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"Divergence in relative productivity levels and living standards is the dominant feature of modern economic history." [3] In particular, this article documents that, between 1870 and 1990, incomes in the developing world fell far behind those of the developed world in both relative and absolute terms. This finding emerges from an examination of each group of countries separately, then together. However the larger group, of less developed countries, is far from homogenous; marked divergences in income growth can be found within it as well as in comparison to those that have "arrived."

Convergence in Growth Rates of Developed Countries

Looking at the 17 "advanced capitalist countries (12 in Western Europe plus the US, Canada, Australia, New Zealand, and Japan) as a group, we can make three strong generalizations about their economic performance during the period under consideration. First, these countries experienced strong convergence in per capita incomes during this period. Second, while the poorer countries in this group grew faster than the richer, it is striking how narrow the range of growth rates were from 1870-1960. Finally, since 1870, there has been no acceleration of overall growth over time.

Evidence of convergence can be seen in the fact that the poorest six of the now-developed countries had five of the six fastest national growth rates from 1870-1960. Moreover, the richest five now-developed that were richest in 1870 experienced the five slowest growth rates during the same period. Nevertheless, the range of growth rates was very narrow: only from .9 (Australia) to 1.9 (Switzerland and Finland) During this period the standard deviation of average annual growth rates was only .33. The spread became much wider from 1960 to 1980, from New Zealand's 1.4 to Japan's impressive 6.3 annual per capita GDP growth. When the developed countries' average growth rate for 1980-1994 returned to the pre-1960 level of 1.5, the variance again narrowed.

We should not really be surprised to find convergence among the now-developed countries; indeed, it could be viewed as almost tautological. Countries that are now rich either started rich and grew slowly, or started poor and grew rapidly. The result is that those who have arrived at similar endpoints must have converged (at least not diverged) over time.

Comparing the Two Groups

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A very different picture emerges from a comparison between the group of 17 just mentioned and all the other countries.

Since historical data is harder to come by for the less developed nations, in order to make the comparison the author started by establishing, as a lower bound, the lowest GDP per capita that could have prevailed for a significant length of time in any of the places under consideration. Logic and available data are used to conclude that a 1985 purchasing power equivalent of $250 is the lowest that GDP per capita could have been in any country in 1870.
This figure can be defended on three grounds: first, no one has ever observed consistently lower living standards at any time or place in history; second, this level is well below extreme poverty levels of nutritional intake; and third, at a lower standard of living the population would be too unhealthy to expand. (7)

Starting with this assumption, along with the estimates of historical growth of developed nations and the current cross-national comparisons of income, it is easy to see that the two groups of countries, defined in terms of income, pulled apart over the period 1870-1990.

One way to illustrate this claim is to examine the ratio of the income of the 17 richest nations to all other nations. From 1870 to 1990 this ratio almost doubled, from 2.4 to 4.6.

It is also illuminating to compare the United States, the world's richest country, with the rest of the world. Per capita income in the U.S. grew about four-fold from 1870 to 1960. So any nation whose income was not four times higher in 1960 than in 1870 must have grown slower than the US. One-third of the nations of the world that offer data for 1960 had per capita incomes below $1,000. Therefore, if their incomes were at least $250 in 1870, they must have grown less than four-fold, or more slowly than the US. A more dramatic point emerges if we compare GDP per capita of the US to the average GDP per capita of all other countries. Over the 12 decades in question this absolute income gap grew by an order of magnitude, from $1, 286 to $12, 662.

Poverty Traps, Takeoffs, and Convergence

The countries lumped together as "other than" the 17 industrialized nations are a highly diverse group, in terms of both historical performance and current economic situations. While some countries have begun to experience strong and sustained growth rates, some continue toto have slower growth rates than the richest nations, and some have even experienced negative growth.

A standard can be set for "explosive growth" as the rate that would have taken a country from the lower bound in 1870 to the US level of per capita GDP in 1960. Such an achievement would require a 4.2 percent annual growth in per capita GDP. Among the advanced capitalist countries, even during their period of most rapid growth, only Japan exceeded this; while from 1960 to 1990 growth was faster than this standard in 11 "developing" nations, many in East Asia. However, 16 developing countries had negative growth over the same period, and 40 countries (more than a third of the sample) had growth rates of less than 1 percent per year.

In the 1960s Alexander Gerschenkron popularized the optimistic view that backwardness presented an opportunity for rapid catchup in technology and productivity. "However, the

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prevalence of absolute divergence implies that while there may be a potential advantage to backwardness, the cases in which backward countries, and especially the most backward of countries, actually gain significantly on the ladder are historically rare.” [15] A variety of forces appear to be present, under a variety of circumstances. Some countries have been able to realize explosive growth, but there are also forces for stagnation and for drastic social and economic decline. Overall, it appears that “[b]ackwardness seems to carry sever disadvantages.” [15] One of the most serious challenges to economics is that of overcoming the disadvantages of “being at the bottom.” Rather than deriving a single growth model, a unified theory of economic growth and development must address the questions:

> What accounts for continued per capita growth and technological progress of those leading countries at the frontier? What accounts for the few countries that are able to initiate and sustain periods of rapid growth in which they gain significantly on the leaders? What accounts for why some countries fade and lose the momentum of rapid growth? What accounts for why some countries remain in low growth for very long periods? [15]

Judging from the varieties of experience shown in this study, it seems that the appropriate growth policy will differ according to the situation. We cannot gain much from theories or policies for promoting growth that are insensitive to the distinctions between mature vs. booming economies, or between these and the countries that are still in the poverty trap.

Conclusion

This paper clearly documents the divergence in relative productivity levels and living standards in the modern era. Economists of the more optimistic variety have pointed to divergence as a source of hope. They claim that the poorer nations can leap frog many of the richer ones and experience period of rapid growth. However, the fact that there has been an absolute divergence shows that there have been very few examples of such rapid growth, especially among countries on the lower end of the income ladder. There is equally the possibility that rapid decline could incur instead. How to overcome the disadvantages of "being at the bottom" is one of the most serious challenges to economics.

More than revising conventional growth theory, in order for such a challenge to be met, four questions must be addressed: "What accounts for continued per capita growth and technological progress of those leading countries at the frontier? What accounts for the few countries that are able to initiate and sustain periods of rapid growth in which they gain significantly on the leaders? What accounts for why some countries fade and lose the momentum of rapid growth? What accounts for why some countries remain in low growth for very long periods? (15)"

Judging from the variations in experience shown in this study, rather than a universal approach, most policies should differ according to their respective situation. This would be a marked "divergence" from current notions of growth theory.

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