

Principles of Economics and Management I

Ciências ULisboa · MMAEG · 2026/2027

Problem Set 13 · The Open Economy

Session 13 · LN13

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

1. (2 points) **[Easy] Comparative advantage across countries.** Per worker per year, Portugal produces 20 tons of cork or 5 machines; Germany produces 10 tons of cork or 10 machines.
 - (a) (1 point) Identify the absolute advantages and the comparative advantages.
 - (b) (1 point) Over what range of relative prices do both countries gain from trade?
2. (2 points) **[Easy] Appreciation and depreciation.** The exchange rate goes from 1.10 to 1.05 dollars per euro.
 - (a) (1 point) Did the euro appreciate or depreciate? Compute the percentage change.
 - (b) (1 point) What is the effect on Portuguese exporters and importers?
3. (3 points) **[Medium] Purchasing power parity.** The same basket costs €120 in the euro area and 150 USD in the United States. The market rate is 1.10 USD/EUR.
 - (a) (1 point) Compute the exchange rate implied by PPP.
 - (b) (1 point) Is the euro overvalued or undervalued? By how much?
 - (c) (1 point) Give two reasons why PPP fails in the short run.
4. (3 points) **[Medium] Interest rate parity.** The one-year rate is 3% in the euro area and 5% in the United States. The spot rate is 1.10 USD/EUR.
 - (a) (1 point) By covered parity, what is the one-year forward rate?
 - (b) (1 point) Is the dollar at a premium or a discount? Interpret.
 - (c) (1 point) If the market forward were 1.10, would there be arbitrage? Describe it.
5. (5 points) **[Hard] The balance of payments and the saving-investment identity.**
 - (a) (2 points) Show that $NX = S - I$ starting from the income identity.
 - (b) (2 points) An economy has private saving of 22% of GDP, investment of 24% and a public deficit of 3%. Compute the current account balance and interpret.
 - (c) (1 point) Why does the financial account mirror the current account?
6. (5 points) **[Hard] The carry trade.** An investor borrows €10 M at 3% and invests in US bonds at 5%, at an exchange rate of 1.10 USD/EUR, for one year and *without currency hedging*.
 - (a) (2 points) Compute the result if the exchange rate stays at 1.10.
 - (b) (2 points) Find the exchange rate that wipes out the gain, and the result if the euro appreciates to 1.20.
 - (c) (1 point) Why does the carry trade look profitable for a long time and then collapse?