

UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Term paper in: **ECON3410/4410 – Introductory dynamic macroeconomics**

Handed out: Tuesday, September 25, 2007

To be delivered by: Tuesday, October 9, 2007 **at 12:00 – 2:30 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 You will then be withdrawn from the exam, so that this will not be an attempt.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).

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ECON 3410/4410: Introductory Dynamic Macroeconomics. Term paper, autumn 2007.

This term paper will be marked as 'passed or 'failed'. To get a 'pass' you must answer question 1 and *some* of question 2 and 3.

You can write an individual paper, *or* hand in joint work ('gruppebesvarelse'). However we do not allow more than 3 students in each group! You can write in English, Norwegian, Danish or Swedish.

Technical requirements:

Use a Times Roman font, size 12, for all standard text. Mathematical formulae can be handwritten, and graphs may be handdrawn. Note that special requirements apply to question 1 (the number of words, see below).

Full name(s) should be *clearly printed* at the top of the first page of your term paper, together with the name of the course (For example: Home assignment to ECON 3410, by NN and NN.)

Where and when to hand in: Tuesday 9 October 2007. See cover page for details. If a student believes that she or he has a good cause not to meet the deadline (e.g. illness), she or he should report the matter to 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).

1. Discuss the following statement: "Dynamic models are essential to macroeconomic analysis".

The number of words should not exceed 2500 words. Give the number of words (for example using the word count function in MS-Word) in a footnote. Graphs and formulae do not count as words.

2. Consider the two equation model:

$$(1) \quad X_t = \underset{<0}{a} P_t + b_0 + b_1 z_t + \varepsilon_{d,t}, \quad \text{demand, and}$$

$$(2) \quad X_t = \underset{>0}{c} P_t^e + d + \varepsilon_{s,t}, \quad \text{supply.}$$

where the symbols take the same meaning as in quotation (1.1) and (1.2) in IDM with the following modifications: P_t^e denotes the expected price in period t . b_0 is the intercept term of the demand equation, $b_1 > 0$ is the partial derivative of demand with respect to the exogenous economic variable z_t .

Consider two hypotheses for P_t^e : H1) $P_t^e = P_t$ and H2) $P_t^e = P_{t-1}$.

- (a) Comment briefly on the possible economic interpretations of the two hypotheses.
- (b) Compare how the two endogenous variables react to a one-period positive shock to demand, depending on whether H1) or H2) applies.

- (c) Compare how the two endogenous variables react to a permanent shock to demand, depending on whether H1) or H2) applies.
 - (d) Give the mathematical conditions for stability of the system in the case of H2) $P_t^e = P_{t-1}$.
3. Assume a small open economy with a fixed exchange rate, and that one single wage rate applies to all sectors of the economy. The natural logarithm of the wage rate in period t is denoted w_t . Let mc_t denote the main-course variable (as explained in IDM), and let U_t denote the rate of unemployment (not in logs).

Assume the following model for the wage rate:

$$(3) \quad \Delta w_t = \beta_{w0} + \beta_{w1}U_t + \beta_{w2}\Delta mc_t - (1 - \alpha_w)(w_{t-1} - mc_{t-1}) + \varepsilon_{w,t}$$

where $\varepsilon_{w,t}$ represents an exogenous (and random) disturbance term. Remember that $\Delta w_t = w_t - w_{t-1}$, and $\Delta mc_t = mc_t - mc_{t-1}$. Assume that U_t is an endogenous variable, and that the following equation:

$$(4) \quad U_t = \beta_{u0} + \alpha_u U_{t-1} + \beta_{u1}(w - mc)_{t-1} + \beta_{u2}z_t + \varepsilon_{u,t} \quad \beta_{u1} \geq 0$$

together with (3) define a system that determines w_t and U_t . z_t denotes an exogenous variable, representing government policy for example.

- (a) Give signs to the coefficients of the system (ie. those not already signed), and explain your reasoning very briefly.
- (b) Assume that the system is dynamically stable. What are the effects of a permanent change in z_t ?
- (c) Replace (3) with a wage Phillips curve. How does this change in the model specification affect your answers to (b)?
- (d) Is there a “natural rate of unemployment” in one of both of these models (meaning that the equilibrium level of unemployment is independent of the rate of inflation)?
- (e) Simplify the system by setting $\alpha_u = 0$. What are the dynamic responses of w_t , U_t , and Δw_t to a permanent increase in the main-course variable mc_t ?