UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Term paper in: **ECON4350 – Growth and investment**

Handed out: Thursday, March 22, 2007

To be delivered by: Thursday, April 12, 2007 **at 01:00 – 03:00 p.m.**

Place of delivery: Next to SV-info-center, ground 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
- **Note:** You can write an individual paper, or hand in joint work (gruppebesvarelse). However, we do not allow more than 3 students in each group! **Please use only one front page!**
- 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 You will then be withdrawn from the exam, so that this will not be an attempt.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).

ECON 4350: Growth and Investment
Assignment for term paper

Department of Economics, University of Oslo

Spring 2007

Groups of one two or three students can submit a joint paper (only hand in one copy). Remember to provide the relevant data for all participating students on the front page. You can write your paper in either English or Norwegian. Strive to make your answers to the questions short and to the point.

Problem 1

In this exercise you are asked to consider a competitive equilibrium in an economy with utility-maximizing households, profit-maximizing firms, and a government that runs balanced budgets at all points in time:

$$G + V = \tau_w wL + \tau_a r \cdot (\text{assets}) + \tau_c C + +\tau_f \cdot (\text{firm's earnings})$$

You should take as your starting point the model presented in lecture note 4 (Section 8.3). The notation used in this exercise adheres to the notation introduced there.

(a)

Households maximize the utility function

$$U = \int_{t=0}^{\infty} u(c(t))L_h(t)e^{-\rho t}dt \tag{1}$$

Where $c(t)$ equals the consumption level of *each* household member and $L_h(t)$ is the size of the household (below $L_h(t) \equiv e^{nt}$). Discuss the interpretation of this formulation of preferences.

(b)

Assume that the utility function is of the CRRA-type, with the constant relative risk aversion denoted by θ. The per capita budget of the household is

$$\dot{a} = (1 - \tau_w) \cdot w + (1 - \tau_a) \cdot ra - (1 + \tau_c) \cdot c - na + v \tag{2}$$

Formulate the optimization problem facing the household. Show that the solution satisfies the Euler-equation

$$\frac{\dot{c}(t)}{c(t)} = \frac{(1 - \tau_a)r - \rho}{\theta} \tag{3}$$

Discuss the interpretation of this condition.

(c)

Show that in equilibrium

$$\dot{\hat{k}} = f(\hat{k}) - \hat{c} - (x + n + \delta)\hat{k} - \hat{g} \tag{4}$$

(d)

Characterize graphically the equilibrium of the economy, i.e. the paths $\{\hat{k}(t), \hat{c}(t)\}$.

(e)

Discuss reasons why we might want to model public spending differently. (But stick to the original formulation in the analysis below.)

(f)

Outline how you could incorporate human capital into the model as an additional accumulated input to production. Would this change your analysis in important ways?

(g)

Explain the effects of an unanticipated and permanent increase in the tax on consumption, i.e. τ_c.

(h)

Explain the effects of an unanticipated and permanent increase in the tax on asset income, i.e. τ_a.

(i)

Explain the effects of an unanticipated and permanent increase in public spending, i.e. g.

(j)

What if the increase in public spending was anticipated?

(k)

What if the increase in public spending was unanticipated, but temporary?

(l)

Over the period 1740–1918 the UK real interest rate tends to be high during war years. Can you explain this based on the analysis above?

Problem 2

You are an advisor to the Minister of Finance in Bugrica. She is concerned about improving economic growth in her country. She has come across the paper by Easterly and Levine (2001) [On the reading list] and wants you to give her a briefing on the paper. You are expected to produce a report of a maximum of 3 pages. The Minister is familiar with basic general economics, but knows very little about theories of growth and does not like maths. However, she is quite smart and understands a clear argument quickly. You should focus on the following:

1. Provide the background for the paper, i.e. why are the questions raised important for her concern for economic growth in her country.
2. Summarize the arguments (theoretical/empirical) in the paper.
3. Evaluate these arguments in light of your knowledge of growth theory and empirics.

4. Discuss possible implications for policy. Keep in mind that your summary might have a direct impact on her decisions on economic policy.

N.B.: You can ignore Section V of the paper. But you are encouraged to skim through it for a quite interesting read.

References

Easterly, William and Ross Levine, "It's Not Factor Accumulation: Stylized Facts and Growth Models," *World Bank Economic Review*, 2001, *15* (2), 177–219.