MACROECONOMICS I

Homework Assignment #4

Deadline: **May 23nd**, **before** the class (12:00). No late submissions will be accepted.

Submission: a hard (printed) copy; no electronic versions will be accepted.

Problem 1. (20 points). Gross Domestic Product

Calculate by how much the GDP of the Czech Republic would change in each of the following situations:

1. A family sells a house in Brno, without using a broker, for 1.500.000 CZK. It could have rented the house on the open market for 7000 CZK /month. Then, the family byes a flat in the 10-years old apartment building in Prague for 2.000.000 CZK. The broker's fee on this transaction is 6 % of the selling price. The former owner of the apartment was renting it for 10.000 CZK / month.
2. On April 30th, you decided to stop spending 500 CZK per month on French Fries in McDonalds and buy the equipment, potatoes, and oil for 3000 CZK to make your own fries for the rest of the year.
3. You win 25.000 CZK in a lottery and decide to open a small business – an ice-cream stand. You spent 15.000 CZK on the ice-crème making machine produced by Gelato Ltd, Milan, and 10.000 CZK on the ice-cream stand produced by Skoda, the Czech Republic.
4. A music recording company produced 100.000 CDs which it sells for 400 CZK apiece. Out of them, 10.000 CDs the company sells abroad, while the rest of CDs remain on warehouse shelves.

Problem 2. (30 points). Economic growth in the long run

Suppose the economy described by Solow model has the following production function:

$$Y=K^{1/2}(AL)^{1/2},$$

Where Y is the output, K is the productive capital, L is the labor force, and A is the efficiency of labor. Assume that the labor efficiency is an exogenous variable and it grows every year by 2 %.

1. For this economy, derive the expression for the GDP per capita as a function of the capital/labor ratio (small y). Can the model account for the growth of the GDP (Y) and GDP per capital (y) in the steady state? Explain using the derived expression. N!B! Remember, GDP per capital and GDP per effective units of labor are two different measures.

- Growth accounting. Suppose an economy described by Solow model is in the steady state with population growth n of 1.8 % per year and technological progress g of 1.8 % per year. Total output (Y) and total capital (K) grow at 3.6 % per year. Suppose further that the capital share of output is 1/3. Use the growth-accounting equation $\Delta Y = \frac{MP_K \cdot K}{Y} \cdot \Delta K + \frac{MP_L \cdot L}{Y} \cdot \Delta L$

to divide output growth into three sources – capital, labor, and total factor productivity.

Problem 3. (20 points). IS-LM model

Suppose the Czech government decided to cut taxes in order to stimulate the Czech economy. What monetary policy can the Czech National Bank undertake to achieve the largest expansionary impact (both immediately and in the short-run)? Illustrate *all possible combinations* of two policies and explain which policy mix will be the most appropriate. Use the IS-LM diagram for your answers.

Problem 4. (30 points). The open economy

1. Consider an exchange rate between Czech crown and Euro. Assume that Czech National Bank starts a contractionary monetary policy. Illustrate the effect of this contractionary policy on the exchange rate of Euro and CZK. What is the overall effect of the policy and changes in the exchange rate on the *aggregate demand* in Czech Republic?
2. Trade policy and exchange rate regimes. Suppose that the government of China reduced imports from the US by taxing imports (introducing import tariffs). Recall that China maintains a fixed exchange rate between the Yuan and the USD. What effect would the import tariff have on the trade balance of China and on the Chinese economy as a whole? Hint: Think carefully about the consequences of the government intervention in the FOREX for the Chinese economy and the money market in particular.
3. Will your results from 2. hold if China had a floating exchange rate instead of the fixed exchange rate regime. Explain.