

Population and Productivity Growth

Background

Over the *very* long run, there appears to be a positive relationship between population size and population growth. Kremer (1992) plotted the annual growth rate of the human population against the initial size of the human population, for selected years running from 1 million BCE to 1990. The earliest counts are obviously speculative, but he supports them with rough estimates made by anthropologists.

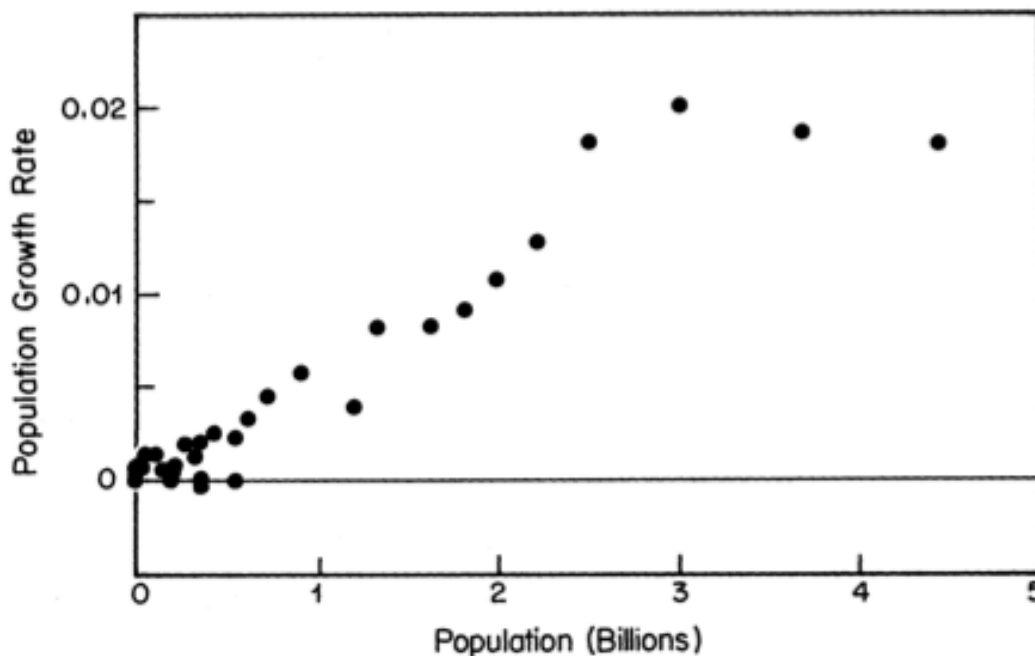


FIGURE I
Population Growth Versus Population

Figure 1: Population growth and population size

In this figure you can see the result, which is fairly clear positive correlation. When world population was less than 100 million (before 500 BCE), the growth rate of that population was between 3/10,000th of one percent per year, and about 1/10th of one percent per year. More recently, when world population was in the billions, the growth rate of world population reached 2% in the 1960's, and was around 1.8% per year in the 1950's, 1970's, and 1980's.

If one were to add data from the 2000's and 2010's, you'd see the relationship break down, as global population growth has dipped back towards 1% per year. Kremer's relationship is starting to break down.

Project

Write down a model of endogenous population growth and endogenous productivity that can replicate the positive relationship of population size and population growth.

Using that model, speculate on what could have changed in order to break the relationship between population size and population growth in the last few decades.

Rules

You can work on this alone, or with a small group (2-3 people). I'll evaluate the work of the group as a whole.