MGTECON 300, Spring 2021
Stanford Graduate School of Business
Professor Chad Jones

Assignment #1

Due on Canvas on
Sunday, April 11 at 11:59pm (pdf only)

You are welcome to work in groups (of up to 4 people) on the homework assignments in this course. Each group turns in *one PDF* file via Canvas. Please put all group members' names on the top of the first page of your submission. NOTE WELL: Unless submitting individually, you will need to join a Canvas group *before* submitting your solution. If you have any questions about groups, please email the Head TA, Rachel Schuh, at schuhr@stanford.edu.

Note: Some of these questions ask you to use the "Country Snapshots" data file. It can be downloaded from http://web.stanford.edu/~chadj/snapshots.pdf. Clicking on the "data" link on a country's page should open up a spreadsheet containing some data for that country. If this does not work, see the instructions at http://web.stanford.edu/~chadj/snapshots.html.

Column (C) of the spreadsheet reports per capita GDP in real 2017 U.S. dollars. That is, adjustments for inflation and for differences in prices across countries have already been made. (Notes on the data can be found starting on page 3 of the snapshots.pdf file.)

1. **The Macroeconomics of an Interesting Country.** Pick a country that you find interesting and learn some basic facts about its economy. Summarize these facts in a half-page of text and a few graphs. For this purpose, you may find the following resources to be helpful (click on the name in the PDF file for a hyperlink):

    - The IMF's World Economic Outlook (See the "Statistical Appendix" for a list of tables.)

    - The OECD Economic Outlook and their Statistics section

    - TradingEconomics.com

    - The CIA World Factbook

    - The "Country Snapshots" file mentioned above.

    Of course, feel free to take advantage of other resources as well. However, please be sure to reference your sources appropriately, including for data, statements of fact, and arguments or language.

2. **Plotting on a Ratio Scale.** Choose a different country from that selected in the previous exercise. Using the "Country Snapshots" data, plot real per capita GDP on two separate graphs: one using a "normal" (linear) scale and one using a ratio scale. Be sure to make both graphs readable and informative. Write a sentence or two about the behavior of the growth rate of per capita GDP based on what these graphs show. (Hint: Some computer programs refer to a "ratio scale" as a "logarithmic scale".)

3. **Calculating Growth Rates.** Using the "Country Snapshots" data, calculate the average annual growth rate of real per capita GDP between 1980 and 2019 (or the year for which data is last available) for China, India, and the United States. If the countries were to continue to grow

at these average rates into the future, approximately how many years would it take for their per capita GDPs to double?

4. **The Gift of the Dying.** Alwyn Young, an economist at the London School of Economics, has a recent paper in which he studies the macroeconomic consequences of the horrible tragedy of AIDS in sub-Saharan Africa. Answer the following questions, motivated by his research. (There is no need to read the article in order to complete this exercise.)

   (a) In the production function approach we studied in class, we noted that the wage rate is equal to the marginal product of labor. Write the mathematical expression of this statement. That is, write the wage as a function of capital, labor, and the TFP parameter.

   (b) Young estimates that AIDS may eventually kill 25 percent of the population in some of the poorest countries of the world. Assuming TFP and the amount of capital are unchanged by the epidemic, by how much would the wage rate change as a consequence of AIDS.

   (c) Discuss your result. Why does the wage rate change? Why is the effect larger or smaller in magnitude than 25 percent? In what sense is there a "gift of the dying," to use Young's evocative title?

   (d) In a paragraph or less, discuss any questions you may have regarding this result.