

From Ye Olde Stagnation to Modern Growth in England

Guillaume Vandenbroucke, Assistant Vice President and Economist

Modern economic growth—the sustained increase of real gross domestic product (real GDP) per capita—is a relatively recent phenomenon in world history. But what led an economy to transition from stagnation to modern growth? Population and land availability contributed to the shift, but in what ways?

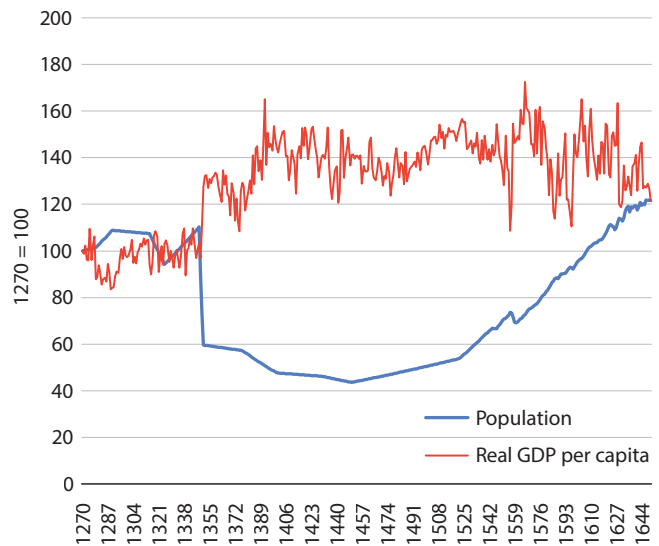
In this essay, I describe the “pre-modern growth period” of England’s history and its transition to modern growth. I document population and GDP trends surrounding the Black Death pandemic of the early 14th century and the role of technological progress, specifically in agriculture.

Figure 1 shows England’s population and real GDP per capita for 1270-1650. Both series are normalized to 100 in 1270 so that they can be shown on the same plot. A striking feature is the sudden decline in population, around 1350, caused by a pandemic of bubonic plague, the so-called Black Death.¹ While the plague spread throughout the area, real GDP per capita increased mechanically: Production did not change as fast as the population decline. Suddenly, there was similar output with fewer persons and, so, more output per person. Even though historians believe the plague ended in the early 1350s, population declined gradually until 1450. Thereafter, population increased again and reached its pre-Black Death level around 1600.

Another striking feature of this period is the stability of real GDP per capita after the Black Death ended. There is no clear trend and, in particular, no growth. Economic historians have long established that this “stagnation” was not specific to England but was a feature of the world’s economy as a whole for centuries.

The English economist Thomas Malthus (1766-1834) proposed a theory to explain the stagnation of real GDP per capita in the face of large, long-run changes in population: Technological discoveries and better practices, especially in agriculture, sometimes make it easier to provide food and other necessities of life. This causes populations to increase: Mortality decreases, and fertility may increase in response to better living conditions. Eventually, the increased population means there are fewer acres of land per person. In the end, GDP per capita could increase because of better technology or decrease because of less land per person. Which of these two effects dominates, if any, depends on the magnitude of technological progress

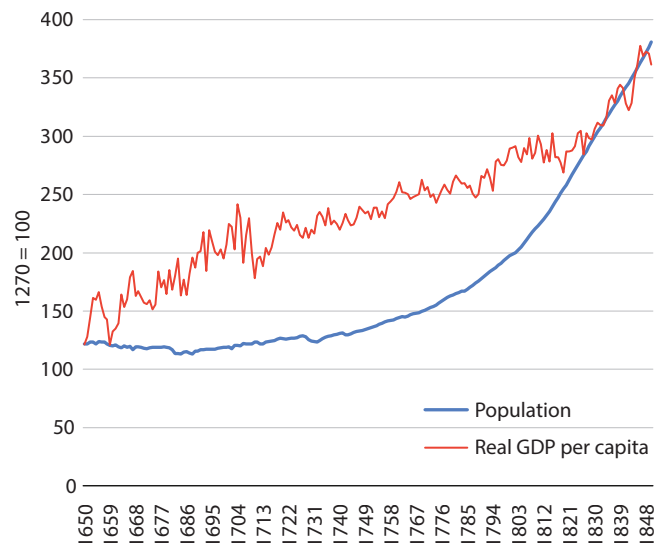
Figure 1
England’s Population and Real GDP Per Capita, 1270-1650



NOTE: Both series are normalized to 100 in 1270 so that they can be shown on the same plot.

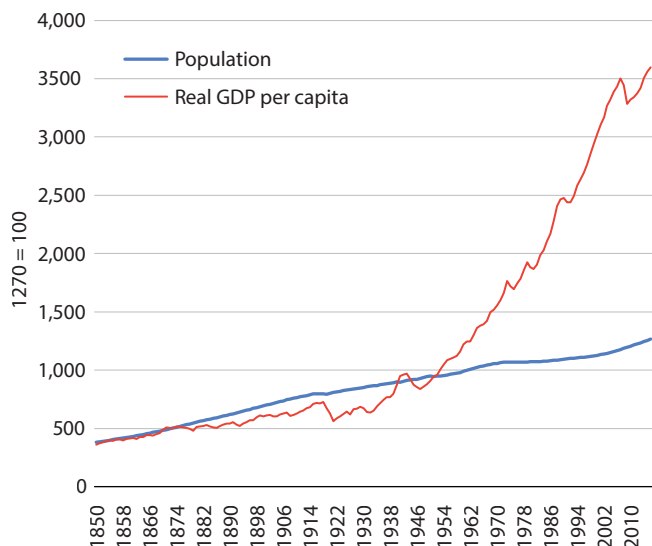
SOURCE: Bank of England.

Figure 2
England’s Population and Real GDP Per Capita, 1650-1850



SOURCE: Bank of England.

Figure 3
England's Population and Real GDP Per Capita, 1850-2016



SOURCE: Bank of England.

and the importance of land in production. If the two effects are of similar magnitude, GDP per capita remains constant while population increases, as shown in Figure 1.

Figure 1 extends to Figure 2 (1650-1850); but, instead of stagnating, real GDP per capita rises along with population. In the space of 200 years, both are multiplied by 3, which gives an average growth rate of 0.5% per year. Note that, initially, population grows at a slower pace than real GDP per capita. But, after approximately 1700, it grows faster.

Figure 3 (1850-2016) shows that economic and population growth continue but are significantly faster than that shown in Figure 2. First, real GDP per capita is multiplied by about 10 in the space of 166 years: That's an average growth rate of 1.4% per year instead of 0.5%. Second, the rate of population growth is 0.72% instead of 0.5%.

The Malthusian theory could, potentially, explain the transition from stagnation to modern growth, as displayed in Figures 1-3. But if one accepts this theory, instead of being exactly offset by the reduction of land per person (Figure 1), technological progress in agriculture would've had to have been fast enough to overcome this reduction. Such an explanation raises the following two questions: Where did the new technology come from? And why the continued emphasis on agriculture? A better theory must account for the declining importance of agriculture and the rising role of industry in modern economies.

One such theory is as follows: First, industrialization and the advent of machines (capital) make land less important in production. Second, ideas, scientific discoveries, and technological innovations are often embodied in new machines, and so capital is the vector through which technology affects the economy. Third, unlike land, machines can be built; and, therefore, when population increases, capital per person can remain constant or increase while land per person decreases. This eliminates the negative effect of land per person in the Malthusian theory. In sum, as England industrialized, it became possible for both population and GDP per capita to increase faster (Figures 2 and 3).

It is worth concluding with a word of caution: The discussion in this essay is theory describing the mechanics of the transition from stagnation to growth. The next question, unanswered here, is why did England industrialize at all? In other words, why did it have an Industrial Revolution? ■

Note

¹ The Black Death engulfed most of Europe, not just England. The first recorded occurrence of bubonic plague, caused by the same bacteria (*Yersinia pestis*), was during the Justinianic plague of the sixth century.