

## The Solow Model: Problems

1. The Solow Model uses a production function that results from a specific set of assumptions. Which of these assumptions do you believe is the weakest?
2. Suppose that total factor productivity increases while labor decreases. Recall the graph of the production function that places output on the vertical axis and capital on the horizontal axis. How do these changes affect the position of the production function in this graph?
3. True or False? The Solow Model is a poor macroeconomic model because it does not explain why unemployment is above its natural rate as of Fall 2013.
- 4a. Analyze the effect of a decrease in TFP using the Solow Model. You should discuss how the steady state changes, and how the economy behaves as it converges to its new steady state.
- 4b. Analyze the effect of a decrease in the rate of depreciation using the Solow Model. You should discuss how the steady state changes, and how the economy behaves as it converges to its new steady state.

Suppose that the production function takes the following functional form:

$$Y_t = AK_t^\alpha L_t^{1-\alpha} \quad (1)$$

5. Obtain the intensive form of the production function. [Hint: For #5-7, inserting  $\alpha = \frac{1}{3}$  should return the results from class.]
6. Solve for the steady state levels of per-capita capital, output, and consumption for this functional form.
7. Using a first-order Taylor Series expansion around the steady state, describe the transition dynamics of this version of the model.
8. What are the advantages and disadvantages of this version of the model, relative to the version from class where  $\alpha = \frac{1}{3}$ ?
9. True or False. Based on the Solow Model, macroeconomic performance improves as a country's savings rate increases.
10. Using the Solow Model, what would happen if Gary from *Teen Mom* were named Chairman of the Federal Reserve?