

Principles of Economics and Management I

Ciências ULisboa · MMAEG · 2026/2027

Problem Set 11 · Monetary Policy

Session 11 · LN11

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

1. (2 points) [Easy] **Expansionary or contractionary?** Classify each measure and justify in one line.
 - (a) (1 point) (i) Raising the rate on the main refinancing operations. (ii) Buying bonds on the secondary market.
 - (b) (1 point) (iii) Raising the required reserve ratio. (iv) Announcing that rates will stay low for an extended period.
2. (2 points) [Easy] **The Taylor rule.** Consider $i = r^* + \pi + 0.5(\pi - \pi^*) + 0.5(y - y^*)$, with $r^* = 1\%$ and $\pi^* = 2\%$.
 - (a) (1 point) Compute the recommended rate with $\pi = 5\%$ and an output gap of $+1\%$.
 - (b) (1 point) Compute it with $\pi = 1\%$ and a gap of -2% . Comment.
3. (3 points) [Medium] **The Taylor principle.**
 - (a) (1 point) Show that, under the rule above, the *real* rate rises when inflation rises.
 - (b) (1 point) Why is that essential? What happens if the coefficient on π is below 1?
 - (c) (1 point) Compute the nominal and real rate with $\pi = 8\%$ and a zero output gap.
4. (3 points) [Medium] **The zero lower bound and quantitative easing.**
 - (a) (1 point) What is the zero lower bound and why does it constrain conventional policy?
 - (b) (1 point) How does QE get around that bound, and through which channels?
 - (c) (1 point) A 10-year zero coupon bond has a face value of €1000. If the rate falls from 3% to 2%, what is the change in price?
5. (5 points) [Hard] **The transmission mechanism.**
 - (a) (2 points) Describe the channels through which a 2 p.p. rise in the policy rate reaches inflation, and their timing.
 - (b) (2 points) A firm is evaluating a project with a perpetual flow of €50 thousand a year. Compute the present value at $r = 2\%$ and at $r = 4\%$ and explain the investment channel.
 - (c) (1 point) Why does monetary policy act with long and variable lags?
6. (5 points) [Hard] **The two levers when both are constrained.** Consider an economy in recession, with inflation at 1%, public debt at 130% of GDP and the policy rate already at 0%.
 - (a) (2 points) What options are left to monetary policy, and what are their limits?
 - (b) (2 points) And to fiscal policy? What constraints does the debt level impose?
 - (c) (1 point) Discuss the risk of fiscal dominance and why the separation of mandates matters.