Chapter 13: Exchange Rates, Business Cycles, and Macroeconomic Policy in the Open Economy

Questions Worksheet with Answer Space

REVIEW QUESTIONS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. Define *nominal exchange rate* and *real exchange rate*. How are changes in the real exchange rate and the nominal exchange rate related?

2. What are the two main types of exchange-rate systems? Currently, which type of system determines the values of the major currencies, such as the dollar, yen, and euro?

3. Define *purchasing power parity*, or PPP. Does PPP work well empirically? Explain.

4. What is the J curve? What explains the behavior of net exports represented by the J curve?

5. For a given real exchange rate, how are a country's net exports affected by an increase in domestic income? An increase in foreign income? How does an increase in the domestic real interest rate affect the real exchange rate and net exports?

6. Why do foreigners demand dollars in the foreign exchange market? Why do U.S. residents supply dollars to the foreign exchange market? Give two examples of changes that would lead to an increased demand for dollars and two examples of changes that would lead to an increased supply of dollars in the foreign exchange market.

7. How does the IS–LM model for an open economy differ from the IS–LM model for a closed economy? Illustrate the use of the open-economy IS–LM model in describing how a recession in one country may be transmitted to other countries.

8. How are net exports affected by expansionary fiscal policy? By expansionary monetary policy? What is the potential ambiguity in determining these effects?

9. What effects does expansionary monetary policy have on the nominal exchange rate in both the short and long run? Explain.

10. What is the *fundamental value* of a currency? What does saying that a currency is *overvalued* mean? Why is an overvalued currency a problem? What can a country do about an overvalued currency?

11. Why is a country limited in changing its money supply under a fixed-exchange-rate system? Explain how policy coordination among countries in a fixed-exchange-rate system can increase the degree to which monetary policy may be used to pursue macroeconomic goals.

12. Discuss the relative advantages and disadvantages of flexible exchange rates, fixed exchange rates, and a currency union.

NUMERICAL PROBLEMS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. West Bubble makes ordinary soap bars that are sold for 5 guilders each. East Bubble makes deluxe soap bars that are sold for 100 florins each. The real exchange rate between West and East Bubble is two ordinary soap bars per deluxe soap bar.

   a. What is the nominal exchange rate between the two countries?

   b. During the following year West Bubble has 10% domestic inflation and East Bubble has 20% domestic inflation. Two ordinary soap bars are still traded for a deluxe soap bar. At the end of the year, what has happened to the nominal exchange rate? Which country has had a nominal appreciation? Which has had a nominal depreciation?

2. Japan produces and exports only cameras, and Saudi Arabia produces and exports only barrels of oil. Initially, Japan exports 40 cameras to Saudi Arabia and imports 64 barrels of oil. The real exchange rate is 4 barrels of oil per camera. Neither country has any other trading partners.

   a. Initially, what is the real value of Japan's net exports, measured in terms of its domestic good? (*Hint*: You have to use the real exchange rate to express Japan's oil imports in terms of an equivalent number of cameras. Then calculate Japan's net exports as the number of cameras exported minus the real value of its imports in terms of cameras.)

   b. The real exchange rate falls to 3 barrels of oil per camera. Although the decline in the real exchange rate makes oil more expensive in terms of cameras, in the short run there is relatively little change in the quantities of exports and imports, as Japan's exports rise to 42 cameras and its imports fall to 60 barrels of oil. What has happened to the real value of Japan's net exports?

c. In the longer run, quantities of exports and imports adjust more to the drop in the real exchange rate from 4 to 3, and Japan's exports rise to 45 cameras and its imports of oil fall to 54 barrels. What are Japan's real net exports now?

d. Relate your answers to Parts (b) and (c) to the J-curve concept.

3. Consider the following classical economy:

Desired consumption	$C^d = 300 + 0.5Y - 200r.$
Desired investment	$I^d = 200 - 300r.$
Government purchases	$G = 100.$
Net exports	$NX = 150 - 0.1Y - 0.5e.$
Real exchange rate	$e = 20 + 600r.$
Full-employment output	$\bar{Y} = 900.$

a. What are the equilibrium values of the real interest rate, real exchange rate, consumption, investment, and net exports?

b. Now suppose that full-employment output increases to 940. What are the equilibrium values of the real interest rate, real exchange rate, consumption, investment, and net

exports?

c. Suppose that full-employment output remains at 940 and that government purchases increase to 132. What are the equilibrium values of the real interest rate, real exchange rate, consumption, investment, and net exports?

4. Consider the following Keynesian economy:

Desired consumption	$C^d = 200 + 0.6(Y - T) - 200r.$
Desired investment	$I^d = 300 - 300r.$
Taxes	$T = 20 + 0.2Y.$
Government purchases	$G = 152.$
Net exports	$NX = 150 - 0.08Y - 500r.$
Money demand	$L = 0.5Y - 200r.$
Money supply	$M = 924.$
Full-employment output	$\bar{Y} = 1000.$

a. What are the general equilibrium (that is, long-run) values of output, the real interest rate, consumption, investment, net exports, and the price level?

b. Starting from full employment, government purchases are increased by 62, to 214. What are the effects of this change on output, the real interest rate, consumption, investment, net exports, and the price level in the short run? In the long run?

c. With government purchases at their initial value of 152, net exports increase by 62 at any income and real interest rate, so that $NX = 212 - 0.08Y - 500r$. What are the effects of this change on output, the real interest rate, consumption, investment, net exports, and the price level in the short run? In the long run? Compare your answer to that for Part (b).

5. Consider the following classical economy:

$$\begin{aligned} AD \qquad & Y = 400 + 50M/P. \\ AS \qquad & Y = \bar{Y} = 1000. \end{aligned}$$

This economy produces only wine, its output is measured in terms of wine, and its currency is francs. It trades with a country that produces only cheese and the currency of that country is crowns. The real exchange rate, e, equals 5 wedges of cheese per bottle of wine. The foreign price level is 20 crowns per wedge of cheese, and the domestic money supply is 48 francs.

a. What is the domestic price level? What is the fundamental value of the (nominal) exchange rate?

b. Suppose that the domestic country fixes its exchange rate at 50 crowns per franc. Is its currency overvalued, undervalued, or neither? What will happen to the domestic central

bank's stock of official reserve assets if it maintains the exchange rate at 50 crowns per franc?

c. Suppose that the domestic country wants a money supply level that equalizes the fundamental value of the exchange rate and the fixed rate of 50 crowns per franc. What level of money supply achieves this goal? (*Hint*: For the given real exchange rate and foreign price level, what domestic price level is consistent with the official rate? What domestic money supply level will yield this price level?)

6. (Appendix 13.B)

a. For the economy described in Numerical Problem 4, find the values of all the parameters of Eqs. (13.B.1), (13.B.2), and (13.B.3). Use Eqs. (13.B.8) and (13.B.9) to derive the open-economy IS curve for this economy.

b. Derive the LM curve for this economy.

c. Find output, the real interest rate, and the price level when the economy is in general equilibrium.

d. Derive the AD curve for this economy. Suppose that net exports increase by 62 at any given level of domestic output and domestic interest rate. How is the AD curve affected?

e. Find the effect of the increase in net exports on output in this economy, assuming that the short-run price level is fixed at the general equilibrium value you found in Part (c). (*Hint*: This assumption is equivalent to assuming that the SRAS curve is horizontal.)

ANALYTICAL PROBLEMS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. Recessions often lead to calls for protectionist measures to preserve domestic jobs. Suppose that a country that is in a recession imposes restrictions that sharply reduce the amount of goods imported by the country.

   a. Using the Keynesian IS–LM model, analyze the effects of import restrictions on the domestic country's employment, output, real interest rate, and real exchange rate, keeping in mind that the country is initially in a recession.

   b. What are the effects of the country's action on foreign employment, output, real interest rate, and real exchange rate? What happens if the foreign country retaliates by imposing restrictions on goods exported by the domestic country?

   c. Suppose that the domestic country is at full employment when it imposes restrictions on imports. Using the basic classical model without misperceptions, find the effects on the country's employment, output, real interest rate, and real exchange rate.

2. Use the classical IS–LM model for two countries to analyze the idea that the United States became a relatively more attractive place to invest in the early 1980s. Assume that, because of more favorable tax laws, the user cost of capital falls in the domestic country and that, because of the LDC debt crisis, the expected future marginal product of capital falls in the foreign country. Show that these changes lead to an appreciation of the home country's real

exchange rate and a drop in the domestic country's net exports. Assume no change in current productivity or current labor supply in either country. What is happening to financial flows? Why?

3. East Bubble's main trading partner is West Bubble. To fight inflation, West Bubble undertakes a contractionary monetary policy.

   a. What is the effect of West Bubble's contractionary monetary policy on East Bubble's real exchange rate in the short run, assuming no change in East Bubble's policies? In the long run? Use the Keynesian model with flexible exchange rates.

   b. What is the effect of West Bubble's monetary contraction on East Bubble's nominal exchange rate in the short run and in the long run?

   c. Suppose now that East Bubble has fixed its exchange rate with West Bubble. If East Bubble wants to keep the exchange rate equal to its fundamental value, how will East Bubble have to respond to West Bubble's monetary tightening? What will happen to East Bubble's output, real exchange rate, and net exports in the short run if it maintains the fixed exchange rate at its fundamental value? Compare your answer to that for Part (a).

d. Suppose that, after West Bubble's monetary tightening, East Bubble decides not to change any of its own macroeconomic policies (the exchange rate is still fixed). What will happen? Describe some alternative scenarios.

4. Use a diagram like that in Fig. 13.7a to analyze the effect on a country's net exports of a beneficial supply shock that temporarily raises full-employment output by 100 per person. Assume that the basic classical model applies so that income is always at its full-employment level.

   a. Suppose that, in response to the temporary increase in income, the residents of the country do not change the amount they desire to spend at any real interest rate (on either domestic or foreign goods). What is the effect of the temporary supply shock on the country's net exports? (*Hint*: What is the effect of the increase in income on the curve representing desired saving minus desired investment? What is the effect on the curve representing net exports?)

   b. Now suppose that, in response to the temporary increase in income, the residents of the country increase their desired spending at any real interest rate by 100 per person. A portion of this increased spending is for foreign-produced goods. What is the effect on the country's net exports?

c. More difficult: If the increase in income is temporary, would the spending behavior assumed in Part (a) or the spending behavior assumed in Part (b) be more likely to occur? Based on your answer, do the results of this problem confirm or contradict the prediction of the model in Chapter 5 of the response of net exports to a supply shock? Explain.

Chapter 14: Monetary Policy and the Federal Reserve System

Questions Worksheet with Answer Space

REVIEW QUESTIONS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. Define *monetary base*. What is the relationship between the monetary base and the money supply in an all-currency economy?

2. Define *money multiplier*. What is the value of the money multiplier in a system of 100% reserve banking? What is the value of the money multiplier in a system of fractional reserve banking, if all money is held in the form of deposits? Why is the money multiplier higher under fractional reserve banking than under 100% reserve banking?

3. Discuss how actions of the public and banks can cause the money multiplier to rise or fall. Does the fact that the public and banks can affect the money multiplier imply that the central bank cannot control the money supply? Why or why not?

4. What is the effect on the monetary base of an open-market purchase of U.S. Treasury securities? What is the effect on the money supply?

5. Who determines monetary policy in the United States? What role does the President play?

6. Besides open-market operations, what other means does the Federal Reserve have for controlling the money supply? Explain how these alternative methods work.

7. What are intermediate targets? How do they differ from monetary policy goals? List the two principal types of intermediate targets that the Fed has used.

8. What are the three channels of monetary policy? Explain each channel briefly.

9. "It is plain to see that discretion is a better way to run monetary policy than following a rule because a policy of discretion gives the central bank the ability to react to news about

the economy." What is the monetarist response to this statement? What is the more recent argument for using rules rather than discretion?

10. Has the use of money-growth targets significantly improved central bank credibility? Besides adopting money-growth targets, what other actions can a country take to increase the credibility of its central bank?

NUMERICAL PROBLEMS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. The Agricolan monetary base is 1,000,000 florins. The public always holds half its money supply as currency and half as deposits. Banks hold 20% of deposits in the form of reserves. Starting with the initial creation of a monetary base that accompanies the purchase by the central bank of 1,000,000 fl worth of coconuts from the public, show the consolidated balance sheet of the banks after they first receive deposits, after a first round of loans and redeposits, and after a second round of loans and redeposits. (*Hint*: Don't forget that the public keeps only half its money in the form of bank deposits.)

   Show the balance sheets of the central bank, the banking system, and the public at the end of the process of multiple expansion of loans and deposits. What is the final value of the money supply?

2. a. The money supply is $6,000,000, currency held by the public is $2,000,000, and the reserve–deposit ratio is 0.25. Find deposits, bank reserves, the monetary base, and the money multiplier.

   b. In a different economy, vault cash is $1,000,000, deposits by depository institutions at the central bank are $4,000,000, the monetary base is $10,000,000, and bank deposits are $20,000,000. Find bank reserves, the money supply, and the money multiplier.

3. When the real interest rate increases, banks have an incentive to lend a greater portion of their deposits, which reduces the reserve–deposit ratio. In particular, suppose that

$$res = 0.4 - 2r,$$

where res is the reserve–deposit ratio and r is the real interest rate. The currency–deposit ratio is 0.4, the price level is fixed at 1.0, and the monetary base is 60. The real quantity of money demanded is

$$L(Y, i) = 0.5Y - 10i,$$

where Y is real output and i is the nominal interest rate. Assume that expected inflation is zero so that the nominal interest rate and the real interest rate are equal.

a. If $r = i = 0.10$, what are the reserve–deposit ratio, the money multiplier, and the money supply? For what real output, Y, does a real interest rate of 0.10 clear the asset market?

b. Repeat Part (a) for $r = i = 0.05$.

c. Suppose that the reserve–deposit ratio is fixed at the value you found in Part (a) and isn't affected by interest rates. If $r = i = 0.05$, for what output, Y, does the asset market clear in this case?

d. Is the LM curve flatter or steeper when the reserve–deposit ratio depends on the real interest rate than when the reserve–deposit ratio is fixed? Explain your answer in economic terms.

4. This question asks you to analyze a game played by two players, player I and player II. Player I can choose one of two actions, A and B. Player II also has two actions from which to choose, a and b. Both players are affected by their own action and by the action of the other player. The points that each player assigns to each possible outcome (combination of actions) are shown in the following table:

Outcome	Points for Player I	Points for Player II
(A, a)	2	2
(A, b)	5	0
(B, a)	0	5
(B, b)	3	3

The first row indicates that, if player I chooses action A and player II chooses action a, player I gets 2 points and player II gets 2 points. The more points a player gets, the happier she is with the outcome. Players don't care about how many points the other player gets.

a. If player I moves (chooses an action) first and then player II moves, what action will each player take? (Set up a game theory diagram like that shown in Fig. 14.9.) What is the outcome of the game? Does your answer change if player II moves first?

b. Suppose that player I moves first, but before player I moves, player II announces which action (a or b) she will take when it is her turn. Player II's announcement is legally binding. What is the outcome of the game now?

c. Before player I makes the first move, player II is allowed to make a threat, telling player I what action she will take on her turn if player I chooses A and what action she will take if player I chooses B. Player II's threats are legally binding. What is the outcome of the game now? Is player I made worse off or better off by player II's ability to threaten her?

ANALYTICAL PROBLEMS

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1. How would each of the following affect the U.S. money supply? Explain.

   a. Banks decide to hold more excess reserves. (Excess reserves are reserves over and above what banks are legally required to hold against deposits.)

   b. People withdraw cash from their bank accounts for Christmas shopping.

   c. The Federal Reserve sells gold to the public.

   d. The Federal Reserve begins to pay interest on deposits of depository institutions held at the Fed (it currently doesn't pay interest).

   e. The introduction of automatic teller machines, which allow people to withdraw cash from the bank as needed, makes deposits relatively more convenient.

   f. The Federal government sells $20 billion of new government bonds to the Federal Reserve.

The proceeds of the sale are used to pay government employees.

g. The Federal Reserve sells some of its government securities in Tokyo for yen.

2. Suppose that the Fed were committed to following the Taylor rule, given in Box 14.2, p. 554. For each of the following types of shocks, determine whether the use of the Taylor rule would tend to be stabilizing or destabilizing, or would have an ambiguous effect, relative to a policy of leaving the money supply unchanged. Consider the behavior of both output and inflation.

   a. An increase in money demand.

   b. A temporary increase in government purchases.

   c. An adverse supply shock.

   d. A decline in consumer confidence.

e. An increase in export demand.

3. In the game between the Fed and the firms shown diagrammatically in Fig. 14.10(b), what happens if the Fed doesn't value having the unemployment rate below the natural rate, $\bar{u}$? Specifically, assume that the Fed assigns 0 points to a situation in which u equals $\bar{u}$ and assigns -1 points to a situation in which u is either above or below $\bar{u}$. How does this modification affect the outcome of the game? (Assume that if the Fed is indifferent between two actions, it chooses the one that makes the firms better off.)

4. Why do many governments have policies against negotiating with hostage-taking terrorists? Under what conditions, if any, are such policies likely to reduce hostage taking? Discuss the analogy to monetary rules.

Chapter 15: Government Spending and Its Financing

Questions Worksheet with Answer Space

REVIEW QUESTIONS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. What are the major components of government outlays? What are the major sources of government revenues? How does the composition of the Federal government's outlays and revenues differ from that of state and local governments?

2. Explain the difference between the overall government budget deficit and the primary deficit. Why are two deficit concepts needed?

3. How is government debt related to the government deficit? What factors contribute to a large change in the debt–GDP ratio?

4. What are the three main ways that fiscal policy affects the macroeconomy? Explain briefly how each channel of policy works.

5. Define *automatic stabilizer* and give an example. For proponents of antirecessionary fiscal policies, what advantage do automatic stabilizers have over other types of taxing and spending policies?

6. Give a numerical example that shows the difference between the average tax rate and the marginal tax rate on a person's income. For a constant before-tax real wage, which type of tax rate most directly affects how wealthy a person feels? Which type of tax rate affects the reward for working an extra hour?

7. Why do economists suggest that tax rates be kept roughly constant over time, rather than alternating between high and low levels?

8. In what ways is the government debt a potential burden on future generations? What is the relationship between Ricardian equivalence and the idea that government debt is a burden?

9. Discuss four reasons why the Ricardian equivalence proposition isn't likely to hold exactly.

10. Define *inflation tax* (also called *seignorage*). How does the government collect this tax, and who pays it? Can the government always increase its real revenues from the inflation tax by increasing money growth and inflation?

NUMERICAL PROBLEMS

Questions marked with a brown circle are available in MyEconLab at `www.myeconlab.com`.

1. The following budget data are for a country having both a central government and provincial governments:

Central purchases of goods and services	200
Provincial purchases of goods and services	150
Central transfer payments	100
Provincial transfer payments	50
Grants in aid (central to provincial)	100
Central tax receipts	450
Provincial tax receipts	100
Interest received from private sector by central government	10
Interest received from private sector by provincial governments	10
Total central government debt	1000
Total provincial government debt	0
Central government debt held by provincial governments	200
Nominal interest rate	10%

   Calculate the overall and primary deficits for the central government, the provincial governments, and the combined governments.

2. Congress votes a special one-time $1 billion transfer to bail out the buggy whip industry. Tax collections don't change, and no change is planned for at least several years. By how much will this action increase the overall budget deficit and the primary deficit in the year that the transfer is made? In the next year? In the year after that? Assume that the nominal interest rate is constant at 10%.

3. Because of automatic stabilizers, various components of the government's budget depend on the level of output, Y. The following are the main components of that budget:

Tax revenues	$1000 + 0.1Y$
Transfers	$800 - 0.05Y$
Government purchases	1800
Interest payments	100

Full-employment output is 10,000. Find the actual budget deficit and the full-employment budget deficit for

a. $Y = 12{,}000$.

b. $Y = 10{,}000$.

c. $Y = 8000$.

In general, how does the relationship between the actual deficit and the full-employment deficit depend on the state of the economy?

4. Suppose that the income tax law exempts income of less than \$8000 from the tax, taxes income between \$8000 and \$20,000 at a 25% rate, and taxes income greater than \$20,000 at a 30% rate.

   a. Find the average tax rate and the marginal tax rate for someone earning \$16,000 and for someone earning \$30,000.

   b. The tax law is changed so that income of less than \$6000 is untaxed, income from \$6000 to \$20,000 is taxed at 20%, and income of more than \$20,000 continues to be taxed at 30%. Repeat Part (a).

   c. How will the tax law change in Part (b) affect the labor supply of the person initially making \$16,000? How will it affect the labor supply of the person making \$30,000?

5. Suppose that all workers value their leisure at 90 goods per day. The production function

relating output per day, Y, to the number of people working per day, N, is

$$Y = 250N - 0.5N^2.$$

Corresponding to this production function, the marginal product of labor is

$$MPN = 250 - N.$$

a. Assume that there are no taxes. What are the equilibrium values of the real wage, employment, N, and output, Y? (*Hint*: In equilibrium the real wage will equal both the marginal product of labor and the value of a day's leisure to workers.)

b. A 25% tax is levied on wage income. What are the equilibrium values of the real wage, employment, and output? In terms of lost output, what is the distortion cost of this tax?

c. Suppose that the tax on wages rises to 50%. What are the equilibrium values of the real wage, employment, and output? In terms of lost output, what is the distortion cost of this higher tax rate? Compare the distortion caused by a 50% tax rate with that caused by a 25% tax rate. Is the distortion caused by a 50% tax rate twice as large, more than twice as large, or less than twice as large as that caused by a 25% tax rate? How does your answer relate to the idea of tax smoothing?

6. Find the largest nominal deficit that the government can run without raising the debt–GDP ratio, under each of the following sets of assumptions:

   a. Nominal GDP growth is 10% and outstanding nominal debt is 1000.

   b. Real GDP is 5000 and remains constant, nominal GDP is initially 10,000, inflation is 5%, and the debt–GDP ratio is 0.6.

7. In this problem you are asked to analyze the question: By issuing new bonds and using the proceeds to pay the interest on its old bonds, can government avoid ever repaying its debts?

   a. Suppose that nominal GDP is \$1 billion and the government has \$100 million of bonds outstanding. The bonds are one-year bonds that pay a 7% nominal interest rate. The growth rate of nominal GDP is 5% per year. Beginning now the government runs a zero primary deficit forever and pays interest on its existing debt by issuing new bonds. What is the current debt–GDP ratio? What is this ratio after 1, 2, 5, and 10 years? Suppose that, if the debt–GDP ratio exceeds one, the public refuses to buy additional government bonds. Will the debt–GDP ratio ever reach that level? Will the government someday have to run a primary surplus to repay its debts, or can it avoid repayment forever? Why?

   b. Repeat Part (a) for nominal GDP growth of 8% per year and a nominal interest rate on government bonds of 7% per year.

8. Real money demand in an economy is

$$L = 0.2Y - 500i,$$

where Y is real income and i is the nominal interest rate. In equilibrium, real money demand, L, equals real money supply, M/P. Suppose that Y is 1000 and the real interest rate, r, is 0.04.

a. Draw a graph with real seignorage revenue on the vertical axis and inflation on the horizontal axis. Show the values of seignorage for inflation rates of 0, .02, .04, .06, . . ., .30.

b. What inflation rate maximizes seignorage?

c. What is the maximum amount of seignorage revenue?

d. Repeat Parts (a)–(c) for $Y = 1000$ and $r = 0.08$.

9. Consider an economy in which the money supply consists of both currency and deposits. The growth rate of the monetary base, the growth rate of the money supply, inflation, and expected inflation all are constant at 10% per year. Output and the real interest rate are constant. Monetary data for this economy as of January 1, 2007, are as follows:

Currency held by nonbank public	\$200
Bank reserves	\$50
Monetary base	\$250
Deposits	\$600
Money supply	\$800

a. What is the nominal value of seignorage over the year? (*Hint*: How much monetary base is created during the year?)

b. Suppose that deposits and bank reserves pay no interest, and that banks lend deposits not held as reserves at the market rate of interest. Who pays the inflation tax (measured in nominal terms), and how much do they pay? (*Hint*: The inflation tax paid by banks in this example is negative.)

c. Suppose that deposits pay a market rate of interest. Who pays the inflation tax, and how much do they pay?

ANALYTICAL PROBLEMS

1. Why is some state and local spending paid for by grants in aid from the Federal government instead of entirely through taxes levied by states and localities on residents? What are the advantages and disadvantages of a system of grants in aid?

2. Using the *Economic Report of the President*, compare the Federal government's budget in 1979, 1992, 2000, and 2004. Express the main components of Federal spending and receipts in each year as fractions of GDP. Were the increased deficits between 1979 and 1992 more the result of increased spending or reductions in revenues? What accounts for the decrease in the deficit between 1992 and 2000? What accounts for the increase in the deficit between 2000 and 2004?

3. Both transfer programs and taxes affect incentives. Consider a program designed to help the poor that promises each aid recipient a minimum income of $10,000. That is, if the recipient earns less than $10,000, the program supplements his income by enough to bring him up to $10,000.

   Explain why this program would adversely affect incentives for low-wage recipients. (*Hint*: Show that this program is equivalent to giving the recipient $10,000, then taxing his labor income at a high marginal rate.) Describe a transfer program that contains better incentives. Would that program have any disadvantages? If so, what would they be?

4. a. Use the fact that the nominal deficit equals the nominal primary deficit plus nominal interest payments on government debt to rewrite equation (15.4) showing the change in the debt–GDP ratio as a function of the ratio of the primary deficit to GDP, the ratio of debt to GDP, and the difference between the growth rate of nominal GDP and the nominal interest rate.

   b. Show that, if the primary deficit is zero, the change in the debt–GDP ratio equals the product of (1) the debt–GDP ratio and (2) the excess of the real interest rate over the growth rate of real GDP.

5. A constitutional amendment has been proposed that would force Congress to balance the budget each year (that is, outlays must equal revenues in each year). Discuss some advantages and disadvantages of such an amendment. How would a balanced-budget amendment affect the following, if in the absence of such an amendment the Federal government would run a large deficit?

a. The use of automatic stabilizers.

b. The ability of Congress to "smooth" taxes over time.

c. The ability of Congress to make capital investments.