Problem Set #3

1. In June 1995 Clyde Prestowitz (Trading Places) of the Economic Strategy Institute made the following statement to a Senate subcommittee:

“Trade deficits of the size America is presently running with Japan and the rest of the world matter decisively to American prosperity. By limiting the exports of highly competitive American companies, the foreign barriers in large measure responsible for these deficits hold down investment in the export industry.”

Use the long run model of a small open economy. Comment on what you find accurate and inaccurate about this statement.

2. If a war broke out between Britain and Europe over Brexit, it would affect the U.S. economy in many ways. Use the model of the large open economy to examine each of the following effects of such a war. What happens in the United States to saving, investment, the trade balance, the interest rate, and the exchange rate? Consider each of the following effects separately.
   a. The U.S. government, fearing it may need to enter the war, increases its purchases of military equipment.
   b. Other countries raise their demand for high-tech weapons, a major export of the United States.
   c. The war makes U.S. firms uncertain about the future, and the firms delay some investment projects.
   d. The war makes U.S. consumers uncertain about the future, and the consumers save more in response.
   e. Americans become apprehensive about traveling abroad, so more of them spend their vacations in the United States.
   f. Foreign investors seek a safe haven for their portfolios in the United States.

3. Think about your own experience in the labor force.
   a. When you are looking for a part-time or full-time job, how many weeks does it typically take? After you find a job, how many weeks does it typically last?
   b. From your estimates, calculate (in a rate per week) your rate of job finding, \( f \), and your rate of job separation, \( s \). Note that if \( f \) is the rate of job finding, then the average spell of unemployment is \( 1/f \).
   c. What is the natural rate of unemployment for the population you represent?

4. Suppose an economy described by the Solow model is in a steady state with population growth \( n \) of 1.8 percent per year and technological progress \( g \) of 1.8 percent per year. Total output and total capital grow at 3.6 percent per year. Suppose further that the capital share of output is \( \frac{1}{3} \). If you used the growth-accounting equation to divide output growth into three sources – capital, labor, and total factor productivity – how much would you attribute to each source?

5. Narnia and Archenland both have the production function
   \[ Y = F(K, L) = K^{1/3}L^{2/3} \]
   a. Does this production function have constant returns to scale? Explain.
b. What is the per-worker production function $y = f(k)$?
c. Assume that neither country experiences population growth or technological progress and that 20 percent of capital depreciates each year. Assume further that Naria saves 10% of output each year and Archenland saves 30% of output each year. Using your answer from part b and the steady-state condition that investment equals depreciation, find the steady-state level of capital per worker for each country. Then find the steady-state level of income per worker and consumption per worker.
d. Suppose that both countries start off with a capital stock per worker of 1. What are the levels of income per worker and consumption per worker?
e. Remembering that the change in the capital stock is investment less depreciation, use a calculator or Excel to show how the capital stock per worker will evolve over time in both countries. For each year, calculate income per worker and consumption per worker. How many years will it be before the consumption in Archenland is higher than the consumption in Narnia?

6. The amount of education the typical person receives varies substantially among countries. Suppose that you compare Australia with a highly educated labor force and Vietnam with a less educated labor force. Assume that education affects only the level of efficiency of labor. Also assume that Australia and Vietnam are otherwise the same: they have the same savings rate, the same depreciation rate, the same population growth rate, and the same rate of technological progress. Both countries are described by the Solow model and are in their steady states. What would you predict for the following variables?
a. The rate of growth of total income
b. The level of income per worker
c. The real rental price of capital
d. The real wage

*Due Thursday 28 February*