

# Introduction to Macroeconomics

## Some questions on the labor market—Tentative answers

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1. Some policies are suggested to reduce  $u_n$ . State which of them might work:
  - (a) Monetary expansion does not affect  $u_n$ ;
  - (b) Fiscal expansion does not affect  $u_n$ ;
  - (c) Reducing the labor force means a lower  $L$ .  $u_n$  solves the wage-price system  $\frac{A}{1+\mu} = F(u, z)$ , with  $u$  defined as  $U/L$ . Thus,  $u_n$  remains unaffected, while  $U$  falls;
  - (d) Cutting unemployment benefits reduces  $z$  and successfully shifts the WS curve down and thus reduces  $u_n$ ;
  - (e) Increasing the mark-up shifts the PS curve down and increases  $u_n$  instead of decreasing it;
2. A labor market follows the relations  $P = W(1 + \mu)$  and  $W = P^e/(1 + 0.5u)$ .  $u_n$  follows from equating  $P = P^e$  and solving  $1/(1 + \mu) = 1/(1 + 0.5u_n)$ .  $u_n$  is twice the mark-up;
3. An economy follows the equation system:

$$\begin{aligned}P &= (1 + \mu) \frac{W}{A}, \\W &= P^e(1 - u + z), \\Y &= AN.\end{aligned}$$

- (a) The aggregate supply relation evolves from substituting the WS curve into the PS curve

$$P = (1 + \mu) \frac{P^e(1 - u + z)}{A}$$

and then using the definition for  $u$

$$u = \frac{U}{L} = 1 - \frac{N}{L} = 1 - \frac{Y}{AL},$$

which finally yields

$$P = (1 + \mu) \frac{P^e(\frac{Y}{AL} + z)}{A}.$$

- (b) The wage-setting and price-setting relations are already given. We may transform them to yield real wage on the left:

$$\frac{W}{P} = \frac{A}{1 + \mu}$$

for the PS and

$$\frac{W}{P} = 1 - u + z$$

for the WS curve, taking the convention into account that the WS curve is already defined by  $P = P^e$ ;

(c) The natural unemployment rate  $u_n$  evolves from equating the WS and PS curves as

$$u_n = 1 + z - \frac{A}{1 + \mu},$$

and the natural output  $Y_n$  from the known relations

$$Y_n = AN_n = AL(1 - u_n) = AL\left(\frac{A}{1 + \mu} - z\right).$$

**Remarks:** Examples like 1c and 3c highlight the meaning of the variables  $L$  and  $A$  in the model. In 1c, the economy is in its ‘medium-run’ equilibrium if the imperfections on the sides of the entrepreneurs (the mark-up) and on the side of the workers (their bargaining power  $L(u, z)$ ) are equal. This equality depends on the unemployment rate not on the number of unemployed persons. In actual economies, migrants may differ regarding their productivity  $A$  from other workers, and immigration and emigration may modify  $u_n$ . Also note that, unlike  $u_n$ , natural output is affected by the decrease in  $L$  and falls.

The working of this equality condition is also obvious from example 2. In 3c,  $A$  apparently has a tremendous and even quadratic effect on natural output. Note, however, that this reaction presumes that workers do not shift their wage-setting curve if their productivity increases. This is unlikely to be true in actual economies. If workers shift their WS curve by the same amount to  $W/P = AF(u, z)$ , the effect disappears.