

Matr.-Nr. \_\_\_\_\_

Name: \_\_\_\_\_

Examination

20044: Macroeconomic Analysis II

Semester:

Winter Semester 2009/10

Examiner:

Prof. Dr. Gerhard Schwödiauer

The following aids may be used:

None.

Time:

120 minutes

The examination comprises three problems: You are supposed to solve problems 1 and 2; problem 3 is a “bonus problem” for the solution of which you can earn extra credit.

**Examination Questions:**

1. Consider a closed economy with firms producing a homogeneous good, which may be consumed or used for investment purposes, according to a Cobb-Douglas production function with capital and labor inputs. Factor productivities do not change, and population remains constant (i.e., may be normalised to 1).

There are many identical consumers which maximise

$$E_0 \left[ \sum_{t=0}^{\infty} \beta^t u(c_t, m_{t+1}, 1-l_t) \right], \quad 0 < \beta < 1,$$

where  $l_t$  is the household's labor supply,  $m_{t+1} = M_{t+1} / P_t$  denotes the real money balances at the end of period  $t$  and

$$u(c_t, m_{t+1}, 1-l_t) = \ln c_t + \mu \ln m_{t+1} + \lambda_t \ln(1-l_t).$$

The consumers pay a lump-sum real tax  $\tau_t$ ; they invest in the capital stock which depreciates at a rate  $0 < \delta < 1$ , and may borrow or lend at a nominal interest rate  $i_t$ .

Derive the private sector's demand and supply functions for goods, labor, money and bonds!

(Initial conditions for per-capita and aggregate variables are:  $k_0 > 0$  for capital,  $M_0 > 0$  for the stock of nominal money and  $B_0 = 0$  for the stock of nominal bonds.)

2. Assume that real government consumption is

$$g_t = \gamma_t \cdot y_t, \quad 0 < \gamma_t < 1,$$

where  $y_t$  is real output (aggregate or per capita – equivalent for size of population = 1!), and

$$\gamma_t = \gamma + \varepsilon_t,$$

with  $\varepsilon_t$  being “white noise” with  $E\varepsilon_t = 0$ . Assume further that the government’s tax policy is given by

$$\tau_t = g_t \text{ for all } t.$$

The government does not issue any bonds.

- a) Derive the aggregate market equilibrium conditions (for goods, labor, bond and money markets)! How do government expenditure shocks affect the endogenous variables? (Discuss!)
- b) Determine the properties of the non-stochastic steady state!
- c) Assume that the initial  $k_0$  is smaller than the steady-state  $k$ . What can you say about the evolution of the real variables, the nominal interest rate  $i_t$ , the price level  $P_t$ ?

3. Assume that the government’s tax policy is

$$\tau_t = 0 \text{ for all } t.$$

and the government nevertheless does not issue bonds. How does this change your conclusions about the equilibrium behaviour (transition and steady state) of the economy?

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