UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: ECON4325 - Monetary policy and business fluctuations

Date of exam: Wednesday, May 31, 2006 **Grades will be given: Wednesday, June 14**

Time for exam: 09:00 a.m. – 12:00 noon

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 potential output and the output gap. Explain briefly how one can extract both components from the data.

Question 2

Discuss to what extent a standard Real Business Cycle (RBC) model driven by technology shocks and intertemporal substitution of leisure is able to generate the joint behaviour (positive correlation) of real wages, employment and output that is observed over the business cycle.

Question 3

Briefly discuss how one can solve the problem of dynamic inconsistency of a discretionary monetary policy. Why may it be beneficial for an inflation targeting central bank to commit itself to a certain interest rate path (i.e. publishing interest rate prognosis like Norges Bank has recently done)?

Question 4

Explain the main differences between a targeting regime and an instrument rule. Briefly emphasize the transmission channels for monetary policy that exist in an open inflation-targeting economy (like Norway).

PART B

Monetary policy operating procedures

Assume an IS-LM model that is represented by (1) an IS equation and (2) a LM equation:

$$y_t = -ai_t + u_t \qquad (1)$$

$$m_t = -bi_t + cy_t + v_t \qquad (2)$$

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

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

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

where all variables have been normalized so that the economy's equilibrium level of output in the absence of shocks is *y=0*. Assume the following timing: The Central Bank decides on either m_t or i_t at the start of the period. The shocks then occur, determining the values of the endogenous variables.

Derive the value of the loss function under both a money-supply operating procedure and an interest rate operating procedure.

Show and explain why $E(y_t)^2$ is minimised when $m_t=0$ under a money-supply operating procedure and $i_t=0$ under an interest rate operating procedure.

Under what conditions is an interest rate operating procedure preferred to a money-supply operating procedure? Interpret your results. What procedure is preferable if the income elasticity of money demand is large?

Further, assume instead that the shocks are now serially correlated (but still uncorrelated with each other):

$$u_t = p_u u_{t-1} + \varepsilon_t \tag{4}$$

$$v_t = p_v v_{t-1} + \gamma_t \tag{5}$$

where ε_t and γ_t are white noise processes.

Derive the optimal value of m_t that minimises the loss function under a money-supply operating procedure and the optimal value of i_t that minimises the loss function under an interest rate operating procedure. Interpret the results and compare the results with those in (b).