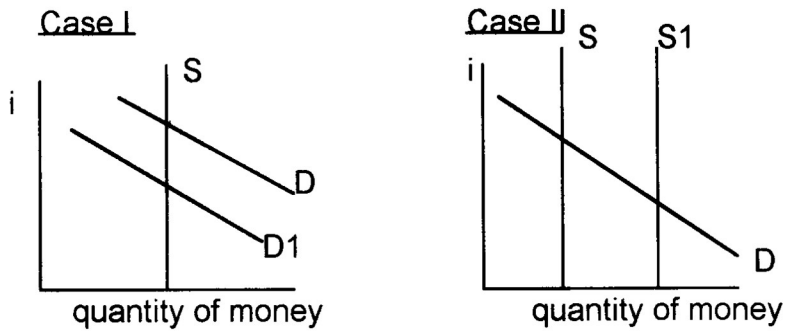
18. Graph each case presented in question 14.

Graph a illustrates question 14a, where the supply curve shifts from S to S1. Graph 14b illustrates question 14b, where the demand curve shifts from D to D1. Graph 14c illustrates question 14c, where the demand curve shifts from D to D1. Graph 14d illustrates question 14d, where the supply curve shifts from S to S1.

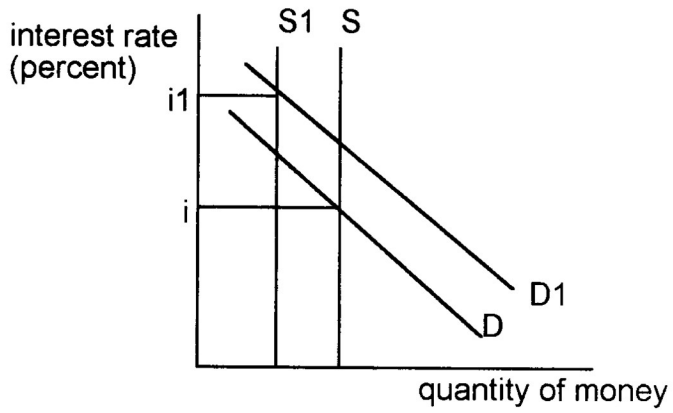


19. Ceteris paribus, what happens to the demand for money if incomes go down? Ceteris paribus, what happens to the supply of money if reserves go up? In each case, does the interest rate change? Graph each case.

If incomes go down, the demand for money decreases (Case 1) and interest rates fall. If reserves go up, the supply of money increases (Case 11) and the interest rate falls.



20. Use a graph to show what happens to the interest rate if the demand for money is increasing while the supply of money is decreasing.



The graph above shows what happens to the interest rate when the demand for money is increasing and the supply of money decreasing. Originally, the market is in equilibrium where the demand curve (D) and the supply curve (S) intersect at interest rate i. At equilibrium, the quantity supplied of money is equal to the quantity demanded. When the demand for money increases from D to D1, and the supply of money decreases from S to S1, the market will move to the intersection of the new demand and supply curve. The interest rate increases to i1.