

Course in Macroeconomics and Global Economics  
University of Rome 'Tor Vergata'  
Academic year 2015/2016

Instructor: Prof. Barbara Annicchiarico  
Teaching Assistants: Francesca Diluiso, Matilde Giaccherini

10/13/2016

## Practice 5

### Exercise 1

1. Write down the price setting equation ( $PS$ ) and the wage setting equation ( $WS$ ), defining all parameters and all variables. Graphically represent the two curves and indicate the natural rate of unemployment.
2. Graphically represent the effects on the natural rate of unemployment implied by the following alternative measures: 1) a reduction in the unemployment subsidy; 2) an increase in the costs of production (exclusively due to labor).
3. Suppose the  $WS$  equation is given by  $W = P(\lambda - u)$ , where  $\lambda$  represents worker's participation rate in the union and assume  $\mu = 0.7$ . Compute the natural rate of unemployment for  $\lambda = 0.7$  and  $\lambda = 0.9$ . What is the relation between the natural rate of unemployment and the participation rate in the union? Comment on your findings.

### Exercise 2

Assume there is an increase in worker's bargaining power and at the same time firm's markup increases. What variables are affected by these changes? Show graphically the effects of this change on the natural rate of unemployment and on real wages. Explain your answer.

### Exercise 3

Suppose that the mark-up of goods prices over marginal costs is 5%, and that the wage setting equation is  $W = P(1 - u)$ , where  $u$  is the unemployment rate.

1. What is the real wage, as determined by the price setting equation?
2. What is the natural rate of unemployment?
3. Suppose that the mark-up increases to 10%. What happens to the natural rate of unemployment? Explain.

#### Exercise 4

Suppose that the production function is  $Y = N$ , the labour force is  $L = 100$ , the mark-up of goods prices over marginal cost is 2% and the wage-setting equation is  $W = P(z - u)$ , where  $u$  is the unemployment rate and  $z = 1$  is catchall variable representing all the factors that may affect wages

1. What is the natural rate of unemployment?
2. If there is an increase in unemployment benefits so that  $z = 1.5$ , what happens to the natural level of output?

#### Exercise 5

Assume a country with the following characteristics: total population is 60 million, population in working age is 35 million, the labour force is 25 million where employed are 19 million and unemployed 6 million. Compute the unemployment and employment rates, the participation and non-participation rates.