

# Economic Dynamics

## Homework 6: Due November 25, 2016, 11:00am

### Requirements

Submit your homework *by email to*

"Economic Dynamics" <dynamics-hw@turnbull.sk.tsukuba.ac.jp>

The **Subject:** should be FH21051 Homework #6 (in hankaku romaji). Use this class number, even if you are registered according to a different code. Your email must contain your *name* and *student ID number*.

### Problems

1. Consider the Cobb-Douglas production function with *Hicks-neutral* technological progress:

$$F(K, L, \lambda) = A_0 e^{\lambda t} K^\alpha L^{1-\alpha}.$$

- (a) Show that for appropriate constants  $B_0$  and  $\beta$  the Hicks-neutral technological progress can be expressed as a production function with *Solow-neutral* technological progress:

$$F(K, L, \beta) = B_0 (e^{\beta t} K)^\alpha L^{1-\alpha}.$$

- (b) Show that for the appropriate constants  $C_0$  and  $\gamma$  the Hicks-neutral technological progress can be expressed as a production function with *Harrod-neutral* technological progress:

$$F(K, L, \gamma) = C_0 K^\alpha (e^{\gamma t} L)^{1-\alpha}.$$

2. Explain why Solow-neutral technological progress is also called *capital-enhancing* technological progress. Use the equation in your answer.
3. Explain why Harrod-neutral technological progress is also called *labor-enhancing* technological progress. Use the equation in your answer.
4. Explain why the method used to adapt Solow's analysis to Harrod-neutral technological progress will *not* work for Solow-neutral technological progress. *Hint: the answer I have in mind uses the idea of exogenous and endogenous variables. There are probably other good ways to explain it, however.*