# Exercise Sheet 2

1. Assume the following IS-LM-Model:

$$C = 200 + 0.25Y_V$$

$$I = 150 + 0.25Y - 1000i$$

$$G = 250; T = 200$$

$$\left(\frac{M}{P}\right)^D = 2Y - 8000i$$

$$\frac{M}{P} = 1600$$

   (a) Determine the IS-equation.

   (b) Determine the LM-equation.

   (c) Caluclate the equilibrium value of real income.

   (d) Calculate the equilibrium interest rate.

   (e) Calculate the equilibrium values of $C$ and $I$ and check whether the result for $Y$ equals the sum of $C$, $I$ and $G$.

   (f) Now assume that money supply is increase to $M/P = 1840$. Solve for $Y$, $i$, $C$ and $I$ and verbally describe the impact of expansive monetary policy.

   (g) Let $M/P$ take again its original value of 1600. Assume that government expenditures increase to $G = 400$. Explain the impact of expansive fiscal policy on $Y$, $i$ and $C$.

2. Assume the following demand functions for consumption, investment and money:

$$C = 80 + 0.8(Y - T)$$

$$I = 150 - 1000i$$

$$\left(\frac{M}{P}\right)^D = 0.2Y - 1000i$$

   The price level is fixed at $P = 1$.

   (a) Government expenditures are at $G = 100$ and the public budget is balanced. Real money supply is $M/P = 50$. Determine the IS- and LM-equations and draw them in a picture.

   (b) Calculate the interest rate for which goods-, money- and financial markets are cleared and determine the levels of disposable income, consumption and investment.

   (c) Assume that government expenditures increase to $G = 250$, where the difference is financed through loans. Calculate interest rate, income and investment in the new equilibrium and determine private savings after the increase in government expenditures.

(d) Compare the situation in (c) with a situation in which government expenditures are financed through an increase in taxes $T$. What impact does this have on private savings? Why does this lead to a decrease in investment?

3. Assume the markup of firms on costs to be 5%. The wage-setting relation is given by $W = P(1 - u)$ where $u$ denotes the unemployment rate.

   (a) What real wage does the wage-setting relation imply?

   (b) Determine the natural unemployment rate.

   (c) Assume the markup increases to 10%. How does the natural unemployment change? Explain the realtionship.

4. An economy is given by the following equations:

$$i = 30 - 0.02Y$$

$$i = 0.08Y - 0.05(M/P)$$
$$Y = Y_n + 10(P - P^e)$$

   Money in equilibrium is given by $M = 200$. The natural level of output is $Y_n = 500$. Assume adaptive expectations.

   (a) Determine the price level in the medium run equilibrium.

   (b) Assume the equilibrium in (a). The central bank increase money to $M' = 300$. Calculate the price level in the new medium run equilibrium.

   (c) Explain graphically the dynamic process that occurs when moving from the equilibrium in (a) to the new equilibrium. Describe how $Y$, $P$ and $i$ change during this process.

   (d) What do you think about the use of monetary policy in the given situation? Explain pros and cons of such a policy. In which situation would definitely agree to use it?

5. Assume the Phillips-curve to be given by

$$\pi_t = \pi_t^e + 0.1 - 2u_t$$

   where $\pi_t^e = \pi_{t-1}$. Also assume that in year $t$ the inflation rate is at 0%. In year $t$ government decides to keep the unemployment permanently at a level of 4%.

   (a) Calculate the inflation rate for the years $t$, $t + 1$, $t + 2$ and $t + 3$.

   Now assume that half of the workers have indexed working contracts.

   (b) Determine the new equation for the Phillips-curve.

   (c) Provide an answer to (a) again.

   (d) Explain the impact of indexed wages on the relationship between $\pi$ and $u$?