

**Solutions to Homework Assignment #4**

Required Assignment #4

*Textbook Questions*

\* denotes graded questions

Chapter 13 (p. 334): Problems 6\*, 8\*

- 6\*. a. The consumption function is  $C = 1 + 0.9(Y - T)$  where the “1” is 1 billion.

The consumption function is the relationship between consumption expenditure and disposable income, other things remaining the same. The constant in the consumption function is autonomous consumption, \$1 billion. The slope parameter of the consumption function is the *MPC*, 0.9 in the case at hand.

- b. The equation of the *AE* curve is  $AE = 6.4 + 0.9Y$ , where *Y* is real GDP. Aggregate planned expenditure is the sum of consumption expenditure, investment, government purchases, and net exports. Net exports are zero. Then, using the symbol *AE* for aggregate planned expenditure, aggregate planned expenditure is:

$$AE = 1 + 0.9(Y - 4) + 5 + 4$$

$$AE = 1 + 0.9Y - 3.6 + 5 + 4$$

$$AE = 6.4 + 0.9Y$$

- c. Equilibrium expenditure is \$64 billion.  
Equilibrium expenditure is the level of aggregate expenditure that occurs when aggregate planned expenditure equals real GDP. That is,  $AE = 6.4 + 0.9Y$  and  $AE = Y$   
Solving these two equations for *Y* gives equilibrium expenditure of \$64 billion.
- d. Equilibrium real expenditure decreases by \$20 billion (to \$44 billion), and the multiplier is 10.  
The multiplier equals  $1/(1 - \text{slope of the } AE \text{ curve})$ . The equation of the *AE* curve tells us that the slope of the *AE* curve is 0.9. So the multiplier is  $1/(1 - 0.9)$ , which is 10. Then, the change in equilibrium

expenditure equals the change in investment,  $-2$  billion, multiplied by 10.

- 8\*. a. The quantity demanded increases by \$10 billion.  
The increase in investment shifts the aggregate demand curve rightward by the change in investment times the multiplier. The multiplier is 10 and the change in investment is \$1 billion. Thus the aggregate demand curve shifts rightward by \$10 billion.
- b. In the long-run, real GDP equals potential GDP, so in the long run real GDP does not increase.  
In the long run, the *SAS* curve shifts so that real GDP is determined by the intersection of the *AD* curve and the *LAS* curve. After the initial increase in investment, money wages increase and, as a result, the *SAS* curve shifts leftward. Eventually in the long run, real GDP moves back to equal potential GDP.
- c. In the short run, the price level rises.

Chapter 14 (p.359): Problem 2

2. a. Possible combinations are *B* or *C*, *F* or *H*, and *J* or *L*.  
A Keynesian expansion results from an increase in investment caused by an increase in expected profit and sales (animal spirits). In an extreme case, no prices change, so the move is to *B*, *F*, and *J*. But a more general possibility is that the money wage rate doesn't change (because of sticky money wages) but the price level rises, real wage rate falls, and the interest rate rises. In this case, the move is to *C*, *H*, and *J*.
- b. *C*, *H*, and *K*.  
A monetarist expansion results from an increase in the quantity of money. The interest rate falls, and, as a result, investment increases. Aggregate demand increases, but the money wage rate doesn't change. Real GDP and the price level increase, the real wage rate falls, and employment increases. The move is to *C*, *H*, and *K*.
- c. *C*, *H*, and *I*, *K*, or *L*.
- d. *C*, *H*, and *I*, *K*, or *L*.

Either type of rational expectations expansion results from an unanticipated increase in aggregate demand. Any of several factors could initiate the increase in aggregate demand, and the interest rate could rise, fall, or remain constant (and thus move to point *I*, *K*, or *L*). Aggregate demand increases, but the money wage rate either doesn't change or doesn't change by enough to maintain full employment. So real GDP and the price level increase, the real wage rate falls, and employment increases.

- e. *D*, and *E*, *G*, or *H*, and *L*.

In a real business cycle expansion, an increase in productivity increases the demand for labor and capital. The interest rate and the real wage rate rise and investment and employment increase.

Aggregate demand and aggregate supply increase, so real GDP increases but the price level might fall, rise, or remain unchanged.

Chapter 15 (p.385-386): Problems 2\*, 6\*, 10

- 2\*. a. The supply of labor will increase. The supply of labor curve will shift rightward. The supply of labor increases because at each real wage rate, the after-tax wage rate received by workers will be higher given a decrease in the tax rate on labor income.
- b. The demand for labor will remain the same. The demand for labor depends on the productivity of labor, which remains the same following the decrease in the tax rate on labor income.
- c. The equilibrium level of employment will increase. With the rightward shift in the supply of labor curve, the real wage rate decreases and the quantity of labor demanded increases along the demand for labor curve. Equilibrium employment increases.
- d. The equilibrium pre-tax wage rate will decrease. The rightward shift of the supply of labor curve leads to movement down along the demand for labor curve.
- e. The equilibrium after-tax wage rate will increase. The decrease in the tax rate on labor income decreases the wedge between the pre-tax wage rate and the after-tax wage rate. The pre-tax wage rate decreases but not by as much as the decrease in tax. So the after-tax wage rate will increase.

- f. Potential GDP will increase. The equilibrium level of employment is the full employment. So as full employment increases, potential GDP increases along the production function.
  - g. If the cut in the labor income tax rate were offset by an increase in the sales tax, it would be equivalent to no change in the real wage rate received by workers. So the supply of labor would not change. With no change in the supply of labor or the demand for labor, equilibrium employment would remain the same and equilibrium before-tax and after-tax wages would remain the same. Potential GDP would remain unchanged.
  - h. The cross-country evidence for the United States, the United Kingdom, and France on marginal income tax rates and employment suggests that higher tax on labor income has a significant effect on the labor market.
- 6\*. a. The decrease in government expenditures by \$100 billion increases saving supply, which decreases the real interest rate and stimulates investment.
- b. The stronger the Ricardo-Barro effect, the less the increase in saving supply as taxpayers expect future taxes to be lower due to the decline in government expenditures.
10. a. Fiscal policy that decreases spending or increases taxes would decrease aggregate demand. In terms of automatic fiscal policy, need-tested spending decreases in expansions and induced taxes increase. Congress may also use discretionary policy by cutting spending programs or increasing tax rates.
- b. A decrease in government purchases with an offsetting decrease in taxes would not bring a change in government saving and so would not change investment and the growth of real GDP. However, the increase in taxes would lead to a decrease in the level of potential GDP.
- c. The risk of discretionary policy is that, because of time lags, it takes effect too late and ends up moving the economy away from potential GDP.

Chapter 16 (p.408): Problems 6\*, 8

- 6\*. a. The policy action was part of a feedback rule. The action was taken because of the Fed's concern that slow growth in other world economies would spread to the United States, so the Fed wanted to speed U.S. economic growth.
- b. The cut in interest rates increased aggregate demand. It raised real GDP and raised the price level (compared with what would have happened).
- c. A possible criticism, and one that some economists have made, is that to cut interest rates, the Fed increased the growth rate of the quantity of money. By increasing the growth rate of the quantity of money, the Fed risked re-igniting inflation. Indeed, in 1999 the Fed became concerned about the possibility that inflation would recur and increase, so the Fed raised interest rates in 1999. Then, in 2001, the Fed became worried about recession again and cut interest rates repeatedly and sharply.
8. a. A nation's saving rate is the sum of its government saving rate plus its private saving rate. The nation's saving rate might fall because the government saving rate falls and/or the private saving rate falls. The government saving rate falls when the government budget surplus gets smaller or the budget deficit gets larger. The private saving rate falls when people decrease their saving and boost consumption expenditure.
- b. Monetary policy is limited in its ability to affect saving in the long run. The main thing monetary policy can do is pursue price level stability, which reduces the risks associated with unanticipated inflation for savers.