Eastern Mediterranean University
Department of Economics
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Intermediate Macroeconomics
ECON202

Solutions to Questions and Problems
Chapter 5
Questions

2. The *cyclical deficit* occurs because of a business cycle. It is the difference between the *actual budget deficit* and the *natural employment deficit*. The *structural deficit* is the deficit that remains after the effect of the business cycle is separated out. A *structural deficit* is the deficit that exists when the economy is at the natural level of output; it is identical to the *natural employment deficit*. The *actual budget deficit* is the deficit that exists given the actual tax receipts and the actual level of government spending. It is the sum of the *natural employment deficit* and the *cyclical deficit*.

6. Unlike earlier postrecession periods such as 1958–60, 1961–69, 1971–73 and 1976–79, the budget deficits during the periods 1983–95 and 2002–04 did not disappear. The top frame of Figure 5.1 on page 133 indicates that the deficits persisted during the period 1983–95 because government's revenues and expenditures rose at about the same rate. The deficits rose during 2002–2004 because government's revenues fell more rapidly than its expenditures.

9. If taxes are increased, then national saving increases. In a closed economy, that increase drives down the interest rate, resulting in a fall in private saving, but a rise in domestic investment. Since the economy is closed, there are no net exports or foreign borrowing.

   In a small open economy, the foreign and domestic interest rates are not affected by the increase in national saving. Therefore the increase in national saving has no impact on private saving and domestic investment. But since national saving has increased, net exports increase by the amount of the increase in national saving. Therefore, foreign borrowing decreases by the amount of the increase in net exports.

   In a large open economy, the increase in national saving drives down both domestic and foreign interest rates. That decreases private saving and increases domestic investment. The increase in domestic investment is less than the increase in national saving, which means that net exports rise and foreign borrowing declines.

Problems

2. (a) The amount of taxes at actual real GDP equals $0.16(10{,}600) = 1{,}696$, whereas the amount of taxes at natural real GDP equals $0.16(10{,}900) = 1{,}744$.

   (b) The amount of the natural employment deficit equals $1{,}744 - 1{,}890 = -146$.

   (c) The amount of the actual deficit equals $1{,}696 - 1{,}890 = -194$. Since actual real GDP is less than natural real GDP, there is a cyclical deficit. Since the actual deficit is the sum of the cyclical and natural employment deficits, the cyclical deficit equals the actual deficit minus the natural employment deficit, which equals $-194 - (-146) = -48$.

   (d) Taxes now equal $0.14\,(10{,}900) = 1{,}526$ at natural real GDP.

   (e) The amount of the new natural employment deficit equals $1{,}526 - 1{,}890 = -364$. The natural employment and actual deficits are now equal because the economy is now operating at natural real GDP. That is also why there is neither a cyclical deficit nor a cyclical surplus.

   (f) Since monetary, as opposed to fiscal policy, is used to increase output to natural real GDP, the natural employment deficit is the same as it was in part (b). As in part (e), the natural employment and actual deficits are now equal because the economy is now operating at natural real GDP. The reason that the natural employment deficits are different between parts (e) and (f) is that a change in fiscal policy changes the amount of the natural employment deficit or surplus, whereas a change in monetary policy does not.

3. (a) National saving equals private saving plus the government deficit or $S + (T - G) = 1{,}750 + 75r - 350 = 1{,}400 + 75r$.

(b) Setting the equation for investment demand equal to the equation for national saving yields $2{,}400 - 125r = 1{,}400 + 75r$. Adding $125r$ to and subtracting 1,400 from both sides yields $200r = 1{,}000$ or r equals 5. Substituting $r = 5$ into the equations for investment demand, private saving, and national saving shows that investment demand equals 1,775, private saving equals 2,125 and national saving equals 1,775.

(c) If the government deficit is cut by 200 billion, then the new equation for national saving is $1{,}400 + 75r + 200 = 1{,}600 + 75r$. Setting the equation for investment demand equal to the equation for national saving yields $2{,}400 - 125r = 1{,}600 + 75r$. Adding $125r$ to and subtracting 1,600 from both sides yields $200r = 800$ or r equals 4. Substituting $r = 4$ into the equations for investment demand, private saving, and national saving shows that investment demand equals 1,900, private saving equals 2,050, and national saving equals 1,900.

(d) The cut in the government deficit leads to an increase in national saving and a fall in the interest rate. The lower interest rate causes an increase in investment demand and a drop in private saving.

Chapter 6

Questions

3. (a) Credit; current account; decreases U.S. balance of payments deficit.

(b) Debit; capital account; increases U.S. balance of payments deficit.

(c) Credit; capital account; decreases U.S. balance of payments deficit.

(d) Debit; current account; increases U.S. balance of payments deficit.

6. The demand for a country's currency by foreigners (foreign exchange) is negatively sloped if the demand for that country's exports is negatively sloped.

Problems

2. The answers to this problem assume that GDP is held constant over each of the next 10 years. GDP is assumed to be constant over the next 10 years in order to concentrate on the relationship between the size of the deficit, the accumulation of debt, the return that foreigners demand, and the percentage of output that would have to be paid under the alternative paths of the deficit and returns paid on the debt.

(a) If the current account deficit remains at five percent of GDP for each of the next 10 years, then the additional accumulated debt over that time will equal 50 percent of GDP. If the current account declines steadily to 2.5 percent at the end of the 10 year period, then it will average 3.75 percent for each of the 10 years, or amount to a total of 37.5 percent of GDP of additional accumulated debt over that period. Finally, if the current account declines steadily so that it is in balance at the end of the 10 year period, then it will average 2.5 percent for each of the 10 years, or amount to a total of 25 percent of GDP of additional accumulated debt over that period.

(b) Under the first path of additional accumulated debt, we will have to pay 1 percent (0.02 times 0.5 = 0.01) of our output annually if foreigners demand a 2 percent rate of return. We will have to pay foreigners 2.5 percent of our output annually if they demand a 5 percent rate of return, and we will have to pay them 5 percent of our output annually if they demand a 10 percent rate of return. Under the second path, we will have to pay them 0.75, 1.875, and 3.75 percent of our output annually if they demand 2, 5, and 10 percent rates of return, respectively. Finally, we will have to pay them .5, 1.25, and 2.5 percent of our output annually if they demand 2, 5, and 10 percent rates of return, respectively, under the third path.

6. (a) (1) $NX = 500 - 0.0375\,Y$.
   (2) $A_p = 2800 - 40\,r$.
   (3) marginal leakage rate = 0.4.
   (4) *IS*: $Y = 7000 - 100\,r$.
   (5) *LM*: $Y = 5000 + 100\,r$.
   (5) $r = 10$
   (6) $Y = 6000$.

   (b) (1) $A_p = 2880 - 40\,r$.
   (2) *IS*: $Y = 7200 - 100\,r$.
   (3) $r = 11$.
   (4) $Y = 6100$.

   (c) $\Delta A'_p = 80 \Rightarrow \Delta NX_a = -80 \Rightarrow \Delta e = 0.4 \Rightarrow e = 2.4$.

   (d) The increase in the interest rate from 10 to 11 caused a capital inflow that raised the foreign exchange rate from 2 to 2.4. This shifted the *IS* curve back to its original position, thereby reducing the interest rate back to the world rate of 10.

   (e) The increased government expenditure, $\Delta G = 1080 - 1000 = 80$, crowded out net exports of an equal amount. At $Y = 6100$ and $e = 2.4$, $NX = 900 - 0.0375(6100) - 200(2.4) = 191.25$. At $Y = 6100$ and $e = 2$, $NX = 900 - 0.0375(6100) - 200(2) = 271.25$. The amount of net exports crowded out is 80, as $\Delta NX = 191.25 - 271.25 = -80$.

   (f) $Y = 6100$ and $r = 9$.

   (g) At $e = 1.6$, a decline of 0.4, *NX* will increase by 80, and the new equation for the *IS* curve will be $Y = 7200 - 100\,r$. The interest rate increases to 10, and Y becomes 6200.

   (h) The decline in the interest rate from 10 to 9 caused a capital outflow that lowered the foreign exchange rate from 2 to 1.6. This shifted the *IS* curve back rightward, thereby increasing the interest rate back to the world rate of 10.

7. (a) 1. Given the foreign exchange rate equals 2, net exports equal $870 - 0.08Y - 200(2) = 470 - 0.08Y$.

   2. In this problem, $s = 0.15$, $t = 0.2$, and $nx = 0.08$, so that the marginal leakage rate equals $0.15(1 - 0.2) + 0.2 + 0.08 = 0.12 + 0.2 + 0.08 = 0.4$. Therefore, the multiplier, k, equals $1/0.4 = 2.5$.

   3. $A_p = C_a - cT_a + I_p + G + NX_a = 200 - 8r - 0.85(200) + 1{,}700 - 32r + 1{,}800 + 470 = 4{,}000 - 40r$.

   4. The equation of the *IS* curve is $Y = kA_p$. Therefore the equation of the *IS* curve is $Y = 2.5(4{,}000 - 40r) = 10{,}000 - 100r$.

   5. To obtain the equation for the *LM* curve use either equation (6) on page 127 or set the real demand for money equal to the real supply of money to get $0.25Y - 25r = 2{,}250$. Adding $25r$ to both sides yields $0.25Y = 2{,}250 + 25r$. Dividing both sides by 0.25 provides us with the *LM* equation $Y = 9{,}000 + 100r$.

   6. To compute the equilibrium domestic and foreign interest rates, set the equation for the *IS* curve equal to the equation for the *LM* curve to get $10{,}000 - 100r = 9{,}000 + 100r$. Adding $100r$ to and subtracting 9,000 from both sides yields $200r = 1{,}000$. Dividing both sides by 200 yields the equilibrium domestic and foreign interest rates $r = r^f = 5$.

   7. To compute equilibrium real output, substitute the equilibrium domestic interest rate into the equations for the *IS* and *LM* curves to get $Y = 10{,}000 - 100(5) = 9{,}000 + 100(5) = 9{,}500$.

(b) 1. To obtain the equation for the new *LM* curve, again use either equation (6) on page 127 or set the real demand for money equal to the new real supply of money to get $0.25Y - 25r = 2{,}200$. Adding $25r$ to both sides yields $0.25Y = 2{,}200 + 25r$. Dividing both sides by 0.25 provides us with the *LM* equation $Y = 8{,}800 + 100r$.

2. To compute the new equilibrium domestic interest rate, set the equation for the *IS* curve equal to the equation for the new *LM* curve to get $10{,}000 - 100r = 8{,}800 + 100r$. Adding $100r$ to and subtracting 8,800 from both sides yields $200r = 1{,}200$. Dividing both sides by 200 yields the new equilibrium domestic interest rate $r = 6$.

3. To compute the new (temporary) equilibrium real output, substitute the new equilibrium domestic interest rate into the equations for the *IS* and *LM* curves to get $Y = 10{,}000 - 100(6) = 8{,}800 + 100(6) = 9{,}400$.

4. In a small open economy, the domestic and foreign exchange rates must be equal. That requires that the domestic interest rate decline to 5 percent. At a 5 percent interest rate, real output equals $8{,}800 + 100(5) = 9{,}300$, given the 50 billion decline in the real money supply.

5. For the commodity market to be in equilibrium at an interest rate of 5 percent and real output equal to 9,300, there must be a 200 billion dollar shift left of the *IS* curve so that the equation for the new *IS* curve is $Y = 9{,}800 - 100r$. Given a multiplier of 2.5, the *IS* curve shifts left by 200 billion dollars if there is an 80 billion dollar decrease in autonomous spending, and therefore net exports. For net exports to decline by 80 billion, the foreign exchange rate must rise to 2.4 from 2. (Check: if $e = 2.4$, $NX = 870 - 0.08Y - 200(2.4) = 390 - 0.08Y$, $A_p = 200 - 8r - 0.85(200) + 1{,}700 - 32r + 1{,}800 + 390 = 3{,}920 - 40r$, so that the equation of the new *IS* curve is $Y = 2.5(3{,}920 - 40r) = 9{,}800 - 100r$.)

(c) 1. The equation of the new autonomous planned spending is $A_p = 200 - 8r - 0.85(200) + 1{,}700 - 32r + 1{,}720 + 470 = 3{,}920 - 40r$.

2. The equation of the new *IS* curve is $Y = 2.5(3920 - 40r) = 9{,}800 - 100r$.

3. To compute the new equilibrium domestic interest rate, set the equation for the new *IS* curve equal to the equation for the *LM* curve to get $9{,}800 - 100r = 9{,}000 + 100r$. Adding $100r$ to and subtracting 9,000 from both sides yields $200r = 800$. Dividing both sides by 200 yields the new equilibrium domestic interest rate $r = 4$.

4. To compute the new (temporary) equilibrium real output, substitute the new equilibrium domestic interest rate into the equations for the *IS* and *LM* curves to get $Y = 9{,}800 - 100(4) = 9{,}000 + 100(4) = 9{,}400$.

5. In a small open economy, the domestic and foreign exchange rates must be equal. That requires that the domestic interest rate increase to 5 percent. At a 5 percent interest rate, real output equals $9{,}000 + 100(5) = 9{,}500$, given no change in the real money supply.

6. For the commodity market to be in equilibrium at an interest rate of 5 percent and real output equal to 9,500, the *IS* curve must shift right back to its original location. That requires that autonomous spending, and therefore net exports, must rise by 80 billion, the amount of the decrease in government spending. For net exports to increase by 80 billion, the foreign exchange rate must fall from 2 to 1.6. (Check: if $e = 1.6$, $NX = 870 - 0.08Y - 200(1.6) = 550 - 0.08Y$, $A_p = 200 - 8r - 0.85(200) + 1{,}700 - 32r + 1{,}720 + 550 = 4{,}000 - 40r$, so that the equation of the *IS* curve is $Y = 2.5(4{,}000 - 40r) = 10{,}000 - 100r$.)

(d) Parts (b) and (c) sow that monetary policy is very potent in a small open economy with a flexible exchange rate system, whereas fiscal policy can have only a temporary impact on real output in such an economy.