UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Term paper in: **ECON4325 - Monetary Policy and Business Fluctuations**

Handed out: Friday, March 24, 2006

To be delivered by: Friday, April 7, 2006

Place of delivery: Department office, 12th floor

Further instructions:
- This term paper is **compulsory**. Candidates who have passed the compulsory term paper in a previous semester, does not have the right to hand in the term paper again. This is so, even if the candidate did not pass the exam.
- You must use a printed front page, which will be found at http://www.oekonomi.uio.no/info/EMNER/Forside_obl_eng.doc
- It is of importance that the term paper is delivered by the deadline (see above). Term papers delivered after the deadline, **will not be corrected**.*)
- All term papers must be delivered to the place given above. You must not deliver your term paper to the course teacher or send it by e-mail.
- If the term paper is not accepted, you will be given a new attempt. If you still not succeed, you will not be permitted to take the exam in this course. You will then be withdrawn from the exam, so that this will not be an attempt.

*) If a student believes that she or he has a good cause not to meet the deadline (e.g. illness) she or he should discuss the matter with the course teacher and seek a formal extension. Normally extension will only be granted when there is a good reason backed by supporting evidence (e.g. medical certificate).

Term paper 2006

ECON 4325 – Monetary policy and business fluctuations

Part A) Answer all questions briefly

1. *Does the high correlation between money growth and inflation mean that inflation is always caused by money growth? List the additional transmission channels for monetary policy that exist in an open economy compared to a closed economy.*

2. *How effective is monetary policy in stabilizing the real economy if there is inflation inertia?*

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

Part B) Long question.

Consider a Cobb-Douglas production function, where Y_t is output, K_t is capital and L_t is labour. Technology ω_t enters the production function as a third factor of production (so-called Hicks-neutral growth):

$$Y_t = \omega_t K_t^{\alpha} L_t^{1-\alpha}, \qquad\qquad 0 < \alpha < 1 \qquad\qquad (1)$$

1. *What do we mean by the Solow residual and how can we interpret the residual in terms of equation (1)?*

Assume that capital follows the process:

$$K_{t+1} = (1-\delta)K_t + \omega_t K_t^{\alpha} L_t^{1-\alpha} - C_t. \qquad\qquad (2)$$

Further, let capital depreciate fully at the end of each period (hence: $\delta=1$). Utility is assumed to be logarithmic:

$$u(C_t, 1-L_t) = \log C_t + \mu \log(1-L_t), \qquad \mu \geq 0. \qquad\qquad (3)$$

There is no unemployment so $1-L_t$ equals leisure. The maximisation problem becomes:

$$\max_{\{C_\tau, L_\tau\}_{\tau=t}^{\infty}} : E_t \left[\sum_{\tau=t}^{\infty} \beta^{\tau-t} (\log C_\tau + \mu \log(1 - L_\tau)) \right]$$

$s.t.:$

$$K_{t+1} = \omega_t K_t^\alpha L_t^{1-\alpha} - C_t$$

2. *Specify the Bellman equation for this maximum problem and calculate the first order conditions and the envelope condition.*

3. *Find the optimal consumption profile and the level of labour supply.*

4. *Let there exist a constant saving ratio, s, so that $C_t=(1-s)Y_t$ satisfies this condition for an optimal consumption profile. Show that a constant savings ratio and inelastic labour supply will be the outcome of this intertemporal maximisation under rational expectations. What does this imply for the degree of persistence predicted by a standard real business cycle model?*