

**UNIVERSITY OF OSLO**  
**DEPARTMENT OF ECONOMICS**

Exam: ECON4325 – Monetary policy and business fluctuations, spring 2005

Date of exam: Wednesday, June 1, 2005     *Grades will be announced: Wednesday, June 15*

Time for exam: 2:30 p.m. – 5:30 p.m.

The problem set covers 3 pages

Resources allowed:

- No resources allowed

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

The exam consists of two parts: A and B. Both parts carry equal weights. You should answer both parts.

Part A consists of four questions, of which you shall answer three. You can choose yourself which question you will leave out. Answer briefly, intuitively and precisely.

Part B consists of one question. Answer in depth and in detail.

## **PART A**

### **Question 1**

Define and explain how one can measure potential output and the output gap. Explain why the output gap is a central concept in inflation-targeting monetary-policy.

### **Question 2**

Briefly explain the concept of driving force and persistence in the Real Business Cycle (RBC) models. How are these models evaluated against empirical data? Do they provide a convincing explanation of the stylized facts of business cycles?

### **Question 3**

Explain why a discretionary monetary policy can be subject to the dynamic inconsistency problem. How can one solve this problem?

#### Question 4

Describe the empirical effects of monetary policy in an open economy. How effective is monetary policy in stabilizing the real economy if there is inflation inertia?

### PART B

#### Monetary policy – Instrument choice and policy rules

Assume a basic IS-LM model represented by (1) an aggregate demand relationship and (2) demand for money

$$y_t = -\alpha i_t + \varepsilon_t \quad (1)$$

$$m_t = y_t - \beta i_t + \eta_t \quad (2)$$

where  $y_t$  is output,  $i_t$  is the interest rate,  $m_t$  is money supply and  $\varepsilon_t$  and  $\eta_t$  are mean zero disturbances that are uncorrelated with each other and have variances given by  $Var(\varepsilon_t) = \sigma_\varepsilon^2$ ,  $Var(\eta_t) = \sigma_\eta^2$  respectively.

Assume policy makers objective is to minimize the variance of output deviations, given by the objective function

$$E(y_t)^2, \quad (3)$$

where all variables have been normalized so that the economy's equilibrium level of output in the absence of shocks is  $y=0$ .

*Compare and derive the value of the objective function under both a money supply operating procedure and an interest rate operating procedure.*

*Under what conditions is an interest rate procedure preferred to a money supply procedure?*

Further, assume the Central Bank has no control over money supply but instead control a narrow aggregate like base money

$$m_t = b_t + \chi_t, \quad (4)$$

where  $b_t$  is base money and  $\chi_t$  is a random money-multiplier disturbance with mean zero and variance given by  $Var(\chi_t) = \sigma_\chi^2$ . The authorities now decide to follow a simple policy rule

$$b_t = \lambda i_t \quad (5)$$

*Find expressions for the interest rate and output given this rule. Show that the optimal policy rule (in the sense of minimizing the variance of output) is given by:*

$$\lambda^* = -\beta + \frac{\alpha(\sigma_\eta^2 + \sigma_\lambda^2)}{\sigma_\varepsilon^2} \quad (6)$$

*Interpret the equation.*

*An alternative to the instrument rule (as that studied above) is a targeting regime. Explain briefly the main differences between a targeting regime and an instrument rule? List the characteristics of a typical inflation-targeting monetary-policy regime.*