

## 14.02 Principles of Macroeconomics

Spring 2014

Problem Set 3

Due: April 4, 2014

### 1 Labor Market (30 points)

1. Let the price-setting equation be given by  $P = (1 + \mu)W$  and the wage-setting equation be given by  $W = P^e \frac{z}{u}$ , where  $z$  are unemployment benefits and  $u$  is the unemployment rate. Derive the real wage and unemployment consistent with equilibrium in the labor market in the medium run. Is this the natural rate of unemployment? Does this equilibrium rate of unemployment change if unemployment benefits increase? (10 points)

2. Initially, the labor market is in equilibrium at wages  $W_0$  and prices  $P_0$  with unemployment equal to  $u_0$ . Suppose competition suddenly becomes less intense, thereby firms increase their markups. In the short run, suppose  $P^e$  is fixed, what happens to the equilibrium real wage. Compare the equilibrium real wage in the short run and the medium run. (10 points)

3. Suppose that the price-setting equation also takes into account the price of energy (another input in production). In particular,  $P = (1 + \mu)Wq^{1-a}$  where  $q$  is the price of one unit of energy. The wage-setting equation is given by  $W = P^e \frac{z}{u}$ . Derive the real wage and unemployment consistent with equilibrium in the labor market in the medium run. How does the equilibrium unemployment rate change when the price of energy increases? What is the intuition for this result? (10 points)

### 2 AS-AD (40 points)

For this question, specify what happens in the money market, goods market and labor market, when appropriate (use IS-LM diagrams and AS-AD diagrams when necessary).

1. Explain using graphs and words why and how the AD curve shifts when money supply increases. (8 points)

2. Explain using graphs and words why and how the AD curve shifts when there is an increase in the government spending. (8 points)

3. Explain using graphs and words why and how the AD curve shifts if there is an increase in autonomous consumption (recall that this is the share of consumption that does not depend on disposable income. So with our linear

consumption function  $C = c_0 + c_1(Y - T)$  autonomous consumption is  $c_0$ ). (8 points)

4. Explain using graphs and words why and how the AS curve shifts in the short run (when expected price level is fixed) and medium run (when expected price level is equal to the equilibrium price level) if there is an increase in markups. (8 points)

5. Explain using graphs and words why and how the AS curve shifts in the short run and medium run if there is an increase in unemployment benefits. (8 points)

### **3 AS-AD: The paradox of savings revisited (30 points)**

Suppose that the economy begins with output equal to its natural level  $Y_n$ . Now suppose that there is a decrease in consumer confidence which results in households attempting to increase their savings, for a given disposable income.

1. Using the AS-AD and IS-LM diagrams, show the effects of the decline in consumer confidence in the short run and in the medium run. Explain why the curves shift in your diagrams. (10 points)

2. What happens to output, the interest rate, and the price level in the short run? What happens to consumption, investment and private saving in the short run? Is it possible that the decline in consumer confidence will lead to a fall in private savings in the short run? (10 points)

3. Repeat 2 for the medium run. Is there any paradox of savings in the medium run? (10 points)

MIT OpenCourseWare  
<http://ocw.mit.edu>

14.02 Principles of Macroeconomics  
Spring 2014

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.