Introductory Macroeconomics

Pre-Tutorial #7
Week Starting 26th April 2021

The Tutorial. This week's tutorial looks at saving, investment, and production function.

Note that your tutor is under no obligation to go through the answers to the pre-tutorial work in detail. The focus in the tutorial will be on the tutorial work itself – the questions here are preparatory.

Reading Guide. You should look carefully over lecture 13 and 14. You may also find Chapter 4, 13, and 14 of BOFAH useful.

Key Concepts. Stock and flow. Saving and investment. Cobb-Douglas production function.

Problems.

1. Distinguish between a "stock" and "flow" as concepts. Describe the following economic variables as describing either a "stock" or a "flow":

   - GDP
   - Savings
   - Wealth
   - Investment

2. Demonstrate that, in a closed economy with no government, the level of national saving is equal to the level of investment.

3. In the lecture, we assumed that firms maximise profits by selecting a level of capital to use in the production process. Suppose $Y = 2K^{1/2}$. What is the level of profits as a function of K in this setting? What is the optimal value of K as a function of the interest rate, the rate of depreciation and the price of output?

4. To a large extent, the level of output per person determines living standards. Why do economists consider growth in average labour productivity to be the key factor in determining long-run living standards?

5. The Cobb-Douglas production function is given by $Y = AK^{\alpha}L^{(1-\alpha)}$. Here α is a given parameter that satisfies $0 < \alpha < 1$.

   (a) Find the marginal product of capital. Show that there are diminishing marginal product of capital.

   (b) What do we mean by the phrase, "constant returns to scale"? How is this concept different to the concept of "diminishing marginal product"?

   (c) Show that the Cobb-Douglas production function displays constant returns to scale and that the level of output per worker can be written as a function of the level of capital per worker.