Chapter in a Nutshell

Although we know from experience that, under certain circumstances, barter exchange works, the complications associated with the requirements of a double coincidence of wants make the exchange of one good for another inefficient in the modern world. Money was invented to facilitate exchange. Money serves three functions. It is a medium of exchange, a measure of value, and a store of value. What properties must money have? It must be durable, portable, divisible, homogeneous, and be relatively scarce. Gold has these characteristics and has long been used as money. Paper money — called fiat money — works as well, as long as it is universally accepted as the medium of exchange.

Let's look at our modern world of money. Money is described as a liquid asset because it exchanges easily for other assets. Our money supply is categorized according to its liquidity. M1 is the most liquid. It includes currency and demand deposits (our checking accounts) and traveler's checks. M2 is M1 money plus savings accounts, certificates of deposit, money market mutual funds, money market deposit accounts, repurchase agreements, and small-denomination time deposits. M3 is M2 money plus other less liquid forms of money such as large denomination time deposits and large overnight repurchase agreements.

The relationship between an economy's prices and its money supply is expressed in the quantity theory of money, which derives from the equation of exchange: \( MV = PQ \), where \( M \) is the money supply, \( V \) is the velocity of money, \( P \) is the price level, and \( Q \) the quantity of goods. The quantity theory of money restates the equation to read, assuming both \( V \) and \( Q \) are constant:

\[
P = \frac{MV}{Q}.
\]

We now see the direct relationship between money and prices (increase money, and the price level increases).

Economists hold different views concerning the velocity of money. Classical economists believe velocity is constant; monetarists believe it is not constant but stable and predictable; and Keynesians believe it is neither constant, stable, nor predictable. Economists' views on velocity affect their policy prescriptions. These show up in their theories of demand for money.

Classical economists believed that the demand for money is strictly a transactions demand, that is, a demand arising from the need to carry out transactions. They assume that since output is constant at full employment and velocity is constant, then the transactions demand for money depends on the price level. Monetarists accept the variability of velocity but believe that \( MV = PQ \) can still be a good tool for analysis because even though velocity is variable, it is predictable.

Keynesians believe that there are three motives for demanding (holding) money: the transactions motive, the precautionary motive, and the speculative motive. The speculative demand for money is inversely related to the interest rate. A fall in the interest rate increases the quantity demanded of money. Therefore, if the money supply increases, interest rates will fall and investment will increase, causing aggregate demand and real GDP to increase. To Keynesians, money matters. Classical economists and monetarists, on the other hand, believe that increases in the money supply only cause the price level to increase because the economy is continuously at full employment.
After you study this chapter, you should be able to:

- Explain why **money** has replaced **barter**.
- List the functions of money.
- Explain the **liquidity characteristics** of our money supply.
- Describe the **classical view of money demand** and the **quantity theory of money**.
- Explain **monetarism**.
- Contrast the **Keynesian** and the **monetarist** views of **money demand**.
- Account for the Keynesian belief that money matters.

**Concept Check** — See how you do on these multiple-choice questions.

1. A significant problem with **barter exchanges** in a modern economy is that
   a. only one party benefits from barter exchanges
   b. converted into money terms, barter prices typically are lower
   c. converted into money terms, barter prices typically are higher
   d. barter requires a double coincidence of wants, which is often difficult to achieve
   e. only agricultural goods can be exchanged by barter

   The more liquid an asset is, the easier it is to... .

2. **Liquidity** refers to
   a. money flows in the circular flow model
   b. flows of goods and services in the circular flow model
   c. the fact that gold is easy to melt and purify
   d. the fact that flows of debased coins drive out flows of good coins according to Gresham's law
   e. the degree to which an asset can be easily exchanged for money

   How did the classical economists view velocity compared to monetarists?

3. The main difference in viewpoints about **velocity** between the classical economists and monetarists is that classical economists believed that
   a. velocity was constant and monetarist believe that it is variable but predictable
   b. velocity was determined by the money supply and monetarists believe that velocity is determined by interest rates
   c. velocity was determined by the price level and monetarists believe that velocity determines the price level
   d. velocity is variable but predictable and monetarists believe that velocity is constant
   e. velocity increases as real GDP increases and monetarists believe that velocity is independent of GDP

   The quantity theory of money focuses on the amount of money in circulation.

4. The **quantity theory of money** states that
   a. the quantity of money in circulation depends on the velocity of money
   b. the price level is proportional to the quantity of money in circulation
   c. velocity and real GDP fluctuate significantly in the short run
   d. the quantity of money in circulation is proportional to the price level
   e. velocity is not constant, but it is highly predictable
Why do people demand money?

5. The **transactions demand for money**
   a. is the quantity of money demanded by households and businesses to transact their buying and selling of goods and services
   b. decreases as the interest rate increases
   c. increases as the interest rate increases
   d. is the only determinant of the demand for money, according to Keynesians
   e. is money held as insurance against unexpected needs

**Am I on the Right Track?**

Your answers to the questions above should be d, e, a, b, and a. You can divide your study of this chapter into two parts. The first part focuses on the nature of money, its role in society, and the characteristics of the money supply. The material is largely descriptive. The second part of the chapter is more theoretical. Here, you need to learn the similarities and differences among the classical, monetarist, and Keynesian theories of money’s role in the economy. The differences among these monetary theories are the source of enormous controversy and debate among economists.

**Key Terms Quiz** — Match the terms on the left with the definitions in the column on the right.

1. barter
2. M2 money supply
3. money
4. fiat money
5. currency
6. equation of exchange
7. liquidity
8. the quantity theory of money
9. transactions demand for money
10. M1 money supply
11. money supply
12. velocity of money

   a. coins and paper money
   b. the supply of the most immediate form of money that includes currency, demand deposits, and traveler’s checks
   c. paper money that is not backed by or convertible into any good
   d. \( P = \frac{MV}{Q} \)— the equation specifying the direct relationship between the money supply and prices, assuming \( V \) and \( Q \) are constant
   e. the M1 money supply plus savings accounts, money market mutual fund accounts, money market deposit accounts, repurchase agreements, and small-denomination time deposits
   f. the exchange of one good for another, without the use of money
   g. typically, the M1 money supply — currency, demand deposits, and traveler’s checks used in transactions
   h. the quantity of money demanded by households and businesses to transact their buying and selling of goods and services
   i. any commonly accepted good that acts as a medium of exchange, a measure of value, and a store of value
   j. \( MV = PQ \)
   k. the degree to which an asset can easily be exchanged for money
   l. the average number of times per year each dollar is used to transact an exchange

**Graphing Tutorial**

Keynesians view the demand for money as comprised of three parts — the transactions motive (the source of demand for money according to the classical and monetarist views), the speculative motive, and the
precautionary motive. The speculative demand for money arises from the fact that people have a choice to hold their assets either as money, which earns little or no interest, or as other financial assets that do earn interest. How people choose to split their assets between money and interest-bearing assets depends on the interest rate. As the interest rate decreases, people choose to hold more money because the opportunity cost of holding money (what they give up in interest income from interest-bearing assets) has fallen. By holding a larger proportion of their assets in money, people are in a better position to take advantage of buying opportunities that might arise. That is to say, they put themselves in a better position to speculate by holding more cash. This logic allows us to graph the speculative demand for money as a downward-sloping function of the interest rate as shown below.

A decrease in the interest rate from \( i \) to \( i' \) causes the quantity demanded of money to increase from \( M \) to \( M' \). Now we are in a position to understand how money matters to a Keynesian. Suppose the money supply curve, shown as a vertical line labeled \( S \) in Panel A below, increases to \( S' \). The increase in the money supply causes a decrease in the interest rate that results in an increase in the quantity of investment in Panel B. This increase in investment will cause the aggregate demand curve to shift to the right, raising the equilibrium level of real GDP if the economy is operating below the full-employment level.
Graphing Pitfalls

As usual, labeling the axes incorrectly is a pitfall to avoid when graphing the speculative demand for money. The speculative demand for money is downward sloping — typical for a demand curve — and the quantity of money is measured on the horizontal axis — also typical — but the vertical axis doesn’t measure price. The interest rate is the price of holding money in this case. The interest rate is what a person gives up in order to hold money rather than an interest-bearing asset. So label the vertical axis with the interest rate.

![Graph of speculative demand for money](image)

The interest rate is the opportunity cost of holding money, so the vertical axis is labeled with the interest rate, not price as shown above.

**True-False Questions** — If a statement is false, explain why.

1. Barter only works effectively when there is a double coincidence of wants. (T/F)

2. Gold has properties that make it a good form of money. (T/F)

3. Paper money that is backed by gold is called fiat money. (T/F)

4. According to Keynesians, when the economy is in a recession, an increase in the money supply would decrease the interest rate and, consequently, increase the level of investment and real GDP. (T/F)

5. An asset is considered to be liquid if it can be exchanged easily for money. (T/F)

6. As one compares the various forms of money supply in order — from M1, to M2, to M3 — increasingly liquid assets are included. (T/F)
7. Time deposits, such as people’s savings accounts, are considered to be part of M1. (T/F)

8. The largest category of our M2 money supply is in the form of currency. (T/F)

9. The transactions demand for money refers to the amount of money necessary for people to transact the buying and selling of goods and services. (T/F)

10. If the velocity of money is equal to 1, then the transactions demand for money is equal to nominal GDP. (T/F)

11. The quantity of money demanded to satisfy people's speculative motive increases as the interest rate decreases. (T/F)

12. Assuming full employment and a constant velocity of money, an increase in the money supply will lead to a proportionate increase in the price level. (T/F)

13. Monetarists believe that the velocity of money is highly variable and impossible to predict. (T/F)

14. The three motives that Keynesians believe influence people's demand for money are transactions, precautionary, and speculative. (T/F)

15. Keynesians argue that money velocity is neither constant nor predictable, and is affected, in large measure, by changes in people's expectations of future prices. (T/F)

Multiple-Choice Questions

1. The most liquid form of money is
   a. M1
   b. M2
   c. M3
   d. gold
   e. barter

2. The creation of new financial innovations, such as NOW accounts and ATS accounts, has
   a. created distinct differentiations between M1 and M2 money
   b. created distinct differentiations between M2 and M3 money
   c. blurred the distinctions between M1 and M2 money
   d. blurred the distinctions between M2 and M3 money forms
   e. made credit cards, such as Visa and MasterCard, a new form of money
3. All of the following are included in the M3 money supply **except**
   a. currency
   b. corporate bonds
   c. savings accounts
   d. large-denomination time deposits
   e. large-denomination repurchase agreements

4. In order to serve as a medium of exchange, money must fulfill all of the following requirements **except**
   a. divisibility
   b. homogeneity
   c. scarcity
   d. attractability
   e. durability

5. According to Keynes, the demand for money
   a. is an increasing function of the interest rate, that is, as the interest rate rises, the demand for money rises
   b. depends on the supply of money, which is determined by the government
   c. is based solely on the amount of money needed to transact aggregate supply
   d. is based on people’s transactions, speculative, and precautionary motives for holding money
   e. exceeds the money supply when real GDP is greater than nominal GDP

6. All of the following statements about M1 are correct **except**
   a. M1, compared to M2 and M3, is the most readily available money form
   b. M1 includes checking accounts, which are generally more liquid than savings accounts
   c. M1 excludes currency, which is the least liquid form of money
   d. travelers’ checks are a form of M1 money
   e. the M1 money supply is less than the quantities that make up M2 and M3

7. The classical model of money demand holds that the demand for money is dependent on
   a. the money supply
   b. the interest rate
   c. nominal GDP and the velocity of money
   d. the precautionary and speculative motives for holding money
   e. changes in the velocity of money

8. According to the equation of exchange, \( MV = PQ \), a short-run increase in the money supply equal to 10 percent will cause the price level to increase by 10 percent if \( V \) is
   a. variable and \( Q \) is below full employment
   b. variable and \( Q \) is at full employment
   c. constant and \( Q \) is at full employment
   d. constant and \( Q \) is below full employment
   e. variable but predictable and \( Q \) is close to full employment
9. The main difference between the classical view of money's role in the economy and the monetarist view of money is that the classical school
   a. held that the economy was very competitive while monetarists saw the economy as dominated by monopoly power
   b. held that velocity was variable but predictable while monetarists argued that velocity was constant
   c. thought that the economy was always at full employment while the monetarists argued that persistent unemployment could arise
   d. saw money demand as solely a transactions demand while monetarists viewed money demand as stemming from precautionary and speculative motives
   e. held that the velocity was constant while monetarists argued that velocity could vary over time in ways that are predictable

10. The value of money diminishes as
    a. it becomes more divisible
    b. society abandons gold and silver for paper currency
    c. it becomes more plentiful relative to other goods
    d. an economy becomes more advanced
    e. credit cards come into widespread use

11. The equation of exchange, \( MV = PQ \), suggests that if we assume that velocity is constant and the economy is at full employment or moving toward it quickly, then in the short run
    a. an increase in the money supply will cause interest rates to fall and spending to increase
    b. an increase in government spending will increase real GDP
    c. an increase in taxes will cause real GDP to decrease
    d. an increase in the money supply will cause a proportionate increase in the price level
    e. monetary policy can influence the level of real GDP

12. According to the classical view of the quantity theory of money,
    a. an increase in the money supply causes real output to increase
    b. velocity is highly variable in the short run
    c. an increase in the money supply causes nominal GDP to fall
    d. an increase in the money supply causes the price level to increase proportionately
    e. the impact of an increase in the money supply is impossible to predict

13. If nominal GDP is $5 trillion, and the money supply is $500 billion, then, according to the equation of exchange, the velocity of money is
    a. 5
    b. 0.5
    c. 10
    d. 100
    e. 2.5

14. John demonstrates the speculative motive for holding money by
    a. holding money, waiting for stock prices to rise
    b. holding money, "for a rainy day"
    c. not spending money in May because he plans to get married and honeymoon in June
    d. borrowing money from the local bank to finance his college education
    e. buying a large quantity of lottery tickets because he speculates "today's the day"
15. John demonstrates the precautionary motive for holding money by
   a. holding money "for a rainy day"
   b. borrowing money from the local bank to finance his college education
   c. sleeping with his cash under the mattress
   d. not spending money in May because he plans to get married and honeymoon in June
   e. holding money, waiting for stock prices to rise

16. According to Keynesians, changes in the money supply can affect real GDP in the following way:
   a. a money supply increase when the economy is at full employment
   b. a money supply decrease when the price level increases
   c. a money supply increase when the economy is below full employment
   d. a money supply decrease shifts the investment curve to the left, which increases real GDP
   e. a money supply decrease creates an excess demand for holding money, which raises real GDP

17. The speculative demand for money curve is downward sloping because as the interest rate decreases,
   a. the opportunity cost of investing increases
   b. the opportunity cost of holding money decreases
   c. saving increases
   d. the opportunity cost of holding interest-paying assets decreases
   e. the opportunity cost of holding money increases

18. Barter exchange refers to
   a. exchange of one good for another
   b. the equilibrium price that arises after much bargaining and bartering occur in the market
   c. exchange of a good for a unit of currency other than gold
   d. exchange of a good for a unit of gold
   e. the sum of all values buyers and sellers place on the goods exchanged in an economy during a calendar year

19. Keynesians believe that money matters because an increase in the money supply causes the interest rate to
   ______________________ and the quantity of investment to ______________________ while monetarists believe that an increase in the money supply only causes the ______________________ to increase.
   a. increase; decrease; nominal GDP
   b. decrease; increase; real GDP
   c. decrease; increase; price level
   d. decrease; decrease; price level
   e. increase; increase; real GDP

20. According to classical economists, a 5 percent increase in the money supply coupled with a 5 percent increase in real GDP will create
   a. a 5 percent increase in the velocity of money
   b. a 5 percent increase in the price level
   c. no change in the price level
   d. a 25 percent increase in the price level
   e. a 10 percent increase in the velocity of money
The following questions relate to the historical, applied, and interdisciplinary perspectives in the text.

21. Gresham’s Law is the idea that if debased coins and pure coins circulate together, very quickly
   a. only the pure coins will circulate because no one will accept the debased coins
   b. both types of coins will circulate equally well
   c. only the debased coins will circulate because people will hoard the pure coins
   d. good money drives out bad
   e. a government can solve its budget problems by reducing the amount of gold or silver in its coins

22. The word dollar has its origins in all of the following names for currencies except
   a. thaler
   b. daalder
   c. tolar
   d. piastre
   e. Joachimsthaler

23. The introduction of money market mutual funds by investment houses, negotiable order of withdrawal
    accounts by savings and loan associations, and share-draft accounts by credit unions since the late 1970s
    has caused
   a. most traditional banks to go out of business
   b. a rapid increase in the M1 money supply
   c. a blurring of the distinction between M1 and M2
   d. a decrease in the M2 money supply
   e. greater regulation of all types of financial institutions

24. An unintended positive consequence of increased use of credit cards as a means of payment is that
   a. velocity will remain more constant
   b. the money supply can be reduced
   c. the transactions demand for money will fall dramatically
   d. street crime may decrease since people carry less cash
   e. interest rates will fall

25. The concept of the velocity of money can be illustrated by students selling used textbooks after the
    semester is over because
   a. the velocity of money is equal to one just as each student taking a course buys one textbook for the
      course
   b. textbooks are sold after the semester to new students who use them again, just as money is used over
      and over
   c. as textbook sales increase the velocity of the author’s money decreases
   d. as textbook sales increase the velocity of the author’s money increases
   e. the velocities of money and of textbooks are roughly the same, between 7 and 8

26. The table listing prices of various goods expressed in the number of beaver pelts is an example of
   a. a good being used as money
   b. fiat money
   c. barter
   d. liquidity
   e. near money

Fill in the Blanks

1. Barter requires a ________________________.
2. Money serves three functions. It is a __________________________, a _______________________, and
   a ______________________________.

3. Monetarists view the demand for money as a ______________________ demand while Keynesians think
   that the demand for money consists of the ______________________ demand in addition to the
   ______________________ motive and the ______________________ motive.

4. The equation of exchange is written as $MV = PQ$ where $M$ is __________________, $V$ is
   __________________, $P$ is __________________, and $Q$ is
   __________________.

Discussion Questions

1. Discuss the advantages of money over barter.

2. Does a $100 nominal GDP imply a $100 money supply? Explain.

3. What's the difference between the equation of exchange and the quantity theory of money?

4. Suppose the economy is at full employment and that consumers increase their saving, causing aggregate
   expenditure to decrease. Explain what happens to real GDP and the transactions demand for money.
5. Using graphs, show how a decrease in the money supply could eliminate an inflationary gap. Label and explain your graphs carefully.

Everyday Applications

Consider the implications of eliminating currency from our economic life. Many people have already adopted purchasing habits that allow them to function without using currency. How would this affect your daily life? What would be the advantages and drawbacks of a world without currency?

Economics Online

The history of money is a fascinating topic. You can easily review the history of money from ancient times to the present on the Web at a site maintained by Roy and Glyn Davies titled, A Comparative Chronology of Money from Ancient Times to the Present Day. The address is (http://www.ex.ac.uk/~RDavies/arian/amser/chrono.html).

Answers to Questions

Key Terms Quiz

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True-False Questions

1. True
2. True
3. False. Fiat money is not backed by gold or any other good.
4. True
5. True
6. False. Less liquid assets are included as we move from M1 through M2 and M3.
7. False. Time deposits are part of M2.
8. False. The largest category of the M2 money supply is savings accounts.
9. True
10. True
11. True
12. True
13. False. Monetarists believe that velocity is fairly constant and predictable.
14. True
15. True

Multiple-Choice Questions

1. a  6. c  11. d  16. c  21. c  26. a
2. c  7. c  12. d  17. b  22. d
3. b  8. c  13. c  18. a  23. c
5. d  10. c  15. a  20. c  25. b

Fill in the Blanks

1. double coincidence of wants
2. medium of exchange; measure of value; store of value
3. transactions; transactions; speculative; precautionary
4. the money supply; velocity; the price level; the quantity of goods produced

Discussion Questions

1. The problem with barter is that it requires a double coincidence of wants in order to accomplish an exchange. In an economy with many people trading a wide variety of goods, finding double coincidences of wants to accomplish all the desired exchanges would be enormously difficult. That is why money is introduced as a universally accepted good for use in exchanges. Money becomes, as Adam Smith put it, a kind of universal pledge. Less time and energy are required to make exchanges with money instead of barter.

2. A $100 nominal GDP would imply a $100 money supply only when velocity is equal to 1. Typically, velocity is greater than 1. If the velocity were 2, a $100 nominal GDP could be supported with a $50 money supply.

3. The equation of exchange, \( MV = PQ \), is an identity that shows that nominal GDP is equal to the money supply multiplied by the velocity of money. The quantity theory of money expresses a causal relationship: the price level is a function of the money supply, \( P = MV/Q \) where V and Q are assumed to be constant.

4. Real GDP will decrease since the aggregate expenditure curve will shift down. This is an example of the
paradox of thrift. At a lower level of real GDP, the transactions demand for money will be lower.

5. Panels A and B shown below depict the decrease in the money supply from S to S’, an increase in the interest rate from i to i’, and a decrease in the quantity of investment from I to I’. Panel C on the following page shows the aggregate demand curve shifting downward along the vertical portion of the aggregate supply curve to lower the price level to P’, thus reducing inflation.
Homework Questions

True-False Questions — If a statement is false, explain why.

1. The quantity theory of money predicts that when the money supply grows faster than real GDP, the price level will increase. (T/F)

2. Many societies over time have used gold as money in part because the supply of gold does not fluctuate dramatically from year to year. (T/F)

3. The Classical view of money demand is that there is a transactions demand for money in addition to the speculative and precautionary motives for holding money. (T/F)

4. A Keynesian would argue that an increase in the money supply can cause a decrease in the interest rate, which leads to a decrease in investment, and an increase in real GDP for an economy that is in equilibrium below full employment. (T/F)

5. The speculative demand for money is downward-sloping with respect to the interest rate because as the interest rate decreases, the opportunity cost of holding money decreases. (T/F)

Multiple-Choice Questions

1. Because velocity is greater than one, the M1 money supply is
   a. the same as GDP
   b. always increasing in order to match increases in GDP
   c. about half of GDP
   d. the same as the M2 money supply
   e. just over 12 percent of GDP

2. According to the quantity theory of money (and the Classical view), an increase in the money supply will lead to a(n)
   a. increase in interest rates and decrease in investment
   b. decrease in interest rates and increase in investment
   c. proportionate increase in the price level
   d. proportionate increase in real GDP
   e. increase in aggregate supply

3. According to Keynesians, an easy way to illustrate that velocity is not constant is to suppose people expect the price level to increase and begin to make purchases in advance. If the money supply is constant, then velocity will
   a. increase to accommodate the spending increase
   b. decrease to accommodate the spending increase
   c. decrease and the price level will increase
   d. decrease and the price level will decrease
   e. increase and the price level will decrease
4. As the interest rate decreases, the opportunity cost of holding money decreases, so people will hold more according to the
   a. investment demand for money
   b. precautionary motive for holding money
   c. speculative demand for money
   d. transaction demand for money
   e. concept of velocity

5. A view of the economy that allows for variability in the velocity of money, but that the equation of exchange is still a useful tool is likely that of
   a. a classical economist
   b. a monetarist
   c. a Keynesian
   d. a speculator
   e. a banker

**Discussion Questions/Problems**

1. Sketch the speculative demand for money and explain why it slopes down.

2. Should the money supply be allowed to grow? At what rate? How might the answer to this question differ between monetarists and Keynesians?