

# SGPE Summer School

## Macro Problem Set 6

*Aggregate Demand I*  
*Mankiw, Chapter 10*

6<sup>th</sup> August 2013

### Problems

#### Question 1

Assume the following model of the economy:

$$C = 180 + 0.8(Y - T)$$

$$I = 190$$

$$G = 250$$

$$T = 150$$

- (a) Compute the initial equilibrium level of income.
- (b) If government purchases were to increase by 10 to 260, by how much would the following variables change?
  - (i) the planned expenditure curve
  - (ii) the equilibrium level of income
  - (iii) the level of consumption
  - (iv) the government budget deficit.
- (c) Starting over again at  $G = 250$ , suppose that taxes increased by 10 to 160. What would happen to each of the following? State the amount and direction of change:
  - (i) the planned expenditure curve
  - (ii) the equilibrium level of income
  - (iii) the level of consumption
  - (iv) the government budget deficit.

- (d) Once again at  $G = 250$  and  $T = 150$ , suppose now that government expenditure and taxes were *both* increased by 10. Draw the consumption, government purchases and planned expenditure graphs to indicate the amount as well as direction of the changes:
- (i) the planned expenditure curve
  - (ii) the equilibrium level of income
  - (iii) the level of consumption
  - (iv) the government budget deficit.

### Question 2

In 2003, Congress enacted substantial increases in defense spending to counter terrorism and significant reductions in taxes.

- (a) What were the short-run effects on the planned expenditure curve and the equilibrium level of GDP?
- (b) What were the effects on the  $IS$  and/or  $LM$  curves? Be as precise as you can about the exact shifts.

### Question 3

Although our development of the Keynesian cross in today's lecture assumes that taxes are a fixed amount, in many countries (including the United States) taxes depend on income. Let's represent the tax system by writing tax revenue as

$$T = \bar{T} + tY,$$

where  $\bar{T}$  and  $t$  are parameters of the tax code. The parameter  $t$  is the marginal tax rate: if income rises by \$1, taxes rise by  $t \times \$1$ .

- (a) How does this tax system change the way consumption responds to changes in GDP?
- (b) In the Keynesian cross, how does this tax system alter the government-purchases multiplier?
- (c) In the  $IS$  - $LM$  model, how does this tax system alter the slope of the  $IS$  curve? Use the following consumption function  $C = a + b(Y - \bar{T} - tY)$  and investment function  $I = c - dr$ , to derive the  $IS$  curve algebraically.
- (d) If  $a = 10$ ,  $b = 0.8$ ,  $c = 15$ , and  $d = 0.5$ , what is the slope of the  $IS$  curve for a 10 percent tax rate? A twenty percent tax rate?

#### Question 4

Suppose that the money demand function is

$$(M/P)^d = 1,000 - 100r,$$

where  $r$  is the interest rate in percent. The money supply  $M$  is 1,000 and the price level  $P$  is 2.

- (a) Graph the supply and demand for real money balances.
- (b) What is the equilibrium interest rate?
- (c) Assume that the price level is fixed. What happens to the equilibrium interest rate if the supply of money is raised from 1,000 to 1,200?
- (d) If the Fed wishes to raise the interest rate to 7 percent, what money supply should it set?