

**HANOVER COLLEGE.**  
**ECON 214: INTERMEDIATE MACROECONOMIC THEORY**  
**EXAM 2.**

- Credit will not be given unless **you show your work/calculations.**
- All answers should be in the blue book. One answer per page ( a,b,c etc. should be on same page, if possible).
- Make sure you label all curves and axis in your graphs.

Total points: 61

1. (16 points). Given the following model:

$$Y_t = 10 * K_t^{.4} L_t^{.6} \quad \text{where } Y \text{ is output, } K \text{ is capital stock and } L \text{ is labor.}$$

$$K_{t+1} = I_t + (1-d)K_t \quad \text{where } I \text{ is investment and } d \text{ the rate of depreciation.}$$

$$y_t = c_t + s_t \quad \text{where } y \text{ is output per worker, } c \text{ and } s \text{ are consumption and savings per worker.}$$

- a) Derive the production function per worker. (3 pts).
- b) If the rate of depreciation is 10% (0.10), growth in the labor force is 4% (0.04), no growth in efficiency and the savings rate is 30% (0.30), what are the steady states values for the capital stock per worker, output per worker and consumption per worker? (9 pts).
- c) Graphically illustrate the steady state. Also, indicate the level of consumption in the graph. (4 pts).

2. (12 points) Use the model in question 1 but now assume the saving rate is reduced to 25%.

- a) Compute the immediate effects on consumption per worker. (2 pts.).
- b) Compute the effects on the capital stock for the year following the reduction in savings rate. (2 pts).
- c) Show the effects on output per worker and consumption per worker over time ("time" on the horizontal axis). (4 pts).
- d) Show the effects on the growth rate in output and the growth rate in output per worker over time. Do the growth rates change permanently as a result of a lower savings rate? Why or why not? (4 pts.).

3. (10 points). In 2001, GDP per capita was \$31,000 in U.S. and \$21,00 in Spain. Use the Solow growth model and provide two explanations (and support your answer with graphs) for why GDP per capita is higher in the U.S.. Assume the depreciation rate, the savings rate and the rate of efficiency growth is the same in U.S. and Spain.

4. (3 points). Alan Greenspan, the former FED chairman, argued time and again for fiscal responsibility and repeatedly warned against persistent budget deficits. If the (federal) government were to reduce the budget deficit, show graphically and explain verbally the effects on the long-term path (trend) of output. Assume the long-run output growth is 3% prior to the reduction in the deficit.

5. (12 points). Consider the following statements and carefully explain if the statements are true, false or if they depend.

- a) "Increasing savings (and investment) will generate a sustained growth in average income"
- b) "In the Solow growth model, an increase in the savings rate will always increase consumption per worker (in the long run)".

6. (8 points). Suppose the U.S. economy is operating at the "full employment" point.

- a) How would a reduction in velocity impact the economy in the short-run? Support your answer with a graph and explain the graph. Also, explain the effects on the unemployment rate in the short-run.
- b) Explain how the economy would "self correct" itself over time (i.e. explain why the economy will return to "full employment").