

Principles of Economics and Management I

Ciências ULisboa · MMAEG · 2026/2027

Problem Set 9 · Unemployment, Inflation and the Labor Market

Session 9 · LN09

Exercise level: [Easy] routine / warm-up [Medium] typical test level [Hard] challenge (above test level, to consolidate mastery)

1. (2 points) [Easy] **Unemployment and participation rates.** In an economy with 10 million inhabitants, 8.5 million are aged 16 or over. Of these, 4.6 million are employed and 0.4 million are unemployed.
 - (a) (1 point) Compute the labor force and the unemployment rate.
 - (b) (1 point) Compute the participation rate.
2. (2 points) [Easy] **Discouraged workers.** Of those outside the labor force, 200 thousand have given up looking for work but would like a job.
 - (a) (1 point) If they resumed actively looking, what would the new unemployment rate be?
 - (b) (1 point) Explain why the official rate can *rise* at the start of a recovery.
3. (3 points) [Medium] **HICP and contributions to inflation.** Consider a simplified index with the following weights and price changes:

Item	Weight	Price change
Housing and energy	20%	+8%
Food	22%	+5%
Transport	15%	+2%
All other goods and services	43%	+1.5%

- (a) (1 point) Compute the headline inflation rate.
 - (b) (1 point) Compute each item's contribution, in percentage points.
 - (c) (1 point) Core inflation excludes energy and unprocessed food. Why?
4. (3 points) [Medium] **Nominal, real and disinflation.** A worker's nominal wage goes from €1200 to €1260, in a year in which inflation was 3.5%.
 - (a) (1 point) Compute the change in the real wage (approximate and exact).
 - (b) (1 point) Is the worker better or worse off?
 - (c) (1 point) If inflation falls from 5% to 2%, do prices fall? Distinguish the concepts.
5. (5 points) [Hard] **The Phillips curve with expectations.** Consider $\pi = \pi^e - 0.5(u - u_n)$, with a natural rate $u_n = 6\%$.
 - (a) (1 point) With $u = 4\%$ and $\pi^e = 2\%$, what is inflation?
 - (b) (2 points) The central bank holds $u = 4\%$ and expectations are adaptive ($\pi_t^e = \pi_{t-1}$). Describe the first four years.
 - (c) (2 points) Show that the long-run curve is vertical and draw the policy lesson.

6. (5 points) **[Hard] The minimum wage and wage rigidity.** In the labor market, $L^d = 1000 - 20w$ and $L^s = 100 + 30w$, with w in euros per hour.
- (a) (1 point) Find the equilibrium wage and employment.
 - (b) (2 points) A minimum wage of €20 is set. Compute employment and unemployment, and say who bears it.
 - (c) (2 points) What if the minimum wage were €16? Connect wage rigidity to structural unemployment.