Growth: Problems

1. Set Country A's initial level of income as 2 and Country B's at 1. One way to solve this is to then assume that A doe not grow while B grows at 1%. Then $(1.01)^t = 2$, where t is the number of years. Solving, $t = 70$, confirming the "rule of 70."

2. If we are talking about real GDP, not per-capita, it should increase the growth rate because more people mean more labor. On a per-capita basis, we usually think fertility decreases output. A newborn contributes nothing to output but does increase the population. So each time a baby is born, per capita GDP fall (Damn, that's cold).

3. It is almost surely technological progress that has allowed any amount of capital and labor to be much more productive than before.

4. This is less obvious than #3. Personally, I would argue it is the quality of institutions, another component of A from our model. But you might reasonably argue that technological permeation or different savings rate might also explain much of the difference.

5. What are the effects on per capita capital, output, and consumption in the Solow Model if the savings rate decreases?

6. Now, the savings function lies on the horizontal axis. The only place where it intersects depreciation is at the origin. All variable equal zero, including consumption.

7. Now, the savings function lies on top of the production function. Because consumption is the gap between savings and output, it equals zero. Capital and output, however, are very high.

8. This makes the depreciation function flatter, recall that its slope equals d. It now intersects the savings function at a higher level of capital. Capital, consumption, and output each increase.

9. A lower savings rate reduce both capital and output while a lower depreciation rate has the opposite effect. So we cannot say. It depends. Avoid the temptation to say that there i no effect. There i no reason to believe that the positive and negative effects perfectly cancel each other out. Likewise because lower savings might reduce consumption, we also cannot say what happens to consumption.

10. There is no effect. Our model did not include the fertility rate. It can be added and we would see that higher fertility rates reduce each of the per-capita variables. But we excluded it in the name of simplicity.