

Referee report: Entrepreneurship, knowledge, and the Industrial Revolution

This paper proposes a new interpretation of the Industrial Revolution through the lens of an endogenous growth model. Before the Industrial Revolution, no resources are invested for improving manufacturing productivity, because the return to this investment is too low. As exogenous technological improvements in agriculture lead to higher population growth, the mass of manufacturing entrepreneurs increases, and this increases the mass of general “knowledge” available in the economy. This, in turn, is assumed to increase the return to innovation investment. Once this return passes a critical threshold, entrepreneurs start investing in innovations which improve manufacturing productivity, and thereby put the economy on a higher growth path.

The paper tells an interesting story, and even though the model is quite involved, the main mechanisms are presented in a quite transparent way. Arguably, the model could even have been simplified much further while leaving the main message unchanged, at the cost of departing further from the Unified Growth Theory literature.

Main comments

1. The main shortcoming of the paper is that it hardly discusses alternative explanations of the Industrial Revolution. The author’s story is coherent and fits some empirical facts, but this does not tell the reader whether it is more convincing than the enormous amount of alternative explanations developed in the literature. For instance, it may be that the higher agricultural productivity lead to an increase in the demand for manufacturing goods, and that it was this higher demand (and not higher levels of knowledge), which gave entrepreneurs the incentive to invest in productivity improvements. Is there a way to tell

these two stories apart in the data? If not, can the author tell us more about why he thinks his explanation is more appropriate than the alternatives?

2. In the model, the accumulation of knowledge is a function of the mass of entrepreneurs. Given the author's definition of this variable as "new knowledge about natural phenomena underlying the production process", it is unclear whether it should really depend on entrepreneurs rather than, say, scientists. For the model, this is not a major problem. However, it is an issue when discussing why the Industrial Revolution took place in England. If general knowledge was the most important factor, one may as well argue that the Industrial Revolution should have occurred first in other countries (most notably France, the most advanced nation in Europe in the 17th and 18th centuries and the home country of the *Encyclopédie*, containing a summary of the most advanced knowledge about crafts and manufacturing at the time).
3. The model assumes that technological progress in agriculture is exogenous. As the Industrial Revolution is only made possible by the Agricultural Revolution, an interesting extension would be to study the latter more in detail, and see whether there was any role of economic incentives there as well.

Minor comments

1. The author talks about entrepreneurial profits, but technically speaking, they are zero, as production takes place with constant returns to scale under perfect competition. Entrepreneurs instead get a payment for the production factor (management) they supply.
2. Assumption (11) appears as an unnecessarily convoluted way to say that f is non decreasing. Furthermore, if the author would instead assume f were

increasing (which does not change anything in the interpretation), the inverse of f exists for sure and the whole discussion of this point in Corollary 1 can be avoided.