

Course in Macroeconomics and Global Economics
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Practice 6 - Solutions

Exercise 1

1. Neutrality means that **in the medium run** monetary policy has no effect on output and interest rate. Monetary policy is still useful to bring back faster the economy to its natural level of output during a recession.
2. Fiscal policy cannot change the natural level of output but can change the level of the interest rate and thus investment in the medium run. In this sense it is not neutral.
3. Government policies affecting μ (the mark-up of prices over wages) or z (factors that affect the wage, given unemployment) change the natural level of output/unemployment.

Exercise 2

1. An increase in oil price translates into an increase in production cost for firms. The latter will charge this cost on prices increasing the markup over the marginal cost (μ).
2. The increase in μ shifts the price setting relation downward raising the natural rate of unemployment.
3. The general version of the Phillips curve presented in this exercise is:

$$\pi_t - \pi_t^e = (\mu + z) - \alpha u_t$$

The natural rate of unemployment is the unemployment rate such that the actual inflation rate is equal to the expected inflation rate.

Assuming that $\pi_t = \pi_t^e$ we obtain:

$$0 = (\mu + z) - \alpha u_n$$

Solving for the natural rate of unemployment:

$$u_n = \frac{\mu+z}{\alpha}$$

Rewriting equation (1) we have:

$$\pi_t - \pi_t^e = -\alpha(u_t - \frac{\mu+z}{\alpha})$$

$$\pi_t - \pi_t^e = -\alpha(u_t - u_n)$$

If the expected rate of inflation is well approximated by the last year inflation:

$$\pi_t - \pi_{t-1} = -\alpha(u_t - u_n)$$

In numbers:

$$\pi_t - \pi_{t-1} = -2(u_t - \frac{0.08+0.1\mu_t}{2})$$

The natural rate of unemployment in this case is the rate of unemployment required to keep the inflation rate constant: NAIRU (non-accelerating inflation rate).

Exercise 3

1. $\pi_t^e = 0$

$$\pi_t = 0.1 - 2(0.04) = 0.1 - 0.08 = 0.02$$

$$\pi_{t+1}^e = \pi_t$$

$$\pi_{t+1} = 0.02 + 0.1 - 0.08 = 0.04$$

$$\pi_{t+2}^e = \pi_{t+1}$$

$$\pi_{t+2} = 0.04 + 0.1 - 0.08 = 0.06$$

$$\pi_{t+3}^e = \pi_{t+2}$$

$$\pi_{t+3} = 0.06 + 0.1 - 0.08 = 0.08$$

2. The new equation for the Phillips curve when labour contracts are indexed is:

$$\pi_t = [\lambda\pi_t + (1-\lambda)\pi_{t-1}] + 0.1 - 2u_t$$

where λ is the proportion of labour contract that is indexed.

We know that half the workers have indexed labour contract ($\lambda = 0.5$):

$$\pi_t = [0.5\pi_t + 0.5\pi_{t-1}] + 0.1 - 2u_t$$

$$3. \pi_t^e = \pi_{t-1} = 0$$

$$\pi_t = 0.5\pi_t + 0.1 - 2(0.04) = 0.2 - 0.16 = 0.04$$

$$\pi_{t+1}^e = \pi_t$$

$$\pi_{t+1} = [0.5\pi_{t+1} + 0.5\pi_t] + 0.1 - 0.08$$

$$0.5\pi_{t+1} = 0.02 + 0.1 - 0.08$$

$$\pi_{t+1} = 0.08$$

$$\pi_{t+2}^e = \pi_{t+1}$$

$$\pi_{t+2} = [0.5\pi_{t+2} + 0.5\pi_{t+1}] + 0.1 - 0.08$$

$$0.5\pi_{t+2} = 0.04 + 0.1 - 0.08$$

$$\pi_{t+2} = 0.12$$

$$\pi_{t+3}^e = \pi_{t+2}$$

$$\pi_{t+3} = [0.5\pi_{t+3} + 0.5\pi_{t+2}] + 0.1 - 0.08$$

$$0.5\pi_{t+3} = 0.06 + 0.1 - 0.08$$

$$\pi_{t+3} = 0.16$$

4. Wage indexation increases the effect of unemployment on inflation.