

1. Unemployment in the United States was 7.5 percent in 1992 and 4.2 percent in 1999.

Assuming that the natural rate of unemployment is 5 percent ($U^* = 0.05$), use Okun's Law to calculate the GDP gap for each of the unemployment rates.

2. Consider the following long-run model:

$$\begin{array}{ll} N = 2400 + 30(W/P) & \text{(Labor Supply)} \\ N = 4400 - 20(W/P) & \text{(Labor Demand)} \\ Y = 150 (N)^{1/2} & \text{(Production Function)} \end{array}$$

- a. What are the levels of employment N , the real wage W/P and output Y ?
- b. Graph the labor supply and labor demand curves, and illustrate the long-run levels of the real wage and employment. Then graph the production function and illustrate the long-run levels of output and employment.
3. Consider an economy described by the following equations:

$$\begin{array}{ll} Y = C + I + G + X & \text{(Income Identity)} \\ C = 200 + .8Y_d & \text{(Consumption)} \\ X = 100 - .14Y & \text{(Net Exports)} \end{array}$$

with investment $I = \$200$ billion, government spending $G = \$300$ billion, and the tax rate $t = .2$.

- a. What is the level of income when spending balance occurs? What is the multiplier?
- b. Suppose government spending increases to \$400 billion. What is the new level of income? Does this change the value of the multiplier?
4. Consider an economy described by the following equations:

$$\begin{array}{ll} Y = C + I + G + X & \text{(Income Identity)} \\ C = 200 + .8Y_d & \text{(Consumption)} \\ I = 200 - 150R & \text{(Investment)} \\ X = 100 - .14Y - 100R & \text{(Net Exports)} \\ M/P = (.8Y - 400R) & \text{(Money demand)} \end{array}$$

with government spending $G = \$300$ billion, the tax rate $t = .2$, the nominal money supply $M = \$1216$ billion, and the predetermined price level $P = 1$.

- a. Derive (algebraically) the IS and LM curves. What are the values of income and the interest rate when spending balance occurs and the demand for money equals the supply of money?
 - b. Using a graph, illustrate your answer to Part (a).
 - c. Suppose that M decreases by \$200 billion, explain and show graphically (not algebraically) what happens in the economy.
5. Suppose government spending in Problem 4 increases to \$400 billion.
 - a. Derive the multiplier for changes in government spending and calculate the new level of income.
 - b. Why is the multiplier smaller than the multiplier in Problem 3? Use a graph to illustrate your answer.