



Research Paper

Economic Growth on the Global Scale

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Stanislaw Gomulka, Economic Growth on the Global Scale

The conference organizers asked the panelists to formulate two key questions in their own field of study and to offer answers to these questions. Here are my two questions:

1. What are the reasons why, over the past two centuries, economic growth rates have been insensitive to economic policy in developed countries, yet highly sensitive to economic policy in “catching-up” countries?
2. What are the reasons for the rapid acceleration of economic growth witnessed by the now highly developed countries over the past two centuries, and their likely return to near-zero growth rates over the next two hundred years?

My answers to these questions as they relate to the past – more precisely to the last two hundred years – draw upon the empirical material gathered by the eminent economic historian Angus Maddison in his monumental work *Contours of the World Economy 1-2030 AD* (2007). The American economist Steve Hanke (2008) has described this work as a history of three “distinct epochs of economic growth: the Middle Ages 1000-1500, when the per capita GDP rose by 0.05% a year, the proto-capitalist epoch 1500-1820, when it grew by 0.07% a year,” i.e., still very slowly, “and the capitalist epoch, 1820-2000, when the rate of growth was 17 times higher than it was in the preceding epoch.” Under standard production-function assumptions, the long-term growth rate of per capita GDP serves as an index of the pace of qualitative change in the economy, such as technological innovation, workforce skills and institutional changes resulting from labor and capital inputs in sectors driving such qualitative change.

The rapid acceleration of economic growth in the early 19th century was limited to a relatively small part of the world economy, mainly Britain, the United States, parts of the Netherlands and Belgium, Germany and France. I refer to this part of the world economy as the Technology Frontier Area (TFA). By the latter half of the 19th century, this part had already covered vast areas of Germany and France, the Netherlands and Belgium, northern Italy and Japan. However, employment in this area remained a small fraction of global employment throughout the 19th century and the first half of the 20th. In contrast, there was little qualitative change in countries outside the TFA during this period. The technological gap between TFA and non-TFA countries was widening. This is a key fact about this approximately 150-year period.

Now I can address Question 1. From the perspective of qualitative changes, the entire TFA region was, and still is, essentially a single country. Therefore, trends in the pace of such changes, including per capita GDP growth rate, have been roughly the same in all the countries in this area over the past two centuries. Monetary and fiscal policies were able to influence – and indeed did influence – inflation levels, social transfers, and spending on war or national defense, but over this long period of about two centuries, they have had virtually no impact on the average per capita GDP growth rate. These average growth rates were not only essentially the same but also stable over time. These are additional key facts.

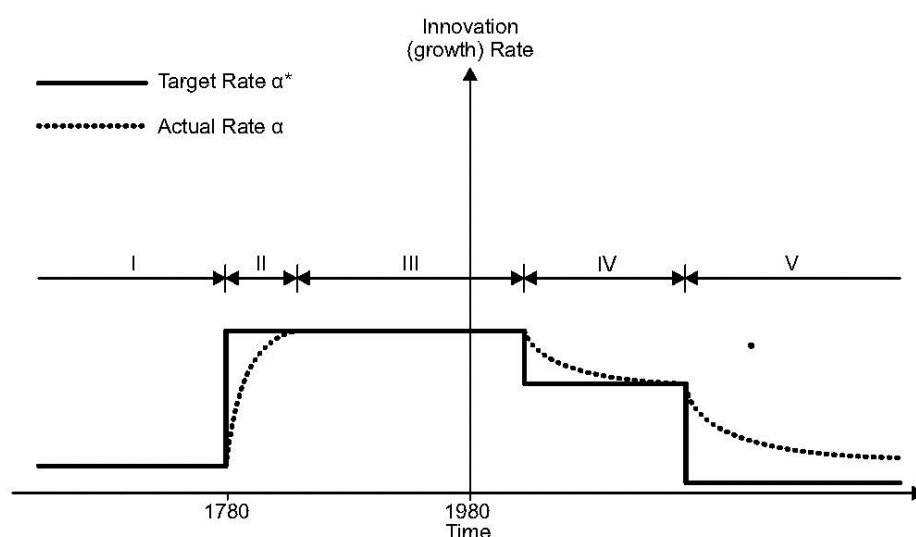
However, in the last approximately 50 years, significant changes have occurred in countries outside the TFA. These changes involve factors influencing not so much their own production of new innovations, which remains modest, but the flow of old and new technologies and other qualitative changes out of the TFA area. These factors primarily include investment relative to GDP, as well as public spending on education and pro-market institutional reforms. These factors vary widely among the countries outside the TFA. As a result of this significant policy diversity, there is also a strong divergence in per capita GDP growth rates, ranging from 0 to 10%. This has been yet another key difference between the TFA and non-TFA countries over the past fifty years or so.

Now, let me address Question 2. It deals with two issues, essentially making it two separate questions. I provide answers to both of them in my book *The Theory of Technological Change and Economic Growth* (Routledge, 1990) and articles: “The global economy in the 21st century: Will the trends of the 20th century continue?”, *Central European Economic Journal*, 2017, 2(49) and “A theory of global economic growth in the very long-run: Is a grand innovation slowdown inevitable?”, *Central European Economic Journal*, 2019, 6(53). Both articles are also reprinted in my recent book *The Global Economic Growth and the Economic Transformation of Poland and Eastern Europe*, Scholar Publishing House, 2023.

The first part of Question 2 is, “What are the reasons for the rapid acceleration of economic growth witnessed by the now highly developed countries over the past two centuries?” Capital investment and employment in the TFA area, in the sector that produces technological innovations and increases human capital, have grown at rates much higher than in the sector that produces conventional goods during this period. These high growth rates continue to be sustained by the expansion of the TFA area. Such high growth rates in investments in qualitative changes are the key reasons for the rapid economic growth seen in the TFA area, and ultimately also globally, over the past two centuries.

The second part of Question 2 concerns the reasons why the highly developed countries are likely to return to near-zero growth rates over the coming two hundred years. The first reason is the inevitable stabilization of the world's population, with many countries even set to see declines in population numbers. In China, a population decline of around 40% is expected in the latter half of this century. The second reason is the inevitable global decline in the growth rates of employment and capital in the sector of qualitative changes. In one of the mentioned articles above, I analyze the dynamics and consequences of these two declines.

If the theoretical prediction that I argued for in the first article (and prior to that in Chapter 10 in my 1990 book), regarding the likely return to nearly zero economic growth, proves to be empirically borne out over the next two centuries, then the “technological revolution” of the past two hundred years will have been part of a super-fluctuation spanning roughly four centuries. Over the coming two centuries, the catching-up process will lead to the gradual disappearance of the area outside the TFA. The TFA area will eventually become the global economy itself. Therefore, the per capita GDP growth rate in the TFA area is a key indicator of global economic growth during this fluctuation. In the aforementioned publications, I provide the following chart of this growth rate:



The target and actual innovation rates over time in the Technology Frontier Area (TFA). The dates and magnitudes are chosen for illustrative purposes

The Five Periods of the global innovation rate α , the growth rate of the world population n , the growth rate of employment in the global sector producing conventional goods n_1 , the growth rate of global capital in the sector producing qualitative changes, $n_1 + \alpha$, the growth rate of global employment in the sector producing qualitative changes, n_2 , the growth rate of global Gross Domestic Product per manhour, g :

- (I) n, n_1 and n_2 are all very low. So are α and g .
- (II) $(n_1, n_2) \gg n$ and n is high. The rates α and g are increasing.
- (III) $(n_1, n_2) \gg n$, but α and g are high and stable.
- (IV) $n_1 = n_2 = n$, but n is still high.
- (V) $n_1 = n_2 = n = 0$, α and g are declining.