Divergence, Big Time

Background

The range of output per worker across countries is large. According the Penn World Tables, real GDP per capita for the country at the 90th percentile was 44,923 international dollars (Denmark), while for the 10th percentile it was only 1,565 (Rwanda), a ratio of about 30 to 1. The very poorest countries have real GDP per capita around 600 to 700 international dollars (Burundi and Central African Republic), while the very richest have between 72,000 and 144,000 (Singapore and Qatar), for ratios of closer to 200 to 1. One of the grand questions of economic growth is what explains this divergence in output per capita.

If you go back in time, though, the divergence between countries *must* have been lower, which Pritchett (1997) points out. This is because countries GDP per person has been growing over time, meaning that it was lower in the past. In addition, there is lower bound to the level of real GDP per capita, which you might call subsistence consumption. The figure here shows Pritchett's logic, which is that if you go backwards far enough in time, the levels of real GDP per capita must *converge*.

Figure 1
Simulation of Divergence of Per Capita GDP, 1870–1985
(showing only selected countries)

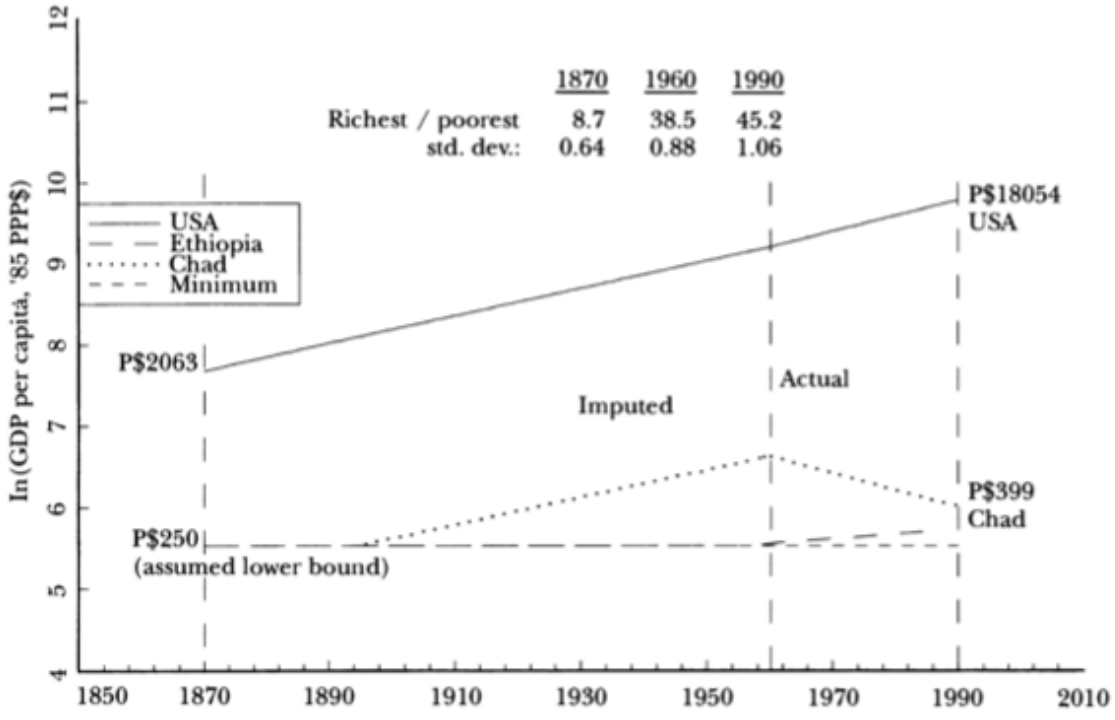

Figure 1: Divergence Must Have Been Lower in the Past

His point is that divergence has been growing over time, even though a number of developing countries (Korea, China, Malaysia, Taiwain, etc..) have made leaps towards rich country levels, meaning they have converged.

Project

The Solow model in the notes doesn't have a built-in mechanism to explain why divergence would be increasing over time. In particular, it does not have this limit that consumption cannot go below some minimum level, call it $\bar{c}$.

Write down a model of growth that incorporates a minimum level of consumption, which will imply that the savings rate is related to the level of output per worker. You should spell out all the underlying assumptions you are making about the economy (production function that firms use, whether factor markets are competitive, etc..).

With that model, you should be able to explain what creates divergence in levels of output per worker between different countries, and how that divergence rises over time.

Rules

You should work on this project alone. You will have to show me, either in written form or on the board, the model you set up, and explain to me how it works.