ENVIRONMENT AND ECONOMIC DEVELOPMENT

ASSIGNMENT 3

Answers to this assignment are due back by Monday, January 16, 2017. You may work on this assignment alone or in pairs.

Question 1. Markov chains

Suppose that there are 150 countries, of which 20 are at war this year, and the Markov transition matrix is given by

$$
\begin{bmatrix}
0.992 & 0.008 \\
0.246 & 0.754
\end{bmatrix}
$$

where $0.008$ is the probability of a peaceful country descending into war, and $0.246$ is the probability of the war ending in a war-torn country. These proportions are more optimistic than those used by Collier.

a. How many countries are expected to be at war next year? Show your workings.

b. In steady state, how many countries are expected to be at war? Show your workings.

Question 2. Population Projections

Pick a less-developed country.

Forecast the country’s population through about 2050. Show your workings. Set out clearly, and justify, the assumptions you make about the evolution of fertility, mortality and migration. Compare your projections with those produced by the United Nations and indicate briefly what explains the differences between the two.

You will certainly want to set this up in a spreadsheet. Perhaps the best source of data is the UN Demographic Yearbook for 2011 (try http://unstats.un.org/unsd/demographic/products/dyb/dyb2015.htm for detailed data). The breakdown of the population data appears in Table 7, the fertility rates in Table 10, and the death rates in Table 19. You will need to set up a spreadsheet like the one we used to illustrate demographic momentum, but using 5-year intervals.