

## Answers to Questions: Chapter 3

1. Movements in endogenous variables are explained by the theory; movements in exogenous variables are not. Here and throughout the book, Gordon makes no distinction between exogenous variables and parameters. Both are determined outside the model and fixed for each period of analysis. Both, however, may be variables for purposes of problems and exercises. Thus, although the marginal propensity to consume is treated as a fixed parameter throughout the chapter, the end-of-chapter problems contain examples where MPC takes a different value.

<b>Endogenous</b>	<b>Exogenous</b>
Consumption	Autonomous taxes
Net exports	Marginal propensity to consume
GDP	Exports
Tax revenue	Price level
Disposable income	Interest rate
Saving	Investment
Foreign trade surplus (deficit)	
Government budget surplus (deficit)	

2. We distinguish between the two types of consumption for two reasons. First, each type of spending is determined by a different cause: induced consumption is determined by the level of disposable income and the marginal propensity to consume, while autonomous consumption is determined by factors other than income. Second, changes in autonomous consumption cause a multiplier effect in the economy, but changes in induced consumption do not.
3. The Understanding the Global Economic Crisis box on pages 62–63 shows how the booms in housing prices from 2000 through April 2006 and stock prices from 2003 through 2007 resulted in increases in total assets, net worth, and the household net worth relative to personal disposable income up to 2007. Those increases in wealth caused consumption expenditures to rise relative to personal disposable income as indicated by the decline in the personal saving rate over those same years.

The drop in housing prices after April 2006 and declining stock prices in 2008 caused falls in real wealth and consumption expenditures, as shown by a sharp rebound in the personal saving rate after 2006.

4. Businesses reduce production during a recession primarily because of falling demand for their goods and services. One of the first indications businesses get that demand has fallen is that they have more unsold goods in inventories than they would like. That is, businesses see an unintended rise in inventories, which causes them to reduce output. On the other hand, once businesses become confident that the economy is on the rebound, then they will start to build up inventories in anticipation of higher sales.
5. Positive unintended inventory investment results if income is greater than planned expenditure and businesses' inventories build up. To avoid the costs of financing and storing unwanted inventories, businesses cut production, which causes income to fall. Negative unintended inventory investment occurs if income is less than planned expenditure and businesses' inventories shrink. To meet current sales and replenish inventories, businesses raise production, causing income to rise.
6. The impact of a change in investment will be greater the larger the marginal propensity to consume. Although the initial impact of the change in autonomous investment is the same in any case, the larger the MPC, the greater will be the secondary effects on consumer spending.
7. Expansionary fiscal policy would include increasing government spending or decreasing taxes. In each case, the size of the deficit would increase. If the budget were initially in surplus, however, the same policy choice would decrease the surplus.
8. The *IS* curve is downward sloping because a fall in the interest rate results in a rise in consumption and planned investment, the two interest rate sensitive components of autonomous planned spending. That increase in planned spending results in a rise in income as businesses increase output in response to the greater demand for goods and services. Income continues to rise until the commodity market is once again in equilibrium. Note that the higher level of income takes place at a lower interest rate, which is shown graphically as a movement down the *IS* curve. A shift of the *IS* curve takes place when autonomous planned spending changes due to something other than a change in the interest rate. For example, suppose that there is a change in fiscal policy which reduces autonomous planned spending. That decrease causes a fall in income as business firms cut output in response to the lower demand for goods and services. Income continues to fall until the commodity market is once again in equilibrium. Note that the lower level of income takes place at the same interest rate, which is shown graphically as a shift left of the *IS* curve.
9. The rise in the investment–GDP ratio in the four quarters leading up to the recession of 1981–82 would be reflected in a rise in autonomous planned spending which would shift the *IS* curve to the right. However, starting in mid-1981, the *IS* curve shifts left as the investment–GDP ratio decrease would be reflected in a fall in autonomous planned

spending. Note that the investment–GDP ratio starts to decline even before the onset of the 2007–09 recession due to a collapse in housing construction following the bursting of the house price bubble. Furthermore, the larger and longer decline in the investment–GDP ratio in the 2007–09 recession when compared to the 1981–82 recession means that the *IS* curve shifts left more and for a longer period of time during the 2007–09 recession when compared to the earlier downturn. Finally, the investment–GDP ratio returns to its pre-recession level within 10 quarters of the onset of the 1981–82 recession, something that does happen in the same period following the end of the recent recession. This means there is less of a shift right of the *IS* curve in 2010 in comparison to the shift right of the *IS* curve in 1983–84.

10. a. The decline in sales of American agricultural exports reduces net exports. Therefore, autonomous planned spending decreases at a given interest rate. The reduction results in a fall in equilibrium income at a given interest rate, which is shown graphically as a shift left of the *IS* curve.
  - b. The collapse in consumer confidence reduces consumption. Therefore, autonomous planned spending decreases at a given interest rate. The reduction results in a fall in equilibrium income at a given interest rate, which is shown graphically as a shift left of the *IS* curve.
  - c. The collapse in business confidence reduces planned investment. Therefore, autonomous planned spending decreases at a given interest rate. The reduction results in a fall in equilibrium income at a given interest rate, which is shown graphically as a shift left of the *IS* curve.
  - d. The reluctance of some banks to make car and housing loans following the financial crisis of 2007–08 reduces the amount of consumption and planned investment expenditures at each interest rate. Therefore, autonomous planned spending decreases at a given interest rate. The reduction results in a fall in equilibrium income at a given interest rate, which is shown graphically as a shift left of the *IS* curve.
11. Since a demand shock is a significant change in desired spending by consumers, business firms, the government, or foreigners, a demand shock causes a change in autonomous planned spending at a given interest rate. That change in autonomous planned spending results in a change in equilibrium income, given the interest rate, and is shown graphically as a shift in the *IS* curve. Thus the hypothesis that the increased stability of the U.S. economy since 1985 is due to smaller and less important demand shocks can be interpreted to mean that shifts of the *IS* curve have become smaller.

$$12. C = a + c(Y - T) = a + cY - c(T_a + tY) = a - cT_a + c(1 - t)Y.$$

$$S = -a + s(Y - T) = -a + sY - s(T_a + tY) = -a - sT_a + s(1 - t)Y.$$

13. The greater the MPC, the smaller is the marginal leakage rate. Therefore, the impact of a change in investment will be greater the smaller the marginal leakage rate. It will take more rounds of spending and saving to generate the necessary increase in leakages to match the initial change in autonomous spending.
14. The marginal leakage rate in this case is  $s + nx$ , so the balanced budget multiplier is  $s/(s + nx)$ , which is less than one.