

Answers to Questions: Chapter 4

1. When the economy is “off” the *IS* curve, planned expenditure will not equal output. If the economy is to the “left” of the *IS* curve, $E_p > Y$, and there is a negative unplanned inventory change. Firms will increase output until $E_p = Y$. As firms seek funds with which to increase inventory investment, they will bid up the interest rate. Thus, the movement will tend to be upward and to the right. If the economy is to the “right” of the *IS* curve, there is a positive unplanned inventory change and either output, the interest rate, or both will decline.
2. When the economy is “off” the *LM* curve, the demand for real money balances will not equal the supply of real balances in the economy. If the economy is to the left of the *LM* curve, the amount of money demanded, given the interest rate and income level, is less than the money supplied. Then, individuals will attempt to “get rid of” the excess money; this activity will cause bond prices to rise and interest rates to fall. This process will continue until interest rates fall enough to cause equality between the demand for real balances and the money supply. It is also possible that individuals will “get rid of” their excess money balances by spending them on goods and services. Then, the movement will be downward and to the right. The opposite movements will occur if the economy is to the right of the *LM* curve.
3. The crowding-out effect comes through rising interest rates. Thus, autonomous expenditure sensitive to the interest rate would decrease. Induced expenditure responds to changes in real output.
4. Some government expenditure, such as local bonding for school building construction and other state and local expenditure for capital improvements, is sensitive to changes in the interest rate and could be “crowded out” if the interest rate increases. The government debt seemed to encourage fiscal responsibility in Congress during the 1980s and 1990s. In early 2011, Congress and President Obama debated how to reduce the budget deficit over concerns about the size of the federal debt. These occasions indicate when it is possible that the “normal” increase in government expenditure may be reduced in response to the interest burden on the federal budget. Whether one thinks this is a likely scenario, of course, depends on one’s view of the government budgetary process.
5. Along a given *LM* curve the money supply is unchanged. Thus, the velocity of money rises as income rises and falls as income falls. Velocity behaves this way because of the effects of the interest rate and income on the demand for money. A higher interest rate reduces the demand for real money balances and requires higher income to keep the

demand for money equal to the fixed money supply. At a lower interest rate, a smaller income maintains equilibrium in the money market.

6. a. This situation is a point to the left of the *IS* and *LM* curves. Planned spending exceeds income at any point to the left of the *IS* curve. There is an excess supply of money at any point to the left of the *LM* curve. When planned spending exceeds income, firms have negative inventory investment, so they step up production and income rises. When there is an excess supply of money, people attempt to turn money into stock, bonds, and other income generating assets. These actions drive up the prices of those assets and drive down the interest rate.
 - b. This situation is a point to the right of the *IS* curve and to the left of the *LM* curve. Unintended inventory investment is positive at any point to the right of the *IS* curve. The real demand for money is less than the supply of money at any point to the left of the *LM* curve. When unintended inventory investment is positive, firms cut output and income falls. When the demand for money is less than the supply of money, people attempt to turn money into stock, bonds, and other income generating assets. These actions drive up the prices of those assets and drive down the interest rate.
 - c. This situation is a point to the left of the *IS* curve and to the right of the *LM* curve. Unintended inventory investment is negative at any point to the left of the *IS* curve. This causes firms to step up production and income rises. There is an excess demand for money at any point to the right of the *LM* curve. People attempt to turn stock, bonds, and other income generating assets into money. These actions drive down the prices of those assets and drive up the interest rate.
 - d. This situation is a point to the right of the *IS* and the *LM* curves. Planned spending is less than income at any point to the right of the *IS* curve and firms have positive quantities of unwanted inventories. Therefore, they cut production and income falls. The real demand for money exceeds the supply of money at any point to the right of the *LM* curve. People attempt to turn stock, bonds, and other income generating assets into money. These actions drive down the prices of those assets and drive up the interest rate.
7. The Fed's low federal funds rate from 2002 to 2004 fueled the development of the housing bubble as: (a) households found it easy to finance the purchase of houses and condos not only as residences but in addition, as speculative investments; (b) made it easy for lenders to borrow short-term at low interest rates and issue long-term mortgages at higher interest rates; (c) spawned the development of the sub-prime mortgage market where too often little attention was paid to the ability of borrowers to repay loans; and (d) caused many homeowners to refinance their homes, often with increases in the amount borrowed.

When the Fed raised interest rates between 2004 and 2006, lenders found mortgage loans less profitable and raised interest rates above what subprime borrowers could afford. As a result, the climb in housing prices first slowed, and then was reversed. As housing prices fell, many homeowners could no longer afford their mortgages, leading to defaults on loans. Those defaults resulted in banks taking ownership of homes that they then attempted to sell. The attempt by banks to sell the foreclosed homes added to the supply of houses on the market, which only contributed to the slide of house prices.

8.
 - a. Shift (for a given Y , $(M^s/P) = (M/P)^d$ at a lower r).
 - b. Rotate (the horizontal intercept is unchanged).
 - c. Shift and rotate (both horizontal intercept and slope change).
 - d. No effect on position or slope of LM curve.
 - e. Causes movement along LM curve, but does not affect its position or slope.
 - f. Since the prices of goods and services and nominal amounts in checking accounts were adjusted in proportion to the amount a unit of each currency could be converted into the Euro, there would be no change in either the real demand for money or the real money supply. Therefore, there would be neither a shift or nor a rotation of the LM curve.
 - g. The switch from using checks to using debit cards to buy goods and services has no effect on the real demand for money. The switch from checks to debit cards merely affects how people access the funds they have in checking accounts when they buy goods and services. Therefore, there would be neither a shift or nor a rotation of the LM curve.
 - h. The switch from using checks to credit cards to buy goods and services has two effects on the real demand for money. First, the switch reduces the real demand for money at each combination of real income and the interest rate. That causes the LM curve to shift to the right since it will take a higher level of real income to equate the real demand for and real supply of money, given the interest rate. Second, the switch reduces how much the real demand for money increases as real income rises, given the interest rate. That causes the LM curve to rotate and become flatter because if the demand for money increases by a smaller amount when real income rises, it takes a smaller increase in the interest rate to restore equilibrium in the money market.
9. If government spending becomes negatively sensitive to changes in the interest rate, then autonomous spending declines by a larger amount for any given change in the interest rate. Therefore, the IS curve becomes flatter and, other things being equal, any given fiscal expansion results in smaller increases in output and the interest rate. However, because the fiscal expansion causes a smaller increase the interest rate, it also means that

less autonomous consumption and planned investment is crowded out by the fiscal expansion.

Likewise, if autonomous taxes become positively sensitive to changes in the interest rate, then disposable income declines when the interest rate rises. That means that autonomous spending becomes more sensitive to the interest rate. Therefore, the *IS* curve becomes flatter and, other things being equal, any given fiscal expansion results in smaller increases in output and the interest rate. However, because the fiscal expansion causes a smaller increase the interest rate, it also means that less autonomous consumption and planned investment is crowded out by the fiscal expansion.

10. If private sector spending is highly sensitive to a change in the interest rate, then the *IS* curve is relatively flat. The main effect of a fiscal expansion will be a higher interest rate that reduces private sector spending almost as much as the fiscal expansion increases autonomous spending. As a result, the fiscal expansion causes very little increase in output. In the case of a fiscal contraction, the effect of the lower interest rate on private sector spending almost offsets the effect of the fiscal contraction. As a result, fiscal policy is unable to have much of an impact on output.

On the other hand, monetary policy is quite capable of changing output if private sector spending is highly sensitive to a change in the interest rate. A policy of tight money will result in a sharp contraction of private sector spending as the interest rate rises. Easy money will provide a large stimulus to private sector spending as the interest rate falls.

11. If the demand for money is highly insensitive to a change in the interest rate, then as fiscal policy changes income and therefore the demand for money, it will take a large change in the interest rate to restore equilibrium in the money market. This results in a change in private sector spending that offsets most of the expansion or contraction of output caused by fiscal policy.

On the other hand, monetary policy is very powerful when the demand for money is highly insensitive to a change in the interest rate. Any excess supply or demand for money that is created by a change in monetary policy must be absorbed by the way in which income affects the demand for money. This leads to a relatively large change in the interest rate and results in relatively large increases in autonomous spending and real output.

12. An increase in autonomous taxes shifts the *IS* curve to the left. To maintain equilibrium in the commodity and money markets, both equilibrium income and the interest rate fall. Consumption falls as a decline in induced consumption dominates any boost the lower interest rate gives autonomous consumption. Planned investment rises because of the lower interest rate.

13. Smaller demand shocks mean that the shifts left and right of the *IS* curve become smaller, and for a given *LM* curve, there is less variation in both real income and the interest rate. Therefore, if the “Great Moderation” was due to smaller demand shocks, then the decline in the variation of real GDP was accompanied by a decrease in the variation of the interest rate as well.

On the other hand, if the “Great Moderation” was due to a better response by monetary policymakers to the same demand shocks as previously, then that means that they were responding more rapidly by (a) reducing the real money supply when a shock adds to demand and (b) increasing the real money supply when a shock reduces demand. In terms of the *IS-LM* model, the *LM* curve shifts left when the *IS* curve shifts right and the *LM* curve shifts right when the *IS* curve shifts left. Therefore, if the “Great Moderation” was due to a better response by monetary policymakers to the same demand shocks as previously, then the decline in the variation of real GDP was accompanied by an increase in the variation of the interest rate.

14. If the Fed is not worried about inflation but is concerned that unemployment is too high, it is likely to take actions to ensure that the tax cut has its maximum impact on output. The Fed is likely to increase the money supply to prevent any rise in the interest rate that would otherwise result from the tax cut. The Fed’s actions are likely to resemble those shown in the top right frame of Figure 4-10.
15. If only the Fed is able to take action, then it will have to reduce the money supply and raise interest rates in order to reduce actual real GDP relative to natural real GDP. If, however, monetary and fiscal policymakers are able to agree on a “tight money, tight fiscal policy” mix, then it is possible to reduce real GDP relative to natural real GDP without any increase in the interest rate. The “tight money, tight fiscal policy” mix would have less of an impact on interest-rate sensitive private sector spending than a monetary policy that relied solely on higher interest rates to reduce inflationary pressures.
16. The effect of the personal tax cut is to increase consumption expenditures, which results in an increase in autonomous planned spending and therefore equilibrium income at each interest rate. The effect of the tax cut is shown graphically as a shift right of the *IS* curve. Since the Fed wants to maintain real GDP at its current level, it needs to reduce the real money supply. The reduction in the money supply raises the interest rate. The higher interest rate reduces planned investment expenditures. Therefore, since real GDP is left unchanged as a result of the combination of expansionary fiscal policy and tight money, a larger percentage of real GDP is made up of consumption expenditures and a smaller percentage of output is made up of planned investment expenditures. The reduction is

planned investment expenditures will leave future generations with less capital resources, which would reduce future economic growth.

17. The argument is incorrect. High levels of consumer and business confidence shift both the A_p demand schedule and the IS curve to the right. As a result, equilibrium occurs in the commodity and money markets at a higher level of income and a higher interest rate. However, it does not follow from this that raising the interest rate during a recession would increase either consumer and business confidence or income. *Ceteris paribus*, a monetary policy that raised the interest rate would shift the LM curve to the left and reduce income.
18. When the interest rate reaches the lower zero bound, any additional increase in the real money supply by the Fed can have no impact on the interest rate. Therefore when the zero lower bound for the interest rate is reached, monetary policy cannot be used on its own to increase real GDP. However, when the zero lower bound is reached, a combination of expansionary fiscal policy and easy money policy can be used to increase output without any increase in the interest rate. Specifically, the Fed can buy up the debt issued by the government to finance the expansionary fiscal policy.

The arguments presented against this mix of fiscal and monetary policy are that it will impose a burden on future generations because of the interest payments that result from an increase in the national debt and that it will be inflationary. However, if the Fed buys the securities issued by the government to finance the expansionary fiscal policy, then there will be no additional interest to be paid by future generations. As for inflation worries, the expansionary policies adopted by the Bush administration failed to increase “core inflation” (inflation less the effect of food and energy prices) between 2001 and 2007, and with unemployment as high as it was in 2010-11, the mix would not likely add to inflation if it were to be used to expand output.