

## 14.02 Principles of Macroeconomics

### Problem Set #1, Questions

Posted: Wednesday, September 10, 2003

Due Date: Wednesday, September 17, 2003

*Please remember to write your TA's name and section time on the front page of your problem set.*

Assume a closed economy throughout the problem set.

**Part I: True/False Questions: Decide whether each statement is true or false and justify your answer with a short argument.**

1. The Keynesian multiplier is always greater than 1.
2. US nominal GDP in 1998 was 16 times higher than US nominal GDP in 1960. US Real GDP increased by a factor of 3.3 from 1960 to 1998.
3. Assume the government maintains a budget balance through fixed taxes and transfers. If the government increases government transfers and decreases government spending by the same amount, then, the GDP and budget balance will remain unchanged.
4. If the goods market is in equilibrium, then total saving is equal to total investment.

### Part II. National Accounts

In Orangeland, a closed economy, Orangelanders live only on orange juice. There is a farm that produces oranges and a factory that produces OJ. In 2002, the orange farm produced 10 oranges, and sold them to the orange juice company at \$1 each. The orange juice company produced 3 bottles of orange juice, and sold them all at a unit price of \$10 plus 10% indirect tax collected by government (so the price paid was actually \$11). The orange farm paid total wages of \$6. The orange juice company paid total wages of \$10. Both companies retained 50% of their net profits and paid the rest of it as dividends to the households. After receiving their wage income and their dividends, the households paid a 10% direct tax on their total income to the government. The government bought one orange juice bottle (for \$11). The government made no social transfers. (Notice that the firms are not paying any direct taxes on their retained profits)

1. Compute the GDP of Orangeland using (a) income approach, (b) the value added approach, and (c) the final goods approach.
2. What is the total income of the government from taxes?
3. What's the government spending? What's the government budget deficit (or surplus)?

4. What is the disposable income of the households?

The above information holds also for 2003, except that in 2003, the prices of all the goods (oranges and orange juice bottles) go up by 10%.

5. Would you say that the economy experience a real economic expansion between 2002 and 2003? Explain.
6. What was the nominal GDP in 2003?
7. What was the real GDP in 2003 measured at 2002 prices?
8. What is the GDP deflator? What is the inflation rate between 2003 and 2002?

### **Part III: First Macro Model**

Assume a closed economy with:

$$C = 100 + 0.6Y^d, \quad I = 200 - i, \quad G = 500$$

1. **(a)** State the equilibrium condition for GDP and give a brief explanation of what it means. Solve for equilibrium GDP as a function of the unknown variables,  $i$  and  $T$ ; **(b)** Plot two demand curves: (1) in the aggregate demand-Y space; and (2) in the  $i$ -Y space.
2. **(a)** What's the value for the multiplier, autonomous spending, and equilibrium GDP if  $T=0$  and  $i=10$  (so, now  $I=190$ )? **(b)** What's the value for the multiplier, autonomous spending, and equilibrium GDP if the government budget is balanced and  $i=10$ ?
3. **(a)** By how much will the GDP increase if the government decides to increase defense spending by \$500 million? **(b)** By how much will output increase if the government increases defense spending by \$500 million, but keeps a balanced budget? What is the balanced budget multiplier?
4. The government decides to increase total savings in the economy. In order to do that, it implements a new social security law that increases the marginal propensity to save by 0.1. By how much will GDP and total savings change (assume  $G=T=500$ ,  $i=10$ )? Explain.