Problems for Week 4

These problems come from Chapter 6 of the text, but some known typos have been corrected.

Data for this exercise are available on the course website under the link for Chapter 6 (insert web link here). Before starting these exercises, the student should review the relevant portions of the Guide to Working with Economic Data: sections G.12, G.13, and G.16.

Problem 6.1. Imagine that Florida was an independent country and that a series of hurricanes destroyed 10 percent of its capital stock (while miraculously not harming any person). Use production function diagrams to show what this disaster would imply for (i) the level of GDP; (ii) labor productivity; and (iii) capital productivity. Assume that the labor force is fixed and fully employed.

Problem 6.2. Using a Cobb-Douglas production function for the United States, calibrated to the values of 2003, what would you predict ceteris paribus would be the quantitative effects of a 10 percent fall in the capital stock on (i) the level of GDP; (ii) labor productivity; and (iii) capital productivity.

Problem 6.5. Using appropriate annual data for the United States, compute the time series (1948-2007) for total factor productivity ($A$), labor productivity, and capital productivity. (Assume that the labor share is constant at $\alpha = 0.69$.) Compute the average rate of growth of each (compound annual rates). What do your calculations suggest about the sources of productivity growth?

Problem 6.6.

(a) Using the same data and calculations from Problem 6.5, compute the implied real wage in 1948, 1978, and 2007.


(c) Compare the result for 1948-2007 to your computation of the growth rate of the average product of labor in Problem 6.5. Explain your finding.

(d) The U.S. economy is often characterized favorably compared to European economies as a “job creation machine.” What light do the data in parts (a) and (b) shed on the costs of this success. (Be careful to relate your conclusions to specific data.)
Problem 6.11. Economists widely believe that sometime in the 1960s or 1970s productivity growth slowed down and that sometime in the mid 1990s it speeded up again. Using the U.S. government's official productivity series and any appropriate statistical tool determine the date or dates, if any, of a slowdown or speedup in labor productivity.

Problem 6.12. Using the dates determined in the Problem 6.11, calculate the average rates of growth of labor productivity for each of the periods that you have identified. Describe the pattern of your findings.