Chapter 11
Money and Monetary Policy
Macroeconomics In Context (Goodwin, et al.)

Chapter Overview

In this chapter, you will be introduced to a standard treatment of the banking system and monetary policy. You will learn about the role and functions of money, and about the role of the Federal Reserve. You will be introduced to the market for federal funds, and learn how the Federal Reserve attempts to expand or cool off the economy using monetary policy. You will also be introduced to the quantity equation, the quantity theory of money, and monetarism. In the Appendix you will be introduced to other approaches to understanding how monetary policy works, such as the more traditional money-supply-and-money-demand approach.

Chapter Objectives

After reading and reviewing this chapter, you should be able to:

1. Describe the functions of money and types of money.
2. Understand the basic workings of private and central banks.
3. Describe the tools the Federal Reserve can use to carry out monetary policy.
4. Understand how the Fed uses open market operations to influence the federal funds rate.
5. Explain how monetary policy is expected to affect investment and aggregate demand.
6. Understand the quantity equation, the quantity theory of money, and monetarism.
7. Describe possible sources of inflation.
8. Understand the controversy over rules versus activism in monetary policy.

If the Appendix is included:
9. Understand the relation of bond prices to interest rates
10. Describe the transactions demand model of money.
11. Understand the difference between real and nominal interest rates, and their impact on the economy.
12. Become familiar with the notions of “liquidity trap” and “credit rationing.”

Key Terms
barter financial intermediary
deflation bank reserves
liquidity required reserves
commodity money open market operations
fiat money monetary base
M1 high-powered money
money multiplier
discount rate
federal funds rate
prime bank rate
accelerator principle
expansionary monetary policy
accommodating monetary policy
contractionary monetary policy
quantity equation
velocity of money
quantity theory of money
monetary neutrality
money supply rule
monetarism

monetizing the deficit
Appendix:
bond
coupon amount
face value
maturity date
bond price
bond yield to maturity
transactions demand model
real interest rate
expected real interest rate
liquidity trap
credit rationing

Active Review

Fill in the Blank

1. The fact that money can be immediately used in exchange, whereas valuable jewelry
cannot, illustrates the fact that money is very ___________.

2. The measure of the money supply that includes currency in circulation, traveler’s
cHECKS, and checking accounts is called ___________.

3. The percentage of deposits that the Fed orders banks to keep in their vaults or in
deposits at the Fed are called ________________

4. When the Federal Open Market Committee (FOMC) directs the Federal Reserve Bank
in New York to buy or sell government bonds on the open market, it is conducting
_____________.

5. Suppose the Fed buys bonds on the open market. By doing so, it is increasing the
______________ (also known as ________________), which is the currency in circulation
plus bank reserves.

6. The ratio of the money supply to the monetary base is called the ________________,
and in the U.S. is empirically estimated to have a value close to two.

7. The interest rate that the Fed charges banks on overnight loans it makes to banks so
they can to meet their reserve requirements is called the ________________.

8. The idea that high GDP growth has a bigger impact on intended investment spending
than do interest rates, and thus leads to high investment growth is called the
______________.
9. In cases where inflation is a significant problem and the banking system is unstable, it is useful to use the ______________, which analyzes the relationships between the money supply, the velocity of money, the price level, and real output.

10. The theory that assumes that the velocity of money is constant in the equation $M \times V = P \times Y$ is the ________________.

11. When a central bank buys government debt as it is issued and thereby injects new money into the economy it is said to be ________________, which can trigger hyperinflation.

12. (Appendix) A financial instrument that commits its seller to pay a fixed amount every year, in addition to repaying the amount of the principal on a particular date in the future, in return for the loan of funds, is called a ________________.

13. (Appendix) The model of the money market which assumes that people need money balances for transactions, but forego earnings on the money balances they hold, is called the ________________.

14. (Appendix) The nominal interest rate minus inflation is the ________________.

15. (Appendix) When interest rates are so low that the Central Bank finds it impossible to lower them any further, the economy is in a ________________.

**True or False**

16. When a government finances its expenditures by printing money rather than collecting taxes, this can lead to “too much money chasing too few goods” and hyperinflation.

17. Coins and paper money have in some periods been commodity money and in other periods fiat money.

18. Nelson takes a $100 bill he had in his wallet and deposits it into his checking account. Thus, M1 increases by $100.

19. The most common monetary policy tool used by the Fed is changing the discount rate.

20. A contractionary or “tight” money policy entails a decrease (or fall in the growth rate of) the money supply, M1, leading to a lower interest rate.

21. When the Fed conducts open market operations, it is either trying to keep the federal funds rate at its existing level, or trying to push the federal funds rate up or down.
Short Answer

22. Why is inflation harmful to an economy?

23. Why is deflation harmful to an economy?

24. What are the three roles of money? And what are two types of money?

25. Identify the components of M1 and M2.

26. Describe the structure of the Federal Reserve. How many board of governors are there, and how long are their terms? Who appoints them? And how many regional banks does the Fed have?

27. Is the role (or function) of the Fed only to conduct monetary policy (e.g. raise or lower interest rates)?

28. Identify the three tools of monetary policy, and what the Fed would do to increase (or decrease) the (growth of the) money supply.

29. Explain the sequence of links connecting an expansionary monetary policy with interest rates, intended investment, aggregate demand, and output.

30. Suppose the economy is characterized by inflation problems and an unstable banking system. Use the quantity equation, \( M \times V = P \times Y \), to answer the following questions:
   a. What assumptions does the classical theory make about the variables in the quantity equation?
   b. What assumptions does monetarist theory make about the variables?
   c. What assumptions do Keynesian-oriented theories make?
d. How does monetarist theory use the quantity equation to explain the deflation and fall in output in the U.S. during the Great Depression?

e. How might a Keynesian-oriented theorist use the quantity equation to explain the cause of hyperinflation?

f. Provide two cases where inflation is caused by some factor other than an increase in the money supply

Problems

1. Jane Do has the following assets.

   $100 in her wallet
   $800 in her checking account
   $1,000 in her savings account
   A $20 traveler’s check from her last business trip to China.
   A $300 outstanding credit card bill.
   $3,000 in a small certificate of deposit
   A car worth $5,000.
   A house, worth $200,000.

   a. Identify which are in M1, which are in M2, or in neither M1 nor M2.

   b. Suppose she takes the $100 in her wallet and deposits it in her checking account. What is the change in M1 and M2?

   c. Suppose she takes $400 from her checking account and deposits it in her savings account. What is the change in M1 and M2?

2. Suppose the Fed buys $5 million worth of government bonds from TrustMe bank.


   b. How much in new loans can TrustMe Bank make, given this change in its balance sheet? (Assume the borrowers deposit the amount they borrow in other banks.)
c. Assume that when the new loans are deposited in other banks in the banking system, all these banks loan out all of their excess reserves. Assume further that the money multiplier equals 2. By how much has the money supply increased from the Fed’s bond purchase?

3. Suppose the Fed conducts an expansionary monetary policy. (Assume an economy with low inflation and a stable banking system). Illustrate graphically the effects of this expansionary monetary policy on:

a) The market for federal funds

b) Intended investment spending

c) Aggregate Demand and output

d) Suppose now that firms become pessimistic as they expect a fall in GDP and a fall in sales, such that the expansionary policy leaves no effect on aggregate demand and output. Illustrate graphically by re-doing the graphs in a-c above.
Self Test

1. Which of the following is not a reason why an unexpected bout of inflation is harmful to an economy?
   a. It wipes out the value of people’s savings.
   b. It hurts people on fixed incomes, such as retired people who receive non-indexed pensions.
   c. It redistributes wealth from debtors to creditors.
   d. It creates menu costs.
   e. It creates uncertainty, which makes financial planning for the future more difficult.

2. Why is deflation harmful to an economy, according to the textbook authors?
   a. It redistributes wealth from debtors to creditors.
   b. It creates menu costs
   c. It creates uncertainty, which makes financial planning for the future more difficult.
   d. It can lead to cutbacks in borrowing and spending, which can slow down the economy.
   e. All of the above.

3. Which of the following is the most liquid?
   a. A $20 bill in your pocket
   b. A gold necklace
   c. Three shares of Microsoft stock
   d. A certificate of deposit (CD) in your bank.
   e. A new Toyota Prius automobile

4. Which of the following is not one of the characteristics necessary for commodity money to be used as money?
   a. It must be durable.
   b. It must be portable.
   c. It must be generally acceptable.
   d. It must be differentiated.
   e. It must be scarce.
5. Which of the following is not included as “money” in M1?
   a. Currency in circulation
   b. Checkable deposits
   c. Traveler’s checks
   d. The use of a credit card
   e. The use of debit cards that take funds from a checking account

6. Suppose Tabatha takes $500 from her savings account and deposits it in her checking account. What is the change in M1 and M2?
   a. M1 increases and M2 decreases
   b. M1 increases and M2 remains unchanged
   c. M1 and M2 both increase
   d. M2 increases and M1 remains unchanged
   e. M1 and M2 both remain unchanged

7. Which of the following is not one of the functions of the Federal Reserve?
   a. Performing banking functions for private banks
   b. Issuing Treasury bills and bonds
   c. Regulating banks
   d. Promoting confidence and stability in the financial sector
   e. Conducting monetary policy.

8. An open market purchase by the Fed
   a. increases bank reserves, loans, and deposits, and thus increases the money supply.
   b. decreases bank reserves, loans, and deposits, and thus decreases the money supply.
   c. increases bank reserves, loans, and deposits, and thus decreases the money supply.
   d. decreases bank reserves, loans, and deposits, and thus increases the money supply.
   e. None of the above.

9. Suppose the Fed buys $15 million worth of government bonds from Richland bank. Which of the following is Richland Bank most likely to do?
   a. Reduce it’s outstanding loans by $15 million.
   b. Borrow more reserves at the “discount window”
   c. Borrow more reserves from other banks.
   d. Make new loans totaling about $15 million.
   e. None of the above
10. Suppose the Fed makes an open market purchase of $3 million. Assume that the money multiplier equals 2. What is the change in the money supply?

   a. The money supply has increased by $1.5 million.
   b. The money supply has increased by $6 million.
   c. The money supply had decreased by $1.5 million.
   d. The money supply has decreased by $6 million.
   e. None of the above.

11. Suppose the Fed makes an open market sale of $8 million in bonds. Assume the money multiplier is equal to 2. What is the change in the money supply?

   a. The money supply has increased by $4 million.
   b. The money supply has decreased by $4 million.
   c. The money supply has increased by $16 million.
   d. The money supply has decreased by $16 million.
   e. None of the above.

12. Which of the following is not one of the Fed’s monetary policy tools?

   a. Buying bonds on the open market
   b. Selling bonds on the open market
   c. Raising or lowering taxes
   d. Raising or lowering the reserve requirement ratio
   e. Raising or lowering the discount rate

13. Suppose the Fed wanted to engage in an expansionary monetary policy. Which of the following should it do?

   a. Sell bonds on the open market.
   b. Increase the reserve requirement ratio.
   c. Increase the discount rate.
   d. Buy bonds on the open market.
   e. Lower taxes.

14. The rate determined in the private market for overnight loans of reserves among banks is called the

   a. federal funds rate
   b. discount rate
   c. prime rate
   d. interest rate
   e. None of the above.
15. Which of the following best describes the sequence of events in the conduct of contractionary monetary policy using open market operations (in an economy with low inflation and a stable banking system)?

a. The Fed raises the interest rate, which leads to a decrease in intended investment spending and a decrease in the supply of federal funds, which decreases aggregate demand and output.
b. The Fed decreases intended investment spending, which leads to a decrease in aggregate demand and output, and a decrease in the supply of federal funds and the interest rate.
c. The Fed sells bonds, which decreases the supply of federal funds, which raises the interest rate, which leads to a decrease in intended investment spending, aggregate demand and output.
d. The Fed buys bonds, which increases the supply of federal funds, which lowers the interest rate, and leads to a decrease in intended investment spending and aggregate demand and output.
e. The Fed lowers the interest rate, which leads to an increase in intended investment spending and an increase in the supply of federal funds, which decreases aggregate demand and output.

16. What did the Federal Reserve do to expand the economy during the 2000-04 period?

a. It pushed down the federal funds rate.
b. It raised the reserve requirement ratio.
c. It raised the discount rate.
d. It sold bonds on the open market.
e. None of the above.

17. Which theory (or theories) assumes that the velocity of money is not constant, in the quantity equation $M \times V = P \times Y$?

a. Classical theory
b. Monetarist theory
c. Keynesian-influenced theories
d. The theory expounded by Milton Friedman and Anna Jacobson Schwartz
e. None of the above

18. Which of the following characterizes classical monetary theory?

a. Output is assumed to be always constant at its full-employment level.
b. Changes in the money supply have no effect on the level of real output, and thus money is assumed to be neutral.
c. An increase in the money supply can only lead to inflation.
d. The Fed should adopt a money supply rule, allowing the money supply to grow only at the same rate as real GDP.
e. All of the above.
For the next two questions, consider the following choices:

I. the Classical theory
II. Monetarism
III. Keynesian-oriented theories

19. Which of the above theories would be in agreement with the following statement? “The Fed should not use interventionist monetary policy, but should adopt a money supply rule such that the money supply is only allowed to grow at a steady rate -- the same rate as real GDP.”

a. I
b. II
c. III
d. I and II
e. I, II, and III

20. Which of the above theories would be in agreement with the following statement? “Inflation is always and everywhere a monetary phenomenon.”

a. I
b. II
c. III
d. I and II
e. I, II, and III

From Appendix:

21. Which of the following is not one of the potential problems of monetary policy?

a. long “outside lags”
b. long “inside lags”
c. disagreement over inflation and unemployment targets
d. liquidity traps
e. reluctant lenders and reluctant borrowers

22. What happens to bond prices and their interest rate when the Fed makes a sizeable open market purchase?

a. The price of bonds rises and their interest rate falls.
b. The price of bonds falls and their interest rate rises.
c. The price of bonds rises and their interest rate rises.
d. The price of bonds falls and their interest rate falls.
e. The price of bonds and their interest rate remain unchanged.
23. In the transactions demand model, what happens when the Fed engages in an expansionary monetary policy?

a. The money supply increases, driving up the interest rate.
b. The money supply increases, driving down the interest rate.
c. The money supply decreases, driving up the interest rate.
d. The money supply decreases, driving down the interest rate.
e. The money supply and the interest rate remain unchanged.

24. What is the difference between the nominal and real interest rate?

a. The nominal interest rate is the real interest rate minus the rate of inflation.
b. The real interest rate is the nominal rate plus the rate of inflation.
c. The real interest rate is the nominal rate minus the rate of inflation.
d. The nominal interest rate is the real interest rate plus the rate of inflation.
e. There is no difference between real and nominal interest rates.

25. A liquidity trap refers to a situation when

a. The economy is trapped by a flood of money on the market.
b. A rise in interest rates causes people to want to hold less money.
c. Households’ wealth becomes trapped in assets that cannot be easily exchanged into money.
d. The general public has a strong preference for holding the most liquid asset, money.
e. None of the above.

26. During a liquidity trap,

a. as the Fed increases the money supply, the interest rate falls significantly.
b. increases in the money supply have no effect on the interest rate, because the money demand curve has become perfectly horizontal.
c. as the Fed increases the money supply, the interest rate rises substantially.
d. once the Fed increases the money supply, it can no longer control it, which leads to hyperinflation.
e. monetary policy is highly effective in expanding the economy.
27. When credit rationing occurs,

a. banks keep their interest rates below what the market would bear, and deny loans to some potential borrowers.
b. Banks lend to only those customers deemed to be creditworthy and less risky.
c. Smaller and less well-known firms may be more disadvantaged than bigger firms with well-established reputations.
d. The Fed’s intended monetary policy actions may be limited or ineffective.
e. All of the above.

Answers to Active Review Questions

1. liquid
2. M1
3. required reserves
4. open market operations
5. monetary base, high-powered money
6. money multiplier
7. discount rate
8. accelerator principle
9. quantity equation
10. quantity theory of money
11. Monetizing the deficit
12. (Appendix) bond
13. (Appendix) transactions demand model
14. (Appendix) real interest rate
15. (Appendix) liquidity trap
16. True.
17. True.
18. False, M1 remains unchanged. There has just been a change in the composition of M1, but the size of M1 remains the same.
19. False. It is open market operations.
20. False. With “tight” policy, the interest rate rises.
21. True.
22. Inflation is harmful for the following reasons: it wipes out the value of people’s savings; it hurts people on fixed incomes; it redistributes wealth from creditors to debtors; it creates menu costs; and it creates uncertainty, which makes financial planning for the future more difficult.
23. Deflation is a problem because: it redistributes wealth from debtors to creditors, it creates menu costs; it creates uncertainty, which makes financial planning for the future more difficult; and it can lead to cutbacks in borrowing and spending, which can slow down the economy.
24. The three roles of money are: medium of exchange, store of value, and unit of account. Two types of money are commodity money and fiat money. Commodity money is a good that is used as money that is also valuable in itself. Fiat money is a
medium of exchange used as money because the government declares it as such and people accept it.

25. M1 consists of currency in circulation, traveler’s checks, and checkable deposits. M2 consists of all of M1, plus savings accounts, and other funds such as small certificates of deposit and retail money market funds.

26. The Fed’s board of governors has seven members who serve fourteen-year terms. They are nominated by the president and approved by the Senate, and one member of the board is named as chair. There are also 12 regional Federal Reserve banks.

27. No, the Fed is supposed to do more than that. It’s roles include: performing banking functions for private banks; determining reserve requirements; stabilizing exchange rates; regulating banks; promoting confidence and stability in the banking sector; as well as conducting monetary policy.

28. To increase the (growth of the) money supply, the Fed could either buy bonds, lower the reserve requirement ratio, or lower the discount rate. To decrease the (growth of the) money supply, the Fed could either sell bonds, raise the reserve requirement ratio, or raise the discount rate.

29. An expansionary monetary policy will lower interest rates, which tends to encourage intended investment, leading to an increase in aggregate demand and output (GDP).

30.

a. Classical theory assumes that velocity is constant, and that the economy is always constant at the full employment level of income.

b. Monetarism also assumes that velocity is constant, but relaxes the assumption that the economy is always constant at full employment, and believes that output can fall with bad monetary policy.

c. Keynesian-oriented theories assume none of the variables (in particular neither velocity or output) are constant.

d. The monetarists thought that the bad monetary policy of decreasing the money supply caused both a drop in the price level (deflation) and a fall in output during the Great Depression.

e. A dramatic rise in the money supply (especially if the central bank is monetizing deficits) and/or the velocity of money could trigger hyperinflation.

f. Inflation could be caused by an increase in the velocity of money, or by due to imports whose prices have risen.

Answers to Problems

1.

a. The following are in M1, M2, or neither:
   $100 in her wallet = M1
   $800 in her checking account = M1
   $1,000 in her savings account = M2
   A $20 traveler’s check from her last business trip to China = M1
   A $300 outstanding credit card bill = Neither
   $3,000 in a small certificate of deposit = M2
   A car worth $5,000 = Neither
A house, worth $200,000 = Neither
b. M1 and M2 remain unchanged.
c. M1 decreases by $400, and M2 remains unchanged.

2. Suppose the Fed buys $5 million worth of government bonds from TrustMe bank.  
a. The changes in the Fed’s Balance sheet are:

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government bonds</td>
<td>$+ 5 million</td>
</tr>
<tr>
<td>Bank reserves</td>
<td>$+ 5 million</td>
</tr>
</tbody>
</table>

(b) The changes in TrustMe bank’s balance sheet are:

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government bonds</td>
<td>$- 5 million</td>
</tr>
<tr>
<td>Reserves</td>
<td>$+ 5 million</td>
</tr>
</tbody>
</table>

b. $5 million
c. $5 million × 2 = $10 million

3. Effects of an expansionary monetary policy:
a.
b. Graph b would now look as follows, as the drop in confidence leads to a fall in sales: Graph a would remain the same, as above.

c. d. If firms become pessimistic as they expect a fall in GDP and a fall in sales:
Graph a would remain the same, as above.
Graph b would now look as follows, as the drop in confidence leads to a fall in \( II_0 \) to \( II_1 \), so intended investment spending remains at its original level:
Graph c would now look like as follows, where AD remains unchanged, but at the lower interest rate:
Answers to Self Test Questions

1. C
2. E
3. A
4. D
5. D
6. B
7. B
8. A
9. D
10. B
11. D
12. C
13. D
14. A
15. C
16. A
17. C
18. E
19. D
20. D

From appendix:

21. B
22. A
23. B
24. C
25. D
26. B
27. E