**JHU ECON 602:**

**MACROECONOMIC THEORY AND POLICY**

**(Fall 2022)**

**In-Class Group Problem Set on Convergence**

**(Oct. 25, 2022)**

To answer these question please use this data set from this link: [**https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020**](https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020)**.** The instructions below are based on the EXCEL version of the data set, which you can download from the link (the file is called mpd2020.xlsx).

1. Compute the annual growth rate of real per capita GDP (columns B to I) for the eight regions from 1820 to 2018. Use both the arithmetic definition ((YT – Y0)/ Y0)\*100 and the log difference (ln YT – ln Y0)\*100.
2. What is the evidence on β-convergence among incomes in the eight regions? To do this, show a graph which has the initial income (i.e. income in 1820 in this case) on the x-axis and the subsequent growth rate in annual incomes (i.e. between 2018 and 1820 in this case) on the y-axis. Then describe if you see a correlation and verify your impression by computing the correlation.

For the next question, use the data available at the tab ‘Full data’ in mpd2020.xlsx. You will also need the list of OECD countries and the dates on which they joined, available at this link: <https://www.oecd.org/about/document/ratification-oecd-convention.htm>

1. Provide evidence on β-convergence among incomes for the countries that were members of the OECD by 1965. Specifically, show a graph of the relationship between initial income (use 1965 as the year for the initial income) and subsequent growth rate in annual incomes (i.e. between 2018 and 1965). Compute the correlation coefficient. What does the evidence show?